



Carly

REFRIGERATION & CLIMATE COMPONENTS SOLUTIONS

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CARLY equipment can only be installed by a Trade-approved technician
CARLY SAS - Share capital of 1.000.000 € - R.C.S. LYON B 959 500 257 00032 - Code APE 2825 Z



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Refrigeration & Climate Components Solutions

All our production facilities are located in Lissieu, near Lyons. Total manufacturing process control allows us to ensure perfect traceability and optimum quality level.

Confronted with the growing opacity of the goods specific origins, CARLY commits itself to offer its customers "Made in France" refrigerating components.

The location of our production unit, at the heart of Europe, offers an actual proximity thus ensuring customised, responsive service.

Created in 1923, CARLY designs, manufactures and markets a wide range of very high quality components for the refrigerating and air conditioning markets.

For many years, our partnerships with the most prestigious manufacturers, our agreements and exchanges with the best specialised distributors, our ongoing relationships with well-known professional refrigerating installers have helped us increase our experience in order to better serve the profession.

CARLY focuses its efforts in a very specific business area to which it is truly dedicated: refrigerating circuit components.

Research & Development, Production and Marketing investments are therefore targeted towards the line components activity.

This strong specialization has allowed CARLY to become an international reference and to offer its users one of the market's most comprehensive product lines.

Our technical teams are expert to deal with such different subjects as filtration, decontamination, noise annoyance, oil return management, maintenance of refrigeration systems.

As an international and independent company focusing on its customers, CARLY is a family owned company, which gives it a great adaptation capacity and a high reactivity on a more and more demanding market. Therefore, the company's management ensures that its teams focus on developing new solutions aimed at reacting to the evolution of a constantly changing environment. The company is certified ISO-9001 for quality and ISO-14001 for the environment.

With more than 60 % of its annual turn-over made on the international market, CARLY's activities follow a path of ongoing growth that enables the company to offer the actors of the refrigerating industry more and more efficient products and services.



ISO 9001:2008
ISO 14001:2004
Management
System

www.tuv.com
ID 9105077923



Warning

- The use of CARLY products requires that the buyer performs a prior technical validation more specifically as regards the following:
 - The design of the refrigerating circuit into which the product is integrated ;
 - Oils and refrigerants used ;
 - The installation operating conditions ;
 - The parameters of the installation : charge of the installation, pipes diameters, working pressures and temperatures...
- Indeed, the installation designers' responsibility is:
 - To make sure that all operating equipment items are fitted for their intended use and are compatible with each other ;
 - To ensure that temperature and pressure requirements of the installation are respected, in conformity with the technical features of the product, adding if necessary a safety valve (the integrator must provide a mean for the recovery of exhaust fumes, in conformity with the regulations in force) ;
 - To take the necessary measures in order to avoid liquid hammer ;
 - To ensure that the system works in an almost-static position.

For specific requirements (pressure, temperature), contact CARLY technical service.

- A complete evaluation of the risks must be performed during phases of design, assembling, and installation of the machine.
- As a component manufacturer, CARLY is not liable for coming up with general scope recommendations, and this applies to all types of installations.
Nevertheless, CARLY technical department is at the disposal of the buyer in order to answer their questions and guide them in their choices. But CARLY advices, especially about product selection (selection and technical details tables), are not liable and have no contractual aspect. Indeed, the quantity and the diversity of parameters in an installation and its working conditions are mostly unknown for CARLY, and do not allow a complete study that would enable to make detailed and specific answers.
- Each CARLY component should be carefully selected, in order to meet the requirements of the installation as specifically as possible. In order to do so, see the selection tables established for each family of CARLY components. The recommendations in these tables have been established for regular installations, without any specific requirements. For all other specific cases, it is imperative that you get in touch with CARLY's technical services, or your distributor's technical services.
- CARLY components are designed for use with CFCs, HCFCs, HFCs and CO₂ as well as with their associated oils and additives; these are non hazardous refrigerants from group 2 of the Pressure Equipment Directive 97/23/EC. CARLY components are not compatible with corrosive, toxic or inflammable substances (according to safety classification and information on refrigerants – Cf EN378-1 Appendix E). CARLY denies all responsibilities for damages subsequent to the use of said refrigerants. It is mandatory to use appropriated refrigerants (fluid or gas), in conformity with the indication on the label of the product.

For the use of CARLY components with refrigerants of group I, type hydrocarbons – Propane R290, Butane R600, Isobutane R600a, Propylene R1270, please contact CARLY technical service.

- CARLY recommends reading its general sales terms and especially the clauses concerning the warranty (report to chapter 117 of CARLY technical catalogue). These general sales terms govern the commercial relationships between CARLY and its customers. They are also detailed on the order confirmations, delivery notes and commercial invoices. They are available as well on request at CARLY company (info@carly-sa.com). Sending an order to CARLY implies the acceptance of its general sales terms without restriction, above any other general purchase conditions.
- CARLY components are designed only for thermodynamic installations (refrigeration, air conditioning, heat pumps...).
- CARLY products are in conformity with the European Pressure Equipment Directive (PED 97/23/CE). The products dedicated to be installed on a machine in the meaning of the machine directive 2006/42/CE and coming within category I as maximum (article 9, appendix II) are excluded of the scope of PED 97/23/CE (article 1§3).
- CARLY components are designed in order to be integrated into fix installations. For an integration into mobile installations (EN 378-2), it is the responsibility of the designer and/or manufacturer of the application to make sure of the right fitting of CARLY components into their application, making qualification tests of the components fitting into their application.
- The label on the products with the CE marking, must remain visible and must not be covered nor damaged.



Warning

- A close attention must be paid to intervention areas in order to get a safe and secured working area available.
- Only a skilled personal (EN 13313) trained and initiated to interventions on refrigeration installations and pressure equipment, and with the qualifications required by the regulation of the country of use, is authorized to install CARLY components (See General Assembling Precautions / Specific Procedures of the Technical Catalogue).
- Pressure equipments present some danger. During their handling, it is mandatory to take the necessary safety measures and to wear the individual protections according to the regulation in force.
- Plan a periodical control as often as necessary and in conformity with the regulation in force, of the installation air tightness and of the state of the refrigerant and the oil (moisture, acidity, dirt...) in order not to trouble the efficiency of the installation.
- In the frame of preventive maintenance, check regularly the general aspect and the state of the product, and replace it if necessary.
- It is mandatory to keep the instructions, during all the lifetime of the product.
- CARLY disclaims all responsibility regarding the possible errors and omissions present in the technical catalogues and brochures, or any other document distributed by CARLY.

CARLY keeps the right to modify its manufacturing without prior notice, which is valid for products already upon order, subject that these modifications do not modify the features defined with the customer.



European Pressure Equipment Directive 97/23/EC

PED

The European Pressure Equipment Directive 97/23/EC (called PED) aims at harmonizing the national clauses, specific to each member state, in order to enable free flow of equipment under pressure within the European Union.

The essential safety requirements under this directive only apply to risks linked to pressure.

The European Pressure Equipment Directive 97/23/EC applies to the design, the manufacturing, the conformity assessment of equipment and sets intended to contain refrigerants, gasses or liquids under pressure, which maximum working pressure is higher than 0.5 bar.

Equipment for which the European Pressure Equipment Directive 97/23/EC (article 3) applies can be the following:

- Receivers non subject to the action of flame or external heat intake;
- Piping;
- Safety accessories;
- Accessories under pressure;
- Sets (equipment under pressure assembled by a manufacturer and making up a functional unit).

→ APPLICATION TO CARLY PRODUCTS

CARLY products can be containers, piping or accessories under pressure.

■ Definitions - CE category

Equipments under pressure are classified in several CE categories according to their « pressure » risk. The risk category is determined in function of:

- The volume of the device;
- The kind of refrigerant / gas used;
- The maximal admissible pressure (PS).

There are 4 categories of CE risk: Categories I, II, III and IV (PED 97/23/CE, article 9, appendix 2)

Category I, II, III and IV equipment items are subject to the essential requirements such as defined in the Appendix 1 of the directive.

The sets are submitted to the requirements of Appendix A, when they include at least one equipment of category I, safety accessories excluded.

The equipments that cannot be classified into one of the 4 categories are excluded from the scope of application of the Directive requirements (article 3§3). So they do not have CE marking.

Nota:

The products dedicated to be installed on a machine in the meaning of the machine directive 2006/42/CE and coming within category I as maximum (article 9, appendix II) are excluded of the scope of PED 97/23/CE (article 1§3).

■ Definitions - Technical features

- **Pressure:** Pressure with reference to atmospheric pressure (pression relative).
- **Maximum working pressure (PS):** Maximum pressure for which the equipment was designed.
- **Maximal admissible pressure in low temperature (PS BT)*:** Maximal admissible pressure in « low temperature » for which the equipment has been designed.
- **Test pressure (PT):** hydraulic test pressure of containers**.
- **Working temperatures (TS mini / maxi):** Minimal and maximal temperatures for which the equipment is designed.
- **Working temperatures (TS BT)*:** Minimal admissible working temperature for which the equipment is designed, with a pressure limit.



European Pressure Equipment Directive 97/23/EC

PED

■ Definitions - Technical features

- **Volume (V):** Internal volume for each container including the volume of the connections up to the first connection, not including the volume of permanent internal elements.
- **Nominal size (DN):** Numerical designation common to all the elements of a piping system other than the elements referenced by their outside diameter or by their thread size.
- **Nature of refrigerant contained:** Liquid or gas, hazardous or non-hazardous.

The technical features of each product (PS/PS BT, V/DN, TS mini/maxi, TSBT, PT) are indicated in the “Technical features” table in each chapter of the technical documentation.

For each product, a description sheet can be obtained from CARLY technical services on request; it certifies each product features.

→ APPLICATION TO CARLY PRODUCTS

The refrigerants chosen by CARLY are Group 2 gases, Refrigerants classified as non hazardous according to PED 97/23/CE (article 9).

To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.

* **Pressure Limit for Low Temperatures :**

- *If the PS BT and TS BT values are defined, then for a working temperature between the min. TS and TS BT values, the product's maximum working pressure is limited to the PS BT value.*
- *The PS BT and TS BT values for each Product are indicated in the “Technical features» table in each chapter of the Technical Documentation.*

** **Hydraulic test by sampling for products of CAT.I / for each unit for products of CAT.II and over.**

■ Evaluation of product conformity

In order to be able to market products with “CE” marking, products of category I, II & III are submitted to a conformity evaluation procedure (cf appendix 3) in function of the category of the equipment (article 10).

Conformity evaluation procedures for CARLY products of:

- Cat I: Module A;
- Cat II: Module D1;
- Cat III: Module B1 + D.

■ CE marking

CE marking is printed on each product and shows the following information:

- CE marking*;
- Manufacturer's name and address;
- Year of manufacture;
- Product reference;
- Manufacturing batch identification;
- The product technical features (PS, V/DN, max. TS, min. TS, PT);
- Refrigerant families to be used.

* For CE category II, III and IV products, the notified organisation identification number is printed next to the CE marking - For CARLY, this number is N° 0036 (TÜV SÜD Industrie Service GmbH).

No CE marking is printed on article 3§3 products as they are excluded from the Pressure Equipment Directive.



European Pressure Equipment Directive 97/23/EC

PED

■ CE declaration of conformity

The CE conformity statement is printed by the manufacturer and certifies that the product concerned matches the requirements of the European Pressure Equipment Directive 97/23/EC in terms of design, manufacturing and conformity assessment (final test).

→ APPLICATION TO CARLY PRODUCTS

CE CATEGORY I PRODUCTS

The CE conformity statement is not linked to manufacturing batch but to product design.

The original is kept by CARLY.

A copy can be obtained from CARLY technical services on request or for « catalogue » products it is possible to download it from our website www.carly-sa.com.

CE CATEGORY II PRODUCTS

A CE conformity statement is printed for each manufacturing batch.

The original is kept by CARLY; a copy is enclosed in each product's packing.

CE CATEGORY III PRODUCTS

A CE conformity statement is printed for each manufacturing batch.

The original is kept by CARLY; a copy is enclosed in each product's packing.

ARTICLE 3§3 PRODUCTS (WITHOUT CE CATEGORY)

The conformity declaration is not linked to the manufacturing lot. The original is kept by CARLY. A copy is available upon request at CARLY technical service, or for "catalogue" products, it is possible to download it from our website: www.carly-sa.com.

■ CE Instruction Notice

The CE Instruction Notice should catch the reader's attention on the dangers linked to erroneous use and contain all information dealing with the assembly, commissioning, operation and maintenance of the product concerned.

It also indicates the product features (CE Category retained, PS, V/DN, max. TS, min. TS,...), and also the main recommendations for mounting / assembling the products.

→ APPLICATION TO CARLY PRODUCTS

CE CATEGORY I PRODUCTS

For each product, a CE instruction notice can be obtained from CARLY technical services on request.

CE CATEGORY II PRODUCTS

A CE instruction notice is enclosed in each product packing.

CE CATEGORY III PRODUCTS

A CE instruction notice is enclosed in each product packing.

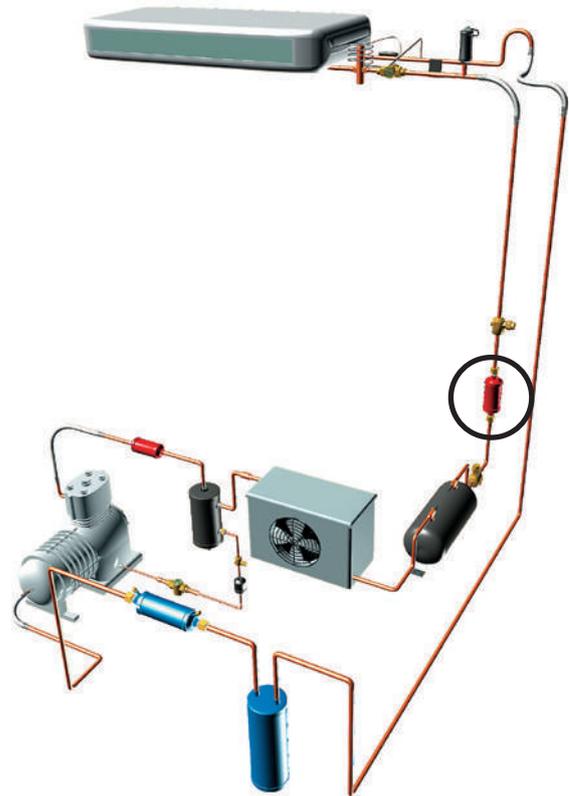


Anti-acid filter driers

→ DCY

■ Applications

- Filtering and drying of refrigerants and acid neutralization for liquid lines of refrigerating and air conditioning installations.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is done with the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- No desorption, even at a high temperature.
- Several types of connections are possible on standard products:
 - To be screwed type SAE
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimeters (MMS)



Possible customization on demand:

- Specific connections (O-RING, ORFS, ...)
- Aluminium casings and unions (weight optimisation)
- Stainless steel casings and unions (resistance to corrosion and at low temperatures)
- Connections to braze, 100 % copper

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Great drying and acid neutralization capacity at all temperatures, thanks to a rigorous selection and a judicious mix of the chemical agents present in the filter driers (activated alumina in order to neutralise the acids and molecular sieves to adsorb moisture); the volume of free-grains drying agents used in a CARLY filter drier is greater than that present in an equivalent model with a solid core.
- Initial drying capacity guaranteed by a 200 °C oven drying and airtight sealing.
- Drying ensured for the subcritical CO₂ applications at low temperatures.
- Filter driers sizes that ensure interchangeability with most products of the market.
- A dispenser located at the inlet ensures optimal distribution and permanent treatment of the whole refrigerant, inside the filter drier.
- The copper-plated steel connections up to a diameter of 3/4" - 18 mm facilitate the brazing and allow using brazing alloys with a low silver percentage.
- Installation possible in all positions.
- GOST certified products.



Anti-acid filter driers

→ DCY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to DCY filter driers

- Filter driers are to be mounted on the liquid line between the receiver and the expansion element.
- The refrigerant flow direction is indicated by an "IN" mark in the inlet shell of the filter drier and by an arrow on the filter drier tag. It must be necessarily respected.
- We recommend the vertical mounting of the filter drier with a top-down fluid flow direction in order to favour its filling when in operation and a rapid flow of the fluid when the installation is shut down.
- We recommend the use of a brasing at 10 % silver minimum for the brasing of the copper coated silver unions.
- Be careful to properly select the solenoid valves located downstream of the filter driers; their over-sizing could cause liquid hammer phenomena hindering the filter driers' mechanical behaviour; protection of regulation elements located upstream of the evaporator should be performed with FILTRY dirt filters (refer

to chapter 11); these liquid hammer phenomena can originate from other sources, in longpiping installations.

- Never install the filter driers in an area of the circuit that can be isolated.
- Never trap the refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- The filter driers must be changed :
 - after each intervention on the installation requiring the opening of the circuit
 - when the liquid indicator (VCYL or VCYLS) indicates an abnormal humidity content
 - when the pressure loss measured in the dewatering filter is too high
 - at least once a year as a measure of precaution
- A dewatering filter saturated in humidity no longer retains the water molecules which circulate then in the circuit ; these molecules in contact with other materials and with the POE oils which are very

hydrophilic are liable to form acids which can be fatal for the installation ; therefore, it is very important to use dewatering filters containing activated alumina in order to neutralise as rapidly as possible the acids present in the circuit and not filter driers with only 100 % of a molecular screen.

- Filter drier efficiency and refrigerant moisture content should be checked using VCYL or VCYLS liquid sight glasses (refer to chapters 9 or 10).
- Make sure that the piping can support without deformation the weight of the filter drier ; otherwise, plan the attachment of the dewatering filter with a clamp on a stable part of the installation.



Anti-acid filter driers

→ DCY

■ Selection table

CARLY references	Connections		CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾					Dehydratable refrigerant capacity kg of refrigerant ⁽²⁾						
	To screw SAE inch	To solder ODF inch			R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽³⁾	R22 R407C R407F		R134a R410A		R404A R507		R744 CO ₂
										24 °C	52 °C	24 °C	52 °C	24 °C	52 °C	24 °C
DCY 032	1/4				8,0	7,7	5,5	8,2	9,0	6,5	5,5	7,0	6,0	6,5	5,5	3,9
DCY 032 S		1/4	DCY 032 MMS	6	8,0	7,7	5,5	8,2	9,0	6,5	5,5	7,0	6,0	6,5	5,5	3,9
DCY 033	3/8				22,0	20,0	15,5	22,5	24,6	6,5	5,5	7,0	6,0	6,5	5,5	3,9
DCY 033 S		3/8	DCY 033 MMS	10	22,0	20,0	15,5	22,5	24,6	6,5	5,5	7,0	6,0	6,5	5,5	3,9
DCY 052	1/4				8,5	8,0	6,0	8,5	9,5	9,5	9,0	11,5	10,0	9,5	8,0	5,8
DCY 052 S		1/4	DCY 052 MMS	6	8,5	8,0	6,0	8,5	9,5	9,5	9,0	11,5	10,0	9,5	8,0	5,8
DCY 053	3/8				23,0	22,0	16,0	23,5	25,8	9,5	9,0	11,5	10,0	9,5	8,0	5,8
DCY 053 S		3/8	DCY 053 MMS	10	23,0	22,0	16,0	23,5	25,8	9,5	9,0	11,5	10,0	9,5	8,0	5,8
DCY 082	1/4				9,0	8,5	6,5	9,0	10,1	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DCY 082 S		1/4	DCY 082 MMS	6	9,0	8,5	6,5	9,0	10,1	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DCY 083	3/8				24,0	23,0	17,0	24,5	26,9	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DCY 083 S		3/8	DCY 083 MMS	10	24,0	23,0	17,0	24,5	26,9	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DCY 084	1/2				38,0	37,0	30,0	39,5	42,6	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DCY 084 S		1/2	DCY 084 MMS	12	38,0	37,0	30,0	39,5	42,6	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DCY 162	1/4				9,0	8,5	6,5	9,0	10,1	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY 162 S		1/4	DCY 162 MMS	6	9,0	8,5	6,5	9,0	10,1	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY 163	3/8				24,5	24,0	18,0	25,0	27,4	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY 163 S		3/8	DCY 163 MMS	10	24,5	24,0	18,0	25,0	27,4	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY 164	1/2				41,5	40,0	32,0	43,0	46,5	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY 164 S		1/2	DCY 164 MMS	12	41,5	40,0	32,0	43,0	46,5	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY 165	5/8				68,0	66,0	50,0	70,0	76,2	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY 165 S/MMS		5/8	DCY 165 S/MMS	16	68,0	66,0	50,0	70,0	76,2	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY 302	1/4				9,0	8,5	6,5	9,0	10,1	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 303	3/8				25,0	24,5	18,0	26,0	28,0	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 303 S		3/8	DCY 303 MMS	10	25,0	24,5	18,0	26,0	28,0	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 304	1/2				45,0	42,0	34,0	46,0	50,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 304 S		1/2	DCY 304 MMS	12	45,0	42,0	34,0	46,0	50,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 305	5/8				70,0	68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 305 S/MMS		5/8	DCY 305 S/MMS	16	70,0	68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 307 S/MMS		7/8	DCY 307 S/MMS	22	110,0	105,0	80,0	115,0	123,2	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 414	1/2				46,0	44,0	36,0	47,0	51,5	114,0	102,5	130,0	112,0	108,0	95,0	69,2
DCY 415	5/8				72,0	70,0	52,0	74,0	80,6	114,0	102,5	130,0	112,0	108,0	95,0	69,2
DCY 415 S/MMS		5/8	DCY 415 S/MMS	16	72,0	70,0	52,0	74,0	80,6	114,0	102,5	130,0	112,0	108,0	95,0	69,2
DCY 417 S/MMS		7/8	DCY 417 S/MMS	22	122,0	118,0	85,0	125,0	136,6	114,0	102,5	130,0	112,0	108,0	95,0	69,2
DCY 755	5/8				75,0	73,0	55,0	77,0	84,0	168,0	147,0	179,0	155,0	159,0	134,0	102,0
DCY 756	3/4 BSP				93,0	91,0	65,0	95,0	104,2	168,0	147,0	179,0	155,0	159,0	134,0	102,0
DCY 756 S		3/4	DCY 756 MMS	18	93,0	91,0	65,0	95,0	104,2	168,0	147,0	179,0	155,0	159,0	134,0	102,0
DCY 967 S/MMS		7/8	DCY 967 S/MMS	22	125,0	123,0	91,0	135,0	140,0	168,0	147,0	179,0	155,0	159,0	134,0	102,0
DCY 969 S		1 1/8	DCY 969 MMS	28	126,0	128,0	92,0	148,0	141,1	168,0	147,0	179,0	155,0	159,0	134,0	102,0

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for To = -15 °C, Tk = 30 °C and Δp = 0.07 bar. If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86.

⁽³⁾ Refrigerating capacities Qn for Tk = -10 °C and To = -40 °C

For Tk = 0 °C Qo = Qn + 12 %, For To = -30 °C Qo = Qn - 2 %, For To = -20 °C Qo = Qn - 6 %

For Tk = -20 °C Qo = Qn - 10 %, For To = -20 °C Qo = Qn - 6 %

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



Anti-acid filter driers

→ DCY

■ Example of selection of a DCY anti-acid filter drier

The sizing of a product implies that the buyer takes into account the conditions under which the product is going to be used (temperature - pressure - refrigerant - oil - external environment). The values proposed in the CARLY catalogue selection tables match specific test conditions.

In order to define a correct sizing, we suggest that you convert your operating data into data that match the CARLY selection tables.

- Installation operating with R404A under the following conditions⁽¹⁾ :
 - To = - 20 °C
 - Tk = 35 °C
 - Q_ox = 46 kW
 - 69 kg of refrigerant at 24 °C
- Which DCY anti-acid filter drier to choose?

DCY selection

- Conversion of installation capacity to match the conditions of Standard ARI 710-86.
Refer to the table of correction factors in chapter 112 – liquid line – R 404A: fct = 1.10

$$Q_{o}x \times fct = Q_{o}ARI$$

$$Q_{o}ARI = 46 \times 1,10 = 50,6 \text{ i.e } 51 \text{ kW}$$

- DCY type selection and reading of selection table on page 1.3
 - R 404A
 - 69 kg refrigerant at 24 °C
 - Q_oARI = 51 kW

Filter drier volume selection depends on the installation total refrigerant capacity. For a quantity of 69 kg of R404A, selection should be done from the DCY 300 product line. See dehydratable refrigerant capacity column.

Selection of the connection, hence of the filter drier, is performed by carrying the Q_oARI refrigerating capacity and the refrigerant over to the refrigerating capacity column.

Result: DCY 305 S/MMS (connections to solder) or DCY 305 (connections to screw)

If the Q_oARI value is between two CARLY filter drier types in the selection table, it is recommended to select the filter drier with the greater capacity.

CARLY references	Connections		CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾					Dehydratable refrigerant capacity kg of refrigerant ⁽²⁾						
	To screw SAE inch	To solder ODF inch			R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂	R22 R407C R407F		R134a R410A		R404A R507		R744 CO ₂
										24 °C	52 °C	24 °C	52 °C	24 °C	52 °C	
DCY 304	1/2				45,0	42,0	34,0	46,0	50,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 304 S		1/2	DCY 304 MMS	12	45,0	42,0	34,0	46,0	50,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 305	5/8				70,0	68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY 305 S/MMS		5/8	DCY 305 S/MMS	16	70,0	68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5

⁽¹⁾ Chapter "Abbreviations and units" (refer to chapter 113).

⁽²⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86.



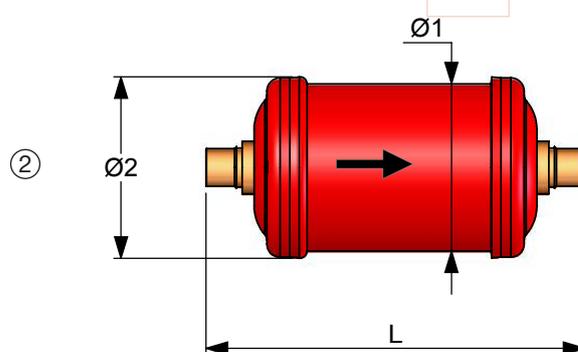
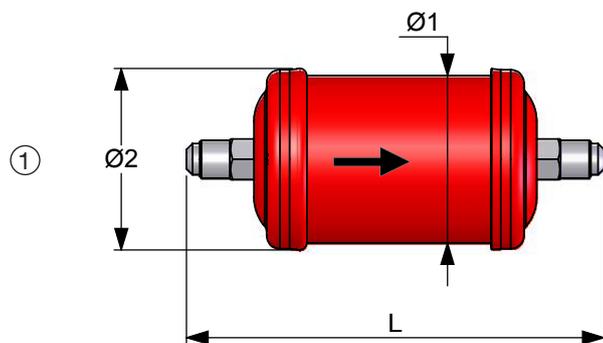
Anti-acid filter driers

→ DCY

■ Technical features

CARLY references	Connections types ⁽¹⁾	Drawing Nb	Filtering surface cm ²	Volume of desiccation products cm ³	Dimensions		
					Ø1 mm	Ø2 mm	L mm
DCY 032		1	52	59	50	55	109
DCY 032 S	DCY 032 MMS	2	52	59	50	55	99
DCY 033		1	52	59	50	55	115
DCY 033 S	DCY 033 MMS	2	52	59	50	55	99
DCY 052		1	52	82	50	55	122
DCY 052 S	DCY 052 MMS	2	52	82	50	55	112
DCY 053		1	52	82	50	55	128
DCY 053 S	DCY 053 MMS	2	52	82	50	55	112
DCY 082		1	52	130	50	55	150
DCY 082 S	DCY 082 MMS	2	52	130	50	55	140
DCY 083		1	52	130	50	55	156
DCY 083 S	DCY 083 MMS	2	52	130	50	55	140
DCY 084		1	52	130	50	55	160
DCY 084 S	DCY 084 MMS	2	52	130	50	55	140
DCY 162		1	102	322	70	76	169
DCY 162 S	DCY 162 MMS	2	102	322	70	76	159
DCY 163		1	102	322	70	76	175
DCY 163 S	DCY 163 MMS	2	102	322	70	76	159
DCY 164		1	102	322	70	76	180
DCY 164 S	DCY 164 MMS	2	102	322	70	76	159
DCY 165		1	102	322	70	76	184
DCY 165 S/MMS	DCY 165 S/MMS	2	102	322	70	76	163

⁽¹⁾ Chapter "Connection features and drawings" (refer to chapter 114).





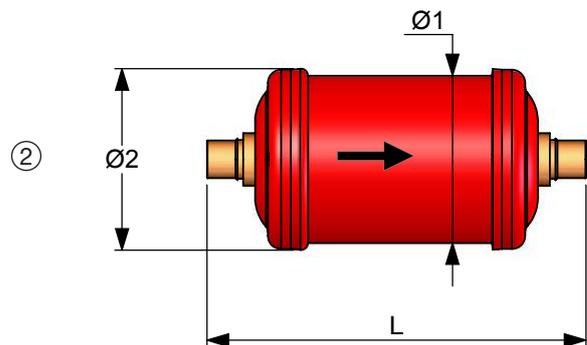
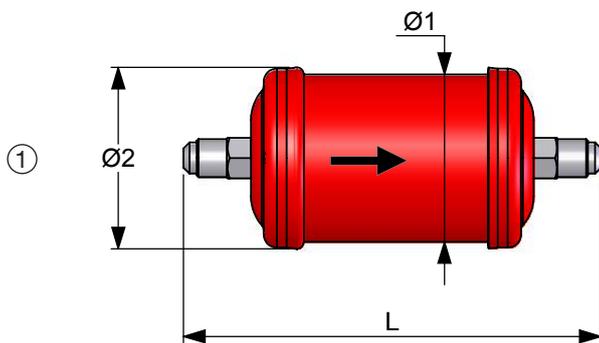
Anti-acid filter driers

→ DCY

■ Technical features

CARLY references	Connections types ⁽¹⁾	Drawing Nb	Filtering surface cm ²	Volume of desiccation products cm ³	Dimensions		
					Ø1 mm	Ø2 mm	L mm
DCY 302	1	1	102	582	70	76	246
DCY 303	1	1	102	582	70	76	252
DCY 303 S	DCY 303 MMS	2	102	582	70	76	236
DCY 304	1	1	102	582	70	76	256
DCY 304 S	DCY 304 MMS	2	102	582	70	76	236
DCY 305	1	1	102	582	70	76	260
DCY 305 S/MMS	DCY 305 S/MMS	2	102	582	70	76	240
DCY 307 S/MMS	DCY 307 S/MMS	2	102	582	70	76	260
DCY 414	1	1	170	936	89	96	255
DCY 415	1	1	170	987	89	96	268
DCY 415 S/MMS	DCY 415 S/MMS	2	170	987	89	96	248
DCY 417 S/MMS	DCY 417 S/MMS	2	170	1060	89	96	281
DCY 755	1	1	170	1327	89	96	328
DCY 756	1	1	170	1327	89	96	336
DCY 756 S	DCY 756 MMS	2	170	1327	89	96	314
DCY 967 S/MMS	DCY 967 S/MMS	2	170	1327	89	96	328
DCY 969 S	DCY 969 MMS	3	170	1327	89	96	338

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).





Anti-acid filter driers

→ DCY

■ Technical features

CARLY references		Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
DCY 032		0,10	46	15	100	-40	-30	Art3§3
DCY 032 S	DCY 032 MMS	0,10	46	15	100	-40	-30	Art3§3
DCY 033		0,10	46	15	100	-40	-30	Art3§3
DCY 033 S	DCY 033 MMS	0,10	46	15	100	-40	-30	Art3§3
DCY 052		0,12	46	15	100	-40	-30	Art3§3
DCY 052 S	DCY 052 MMS	0,12	46	15	100	-40	-30	Art3§3
DCY 053		0,12	46	15	100	-40	-30	Art3§3
DCY 053 S	DCY 053 MMS	0,12	46	15	100	-40	-30	Art3§3
DCY 082		0,16	46	15	100	-40	-30	Art3§3
DCY 082 S	DCY 082 MMS	0,16	46	15	100	-40	-30	Art3§3
DCY 083		0,17	46	15	100	-40	-30	Art3§3
DCY 083 S	DCY 083 MMS	0,17	46	15	100	-40	-30	Art3§3
DCY 084		0,17	46	15	100	-40	-30	Art3§3
DCY 084 S	DCY 084 MMS	0,17	46	15	100	-40	-30	Art3§3
DCY 162		0,39	46	15	100	-40	-30	Art3§3
DCY 162 S	DCY 162 MMS	0,39	46	15	100	-40	-30	Art3§3
DCY 163		0,40	46	15	100	-40	-30	Art3§3
DCY 163 S	DCY 163 MMS	0,40	46	15	100	-40	-30	Art3§3
DCY 164		0,42	46	15	100	-40	-30	Art3§3
DCY 164 S	DCY 164 MMS	0,42	46	15	100	-40	-30	Art3§3
DCY 165		0,42	46	15	100	-40	-30	Art3§3
DCY 165 S/MMS	DCY 165 S/MMS	0,42	46	15	100	-40	-30	Art3§3
DCY 302		0,65	46	15	100	-40	-30	Art3§3
DCY 303		0,66	46	15	100	-40	-30	Art3§3
DCY 303 S	DCY 303 MMS	0,66	46	15	100	-40	-30	Art3§3
DCY 304		0,67	46	15	100	-40	-30	Art3§3
DCY 304 S	DCY 304 MMS	0,67	46	15	100	-40	-30	Art3§3
DCY 305		0,68	46	15	100	-40	-30	Art3§3
DCY 305 S/MMS	DCY 305 S/MMS	0,68	46	15	100	-40	-30	Art3§3
DCY 307 S/MMS	DCY 307 S/MMS	0,68	46	15	100	-40	-30	Art3§3
DCY 414		1,09	46	15	100	-40	-30	I
DCY 415		1,14	46	15	100	-40	-30	I
DCY 415 S/MMS	DCY 415 S/MMS	1,14	46	15	100	-40	-30	I
DCY 417 S/MMS	DCY 417 S/MMS	1,22	46	15	100	-40	-30	I
DCY 755		1,48	46	15	100	-40	-30	I
DCY 756		1,48	46	15	100	-40	-30	I
DCY 756 S	DCY 756 MMS	1,48	46	15	100	-40	-30	I
DCY 967 S/MMS	DCY 967 S/MMS	1,49	46	15	100	-40	-30	I
DCY 969 S	DCY 969 MMS	1,49	46	15	100	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to Chapter 0).



Anti-acid filter driers

→ DCY

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DCY 032	0,33	0,30	24
DCY 032 S & MMS	0,33	0,30	24
DCY 033	0,33	0,30	24
DCY 033 S & MMS	0,33	0,30	24
DCY 052	0,38	0,35	24
DCY 052 S & MMS	0,38	0,35	24
DCY 053	0,38	0,35	24
DCY 053 S & MMS	0,38	0,35	24
DCY 082	0,41	0,40	24
DCY 082 S & MMS	0,43	0,40	24
DCY 083	0,43	0,40	24
DCY 083 S & MMS	0,40	0,35	24
DCY 084	0,48	0,45	24
DCY 084 S & MMS	0,48	0,45	24
DCY 162	0,94	0,90	16
DCY 162 S & MMS	0,94	0,90	16
DCY 163	0,94	0,90	16
DCY 163 S & MMS	0,94	0,90	16
DCY 164	0,99	0,95	16
DCY 164 S & MMS	0,99	0,95	16
DCY 165	1,04	1,00	16
DCY 165 S/MMS	1,04	1,00	16

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DCY 302	1,42	1,35	12
DCY 303	1,42	1,35	12
DCY 303 S & MMS	1,42	1,35	12
DCY 304	1,47	1,40	12
DCY 304 S & MMS	1,47	1,40	12
DCY 305	1,57	1,50	12
DCY 305 S/MMS	1,57	1,50	12
DCY 307 S/MMS	1,62	1,55	12
DCY 414	2,18	2,10	6
DCY 415	2,28	2,20	6
DCY 415 S/MMS	2,28	2,20	6
DCY 417 S/MMS	2,33	2,25	6
DCY 755	2,78	2,70	6
DCY 756	2,78	2,70	6
DCY 756 S & MMS	2,78	2,70	6
DCY 967 S/MMS	2,83	2,75	6
DCY 969 S & MMS	2,93	2,85	6



Anti-acid filter driers

→ DCY-P6 / 64 bar (928 psig)

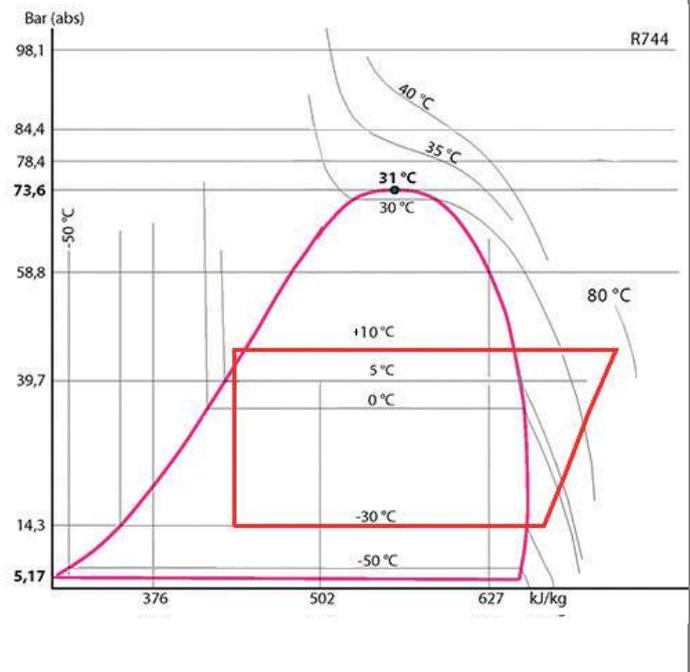
■ Applications

- Filtering and drying of refrigerants and acid neutralization for liquid lines of refrigerating and air conditioning installations, running with high working pressures.



64 bar

CO₂ SUBCRITICAL



■ Functional features

- Products are compatible with HFC and CO₂, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is done with the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- No desorption, even at a high temperature.
- Several types of connections are possible on standard products:
 - To be screwed type SAE
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimeters (MMS)



Possible customization on demand:

- Specific connections (O-RING, ORFS, ...)
- Stainless steel casings and unions (resistance to corrosion and at low temperatures).

■ CARLY advantages

- Maximal working pressure: up to 64 bar with CO₂ in subcritical compression systems.
- Great drying and acid neutralization capacity at all temperatures, thanks to a rigorous selection and a judicious mix of the chemical agents present in the filter driers (activated alumina in order to neutralise the acids and molecular sieves to adsorb moisture); the volume of free-grains drying agents used in a CARLY filter drier is greater than that present in an equivalent model with a solid core.
- Initial drying capacity guaranteed by a 200 °C oven drying and airtight sealing.
- Drying ensured for the subcritical CO₂ applications at low temperatures.
- A dispenser located at the inlet ensures optimal distribution and permanent treatment of the whole refrigerant, inside the filter drier.
- The copper-plated steel connections facilitate the brazing and allow using brazing alloys with a low silver percentage.
- Installation possible in all positions.



Anti-acid filter driers

→ DCY-P6 / 64 bar (928 psig)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component,
- Other are general to all CARLY components,

and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;

they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to DCY-P6 filter driers

- Filter driers are to be mounted on the liquid line between the receiver and the expansion element.
- The refrigerant flow direction is indicated by an “IN” mark in the inlet shell of the filter drier and by an arrow on the filter drier tag. It must be necessarily respected.
- We recommend the vertical mounting of the filter drier with a top-down fluid flow direction in order to favour its filling when in operation and a rapid flow of the fluid when the installation is shut down.
- We recommend the use of a brasing at 10 % silver minimum for the brasing of the copper coated silver unions.
- Be careful to properly select the solenoid valves located downstream of the filter driers; their over-sizing could cause liquid hammer phenomena hindering the filter driers’ mechanical behaviour; protection of regulation elements located upstream of the evaporator should be performed with FILTRY dirt filters (refer to chapter 11 of CARLY technical catalogue); these liquid hammer phenomena can originate from other sources, in longpiping installations.
- Never install the filter driers in an area of the circuit that can be isolated.
- Never trap the refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- The filter driers must be changed :
 - after each intervention on the installation requiring the opening of the circuit
 - when the liquid indicator VCYL-P indicates an abnormal humidity content
 - when the pressure loss measured in the dewatering filter is too high
 - at least once a year as a measure of precaution
- A filter drier saturated in humidity no longer retains the water molecules which circulate then in the circuit ; these molecules in contact with other materials

and with the POE oils which are very hydrophilic are liable to form acids which can be fatal for the installation ; therefore, it is very important to use filter driers containing activated alumina in order to neutralise as rapidly as possible the acids present in the circuit and not filter driers with only 100 % of a molecular screen.

- Filter drier efficiency and refrigerant moisture content should be checked using VCYL-P liquid sight glasses.
- Make sure that the piping can support without deformation the weight of the filter drier ; otherwise, plan the attachment of the filter drier with a clamp on a stable part of the installation.



Anti-acid filter driers

→ DCY-P6 / 64 bar (928 psig)

■ Special precautions for components used with CO₂ in subcritical systems

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The hot gas defrost, frequently used with CO₂ for low temperatures applications, generates also high pressures (to take in consideration)
- The implementation on the liquid line of a filter drier **DCY-P6** is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice and even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly **filter drier DCY-P6** do not have polymer gaskets directly in contact with CO₂.



Anti-acid filter driers

→ DCY-P6 / 64 bar (928 psig)

■ Selection table

CARLY references	Connections		CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾				Dehydratable refrigerant capacity kg of refrigerant ⁽²⁾						
	To screw SAE inch	To solder ODF inch			R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽³⁾	R407C R407F		R134a R410A		R404A R507		R744 CO ₂
									24 °C	52 °C	24 °C	52 °C	24 °C	52 °C	
DCY-P6 053	3/8				22,0	16,0	23,5	25,8	9,5	9,0	11,5	10,0	9,5	8,0	5,8
DCY-P6 053 S		3/8	DCY-P6 053 MMS	10	22,0	16,0	23,5	25,8	9,5	9,0	11,5	10,0	9,5	8,0	5,8
DCY-P6 164	1/2				40,0	32,0	43,0	46,5	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY-P6 164 S		1/2	DCY-P6 164 MMS	12	40,0	32,0	43,0	46,5	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DCY-P6 305	5/8				68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DCY-P6 305 S/MMS		5/8		16	68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for $T_o = -15\text{ °C}$, $T_k = 30\text{ °C}$ and $\Delta p = 0.07\text{ bar}$.
If different conditions, refer to correction factors in chapter 112 of CARLY technical catalogue.

⁽²⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86.

⁽³⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$

For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$,
For $T_o = -30\text{ °C}$ $Q_o = Q_n - 2\%$,

For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$,
For $T_o = -20\text{ °C}$ $Q_o = Q_n - 6\%$

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



Anti-acid filter driers

→ DCY-P6 / 64 bar (928 psig)

■ Example of selection of a DCY-P6 anti-acid filter drier

The sizing of a product implies that the buyer takes into account the conditions under which the product is going to be used (temperature - pressure - refrigerant - oil - external environment). The values proposed in the CARLY catalogue selection tables match specific test conditions.

In order to define a correct sizing, we suggest that you convert your operating data into data that match the CARLY selection tables.

- Installation operating with CO₂ under the following conditions⁽¹⁾ :
 - To = - 40 °C
 - Tk = - 10 °C
 - Q_o = 78 kW
 - 42 kg of refrigerant at 24 °C
- Which DCY-P6 anti-acid filter drier to choose?

DCY-P6 selection

• DCY-P6 type selection and reading of selection table on page 1.12

- CO₂
- 42 kg refrigerant at 24 °C
- Q_o = 78 kW

Filter drier volume selection depends on the installation total refrigerant capacity. For a quantity of 42 kg of CO₂, selection should be done from the DCY-P6 300 product line. See dehydratable refrigerant capacity column.

Selection of the connection, hence of the filter drier, is performed by carrying the Q_o refrigerating capacity and the refrigerant over to the refrigerating capacity column.

Result: DCY-P6 305 S/MMS (connections to solder) **or DCY-P6 305** (connections to screw)

If the Q_o value is between two CARLY filter drier types in the selection table, it is recommended to select the filter drier with the greater capacity.

CARLY references	Connections		CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾				Dehydratable refrigerant capacity kg of refrigerant ⁽²⁾							
	To screw SAE inch	To solder ODF inch			To solder ODF mm	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂	R22 R407C R407F		R134a R410A		R404A R507		R744 CO ₂
										24 °C	52 °C	24 °C	52 °C	24 °C	52 °C	
DCY-P6 164	1/2				42,0	34,0	46,0	50,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5	
DCY-P6 164 S		1/2	DCY-P6 164 MMS	12	42,0	34,0	46,0	50,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5	
DCY-P6 305	5/8				68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5	
DCY-P6 305 S/MMS		5/8	DCY-P6 305 S/MMS	16	68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5	

⁽¹⁾ Chapter "Abbreviations and units" (refer to chapter 113 of CARLY technical catalogue).

⁽²⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86.



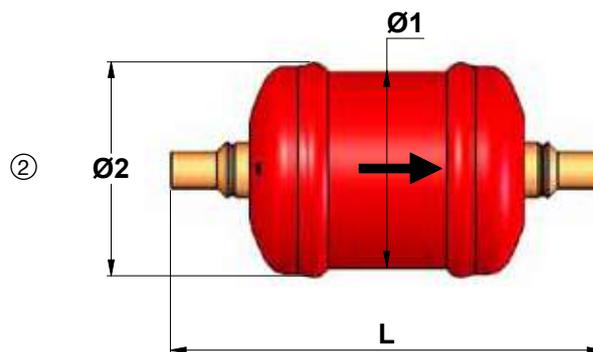
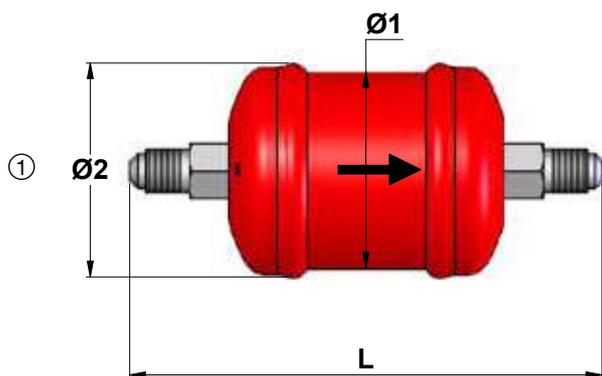
Anti-acid filter driers

→ DCY-P6 / 64 bar (928 psig)

■ Technical features

CARLY references	Connections types ⁽¹⁾	Drawing Nb	Filtering surface cm ²	Volume of desiccation products cm ³	Dimensions		
					Ø1 mm	Ø2 mm	L mm
DCY-P6 053	1	1	52	82	50	55	126
DCY-P6 053 S	DCY-P6 053 MMS	2	52	82	50	55	110
DCY-P6 164	1	1	102	322	70	76	180
DCY-P6 164 S	DCY-P6 164 MMS	2	102	322	70	76	159
DCY-P6 305	1	1	102	582	70	76	260
DCY-P6 305 S/MMS	2	2	102	582	70	76	240

⁽¹⁾ Chapter "Connection features and drawings" (refer to chapter 114 of CARLY technical catalogue).



CARLY references	Volume V L	Maximal working pressure PS bar	Working pressure ⁽¹⁾ PS BT bar	Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature ⁽¹⁾ TS BT °C	CE Category ⁽²⁾	
								DCY-P6 053
DCY-P6 053 S	DCY-P6 053 MMS	0,12	64	15	100	-40	-30	Art3§3
DCY-P6 164	0,42	64	15	100	-40	-30	Art3§3	
DCY-P6 164 S	DCY-P6 164 MMS	0,42	64	15	100	-40	-30	Art3§3
DCY-P6 305	0,68	64	15	100	-40	-30	Art3§3	
DCY-P6 305 S/MMS	0,68	64	15	100	-40	-30	Art3§3	

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to Chapter 0 of CARLY technical catalogue).



Anti-acid filter driers

→ DCY-P6 / 64 bar (928 psig)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DCY-P6 053	0,33	0,30	1
DCY-P6 053 S & MMS	0,33	0,30	1
DCY-P6 164	1,04	1,00	1
DCY-P6 164 S& MMS	1,04	1,00	1
DCY-P6 305	1,57	1,50	1
DCY-P6 305 S/MMS	1,57	1,50	1



Anti-acid filter driers

→ DCY-P14 / 140 bar (2030 psig)

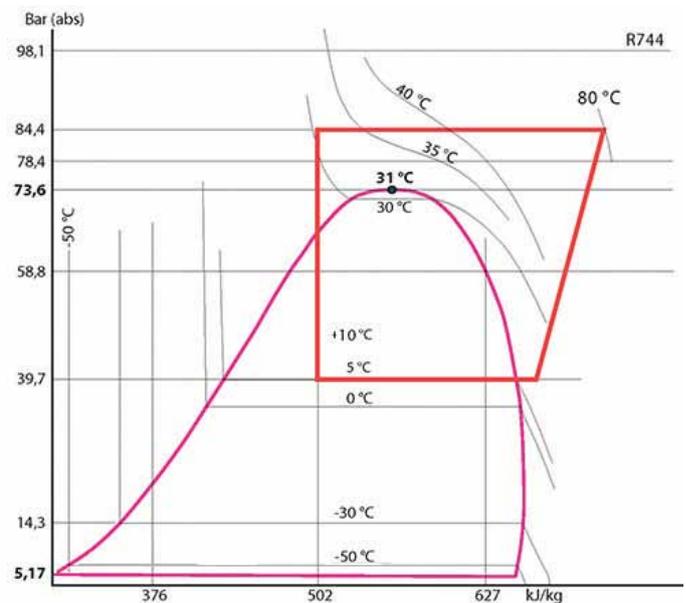
■ Applications

- Filtering and drying of refrigerants and acid neutralization for liquid lines of refrigerating and air conditioning installations, running with high working pressures with CO₂ in transcritical compression systems.



140 bar

CO₂ TRANSCRITICAL



■ Functional features

- Products are compatible with CO₂, as well as with its associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is done with the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- No desorption, even at a high temperature.
- Several types of connections are possible on standard products:
 - To be brazed or welded for tubes in inches (S)
 - To be brazed or welded for tubes in millimeters (MMS)



Possible customization on demand:

- Stainless steel casings and unions (resistance to corrosion and at low temperatures).

■ CARLY advantages

- Maximal working pressure: up to 140 bar with CO₂ in transcritical compression systems.
- Great drying and acid neutralization capacity at all temperatures, thanks to a rigorous selection and a judicious mix of the chemical agents present in the filter driers (activated alumina in order to neutralise the acids and molecular sieves to adsorb moisture); the volume of free-grains drying agents used in a CARLY filter drier is greater than that present in an equivalent model with a solid core.
- Initial drying capacity guaranteed by a 200 °C oven drying and airtight sealing.
- A dispenser located at the inlet ensures optimal distribution and permanent treatment of the whole refrigerant, inside the filter drier.
- Installation possible in all positions.



Anti-acid filter driers

→ DCY-P14 / 140 bar (2030 psig)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component,
- Other are general to all CARLY components,

and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;

they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to DCY-P14 filter driers

- Filter driers are to be mounted on the liquid line between the receiver and the expansion element.
- The refrigerant flow direction is indicated by an "IN" mark in the inlet shell of the filter drier and by an arrow on the filter drier tag. It must be necessarily respected.
- We recommend the vertical mounting of the filter drier with a top-down fluid flow direction in order to favour its filling when in operation and a rapid flow of the fluid when the installation is shut down.
- We recommend the use of a brasing at 38 % silver minimum for the brasing of the copper coated steel connections.
- Be careful to properly select the solenoid valves located downstream of the filter driers; their over-sizing could cause liquid hammer phenomena hindering the filter driers' mechanical behaviour; these liquid hammer phenomena can originate from other sources, in longpiping installations.
- Never install the filter driers in an area of the circuit that can be isolated.
- Never trap the refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- The filter driers must be changed :
 - after each intervention on the installation requiring the opening of the circuit
 - when the liquid indicator VCYL-P indicates an abnormal humidity content
 - when the pressure loss measured in the dewatering filter is too high
 - at least once a year as a measure of precaution
- A filter drier saturated in humidity no longer retains the water molecules which circulate then in the circuit ; these molecules in contact with other materials and with the POE oils which are very hydrophilic are liable to form acids which can be fatal for the installation ; therefore, it is very important to use filter driers containing activated alumina in order to neutralise as rapidly as possible the acids present in the circuit and not filter driers with only 100 % of a molecular screen.
- Filter drier efficiency and refrigerant moisture content should be checked using VCYL-P liquid sight glasses.
- Make sure that the piping can support without deformation the weight of the filter drier ; otherwise, plan the attachment of the filter drier with a clamp on a stable part of the installation.



Anti-acid filter driers

→ DCY-P14 / 140 bar (2030 psig)

■ Special precautions for components used with CO₂ in transcritical systems

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The implementation on the liquid line of a filter drier **DCY-P14** is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice and even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly filter drier DCY-P14 do not have polymer gaskets directly in contact with CO₂.



Anti-acid filter driers

→ DCY-P14 / 140 bar (2030 psig)

■ Selection table

CARLY references	Connections	CARLY references	Connections	Dehydratable refrigerant capacity
	To solder		To solder	kg of refrigerant
	ODF		ODF	R744 CO ₂
	inch		mm	24 °C
DCY-P14 052 S/MMS	1/4	DCY-P14 052 S/MMS	6	5,8
DCY-P14 053 S/MMS	3/8	DCY-P14 053 S/MMS	10	5,8
DCY-P14 163 S/MMS	3/8	DCY-P14 163 S/MMS	10	24,3
DCY-P14 164 S/MMS	1/2	DCY-P14 164 S/MMS	12	24,3
DCY-P14 165 S/MMS	5/8	DCY-P14 165 S/MMS	16	24,3
DCY-P14 304 S/MMS	1/2	DCY-P14 304 S/MMS	12	42,5
DCY-P14 305 S/MMS	5/8	DCY-P14 305 S/MMS	16	42,5
DCY-P14 415 S/MMS	5/8	DCY-P14 415 S/MMS	16	69,2

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



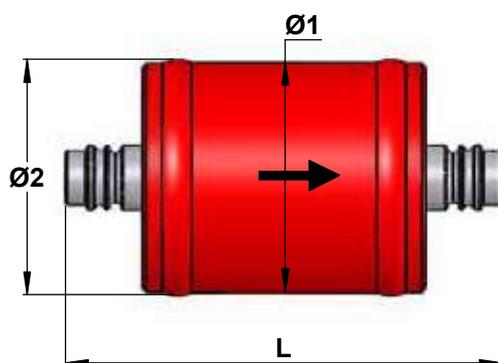
Anti-acid filter driers

→ DCY-P14 / 140 bar (2030 psig)

■ Technical features

CARLY references	Connections types ⁽¹⁾	Filtering surface cm ²	Volume of desiccation products cm ³	Dimensions		
				Ø1 mm	Ø2 mm	L mm
DCY-P14 052 S/MMS	4	65	61	60	64	114
DCY-P14 053 S/MMS	4	65	61	60	64	114
DCY-P14 163 S/MMS	4	100	195	73	77	160
DCY-P14 164 S/MMS	4	100	195	73	77	176
DCY-P14 165 S/MMS	5	100	195	73	77	176
DCY-P14 304 S/MMS	4	100	431	73	77	252
DCY-P14 305 S/MMS	5	100	431	73	77	252
DCY-P14 415 S/MMS	5	150	700	89	92	260

⁽¹⁾ Chapter "Connection features and drawings" (refer to chapter 114 of CARLY technical catalogue).



CARLY references	Volume V L	Maximal working pressure PS bar	Working pressure ⁽¹⁾ PS BT bar	Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature ⁽¹⁾ TS BT °C	CE Category ⁽²⁾
DCY-P14 053 S/MMS	0,10	140	15	100	-40	-30	Art3§3
DCY-P14 163 S/MMS	0,27	140	15	100	-40	-30	Art3§3
DCY-P14 164 S/MMS	0,27	140	15	100	-40	-30	Art3§3
DCY-P14 165 S/MMS	0,27	140	15	100	-40	-30	Art3§3
DCY-P14 304 S/MMS	0,51	140	15	100	-40	-30	I
DCY-P14 305 S/MMS	0,51	140	15	100	-40	-30	I
DCY-P14 415 S/MMS	0,84	140	15	100	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to Chapter 0 of CARLY technical catalogue).



Anti-acid filter driers

→ DCY-P14 / 140 bar (2030 psig)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DCY-P14 052 S/MMS	1,09	0,96	1
DCY-P14 053 S/MMS	1,09	0,96	1
DCY-P14 163 S/MMS	2,23	2,10	1
DCY-P14 164 S/MMS	2,23	2,10	1
DCY-P14 165 S/MMS	2,23	2,10	1
DCY-P14 304 S/MMS	3,03	2,90	1
DCY-P14 305 S/MMS	3,03	2,90	1
DCY-P14 415 S/MMS	4,49	4,36	1



Bi-directional flow and anti-acid filter driers

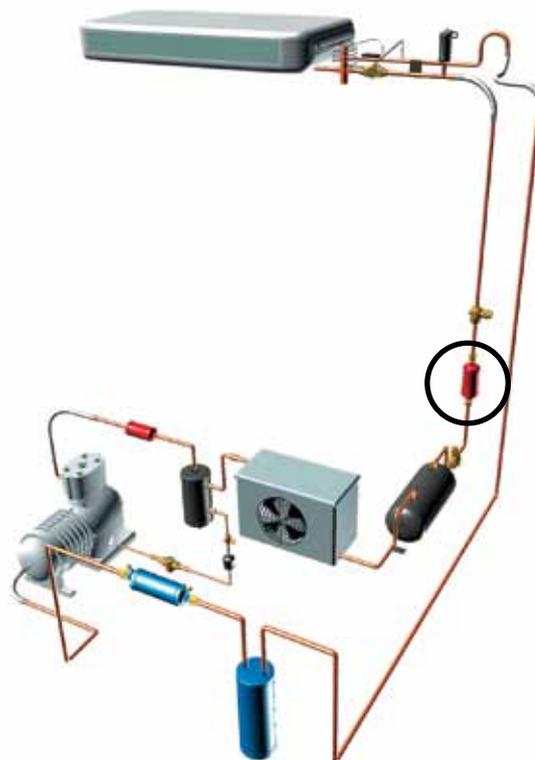
→ DDCY

■ Applications

- Refrigerant filtering, drying and acid neutralization for refrigerating and air conditioning installation liquid lines with change over in flow direction, including heat pumps, with refrigerating capacity up to 450 KW.



NEW MODELS
 DDCY 409 - 411 - 513 - 517 S
 from 1 1/8" to 2 1/8"
 from 115 kW to 450 kW



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Refrigerant flow is possible in both directions, and filtering is ensured whichever the direction.
- External steel body hermetically sealed with paint to ensure a high resistance to corrosion.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- No desorption, even at a high temperature.
- Several types of connections are possible on standard products:
 - To be screwed type SAE
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimeters (MMS)



Possible customization on demand:

- Specific connections (O-RING, ORFS, ...)
- Aluminium casings and unions (weight optimisation)
- Stainless steel casings and unions (resistance to corrosion and at low temperatures)
- Connections to braze, 100 % copper.

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Two-way filter drier with very low pressure loss thanks to a CARLY patented internal check valve system ensuring an optimum circuiting of the flows.
- No risk of discharge of the pollutants trapped inside the filter driers, during change over in flow directions.
- Great drying and acid neutralization capacity at all temperatures, thanks to a rigorous selection and a judicious mix of the chemical agents present in the filter driers (activated alumina in order to neutralise the acids and molecular sieves to adsorb moisture); the volume of free-grains drying agents used in a CARLY filter drier is greater than that present in an equivalent model with a solid core.
- Initial drying capacity guaranteed by a 200 °C oven drying and airtight sealing.
- Drying ensured for the subcritical CO₂ applications at low temperatures.
- Filter driers sizes that ensure interchangeability with most products of the market.
- A dispenser located at the inlet ensures optimal distribution and permanent treatment of the whole refrigerant, inside the filter drier.
- The copper-plated steel connections up to a diameter of 3/4" - 18 mm facilitate the brazing and allow using brazing alloys with a low silver percentage.
- Mounting is possible in all positions.
- GOST certified products.



Bi-directional flow and anti-acid filter driers

→ DDCY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

- The installation of a component in a refrigeration system by a skilled professional, requires some precautions:
- Some are specific to each component, and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;
- Other are general to all CARLY components, they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.
- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the DDCY bi-flow filter driers

- Filter driers are to be mounted on the liquid line, upstream of the pressure relief valve.
- We recommend the vertical mounting of the two-way filter drier in order to favour its filling when in operation.
- We recommend the use of a brasing at 10 % silver minimum for the brasing of the copper coated silver unions.
- Be careful to properly select the solenoid valves located downstream of the filter driers; their over-sizing could cause liquid hammer phenomena hindering the filter driers' mechanical behaviour; protection of regulation elements located upstream of the evaporator should be performed with FILTRY dirt filters (refer to chapter 11 of CARLY technical catalogue); these liquid hammer phenomena can originate from other sources, in longpiping installations.
- Never install the filter driers in an area of the circuit that can be isolated.
- Never trap the refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- The filter driers must be changed :
 - after each intervention on the installation requiring the opening of the circuit
 - when the liquid indicator (VCYL or VCYLS) indicates an abnormal humidity content
 - when the pressure loss measured in the filter drier is too high
 - at least once a year as a measure of precaution
- A filter drier saturated in humidity no longer retains the water molecules which circulate then in the circuit ; these molecules in contact with other materials and with the POE oils which are very hydrophilic are liable to form acids which can be fatal for the installation ; therefore, it is very important to use dewatering filters containing activated alumina in order to neutralise as rapidly as possible the acids present in the circuit and not dewatering filters with only 100 % of a molecular screen.
- Filter drier efficiency and refrigerant moisture content should be checked using VCYL or VCYLS liquid sight glasses (refer to chapters 9 or 10 of CARLY technical catalogue).
- Make sure that the piping can support without deformation the weight of the dewatering filter ; otherwise, provide for the attachment of the dewatering filter with a clamp on a stable part of the installation.
- Example of a selection of a DDCY bi-flow filter drier : see example of a selection of a DCY dewatering filter in chapter 1 of CARLY technical catalogue.



Bi-directional flow and anti-acid filter driers

→ DDCY

■ Selection table

CARLY references	Connections		CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾					Dehydratable refrigerant capacity kg of refrigerant ⁽²⁾						
	To screw SAE inch	To solder ODF inch			R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽³⁾	R22 R407C R407F		R134a R410A		R404A R507		R744 CO ₂
										24 °C	52 °C	24 °C	52 °C	24 °C	52 °C	24 °C
DDCY 082	1/4				9,0	8,5	6,5	9,0	10,1	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DDCY 082 S		1/4	DDCY 082 MMS	6	9,0	8,5	6,5	9,0	10,1	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DDCY 083	3/8				24,0	23,0	17,0	24,5	26,9	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DDCY 083 S		3/8	DDCY 083 MMS	10	24,0	23,0	17,0	24,5	26,9	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DDCY 084	1/2				38,0	37,0	30,0	39,5	42,6	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DDCY 084 S		1/2	DDCY 084 MMS	12	38,0	37,0	30,0	39,5	42,6	15,0	14,5	17,0	15,5	14,5	13,5	9,1
DDCY 163	3/8				24,5	24,0	18,0	25,0	27,4	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DDCY 163 S		3/8	DDCY 163 MMS	10	24,5	24,0	18,0	25,0	27,4	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DDCY 164	1/2				41,5	40,0	32,0	43,0	46,5	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DDCY 164 S		1/2	DDCY 164 MMS	12	41,5	40,0	32,0	43,0	46,5	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DDCY 165	5/8				68,0	66,0	50,0	70,0	76,2	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DDCY 165 S/MMS		5/8	DDCY 165 S/MMS	16	68,0	66,0	50,0	70,0	76,2	40,0	34,0	50,0	37,0	38,0	31,0	24,3
DDCY 305	5/8				70,0	68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DDCY 305 S/MMS		5/8	DDCY 305 S/MMS	16	70,0	68,0	51,0	72,0	78,4	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DDCY 307 S/MMS		7/8	DDCY 307 S/MMS	22	110,0	105,0	80,0	115,0	123,2	70,0	61,0	80,5	69,0	69,5	56,0	42,5
DDCY 409 S		1 1/8			161,5	154,5	117,5	169,0	181,0	116,5	101,5	107,5	115,0	116,0	93,5	71,0
DDCY 411 S/MMS		1 3/8	DDCY 411 S/MMS	35	198,0	189,0	144,0	207,0	222,0	116,5	101,5	107,5	115,0	116,0	93,5	71,0
DDCY 513 S		1 5/8			313,0	299,0	228,0	327,5	351,0	155,5	135,5	214,5	153,5	154,5	124,5	94,5
DDCY 517 S/MMS		2 1/8	DDCY 517 S/MMS	54	432,5	413,0	314,5	452,0	484,5	155,5	135,5	214,5	153,5	154,5	124,5	94,5

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for To = -15 °C, Tk = 30 °C and Δp = 0,21bar. If different conditions, refer to correction factors in chapter 112 of CARLY technical catalogue.

⁽²⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86.

⁽³⁾ Refrigerating capacities Qn for Tk = -10 °C and To = -40 °C
 For Tk = 0 °C Qo = Qn + 12 %, For Tk = -20 °C Qo = Qn - 10 %,
 For To = -30 °C Qo = Qn - 2 %, For To = -20 °C Qo = Qn - 6 %

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



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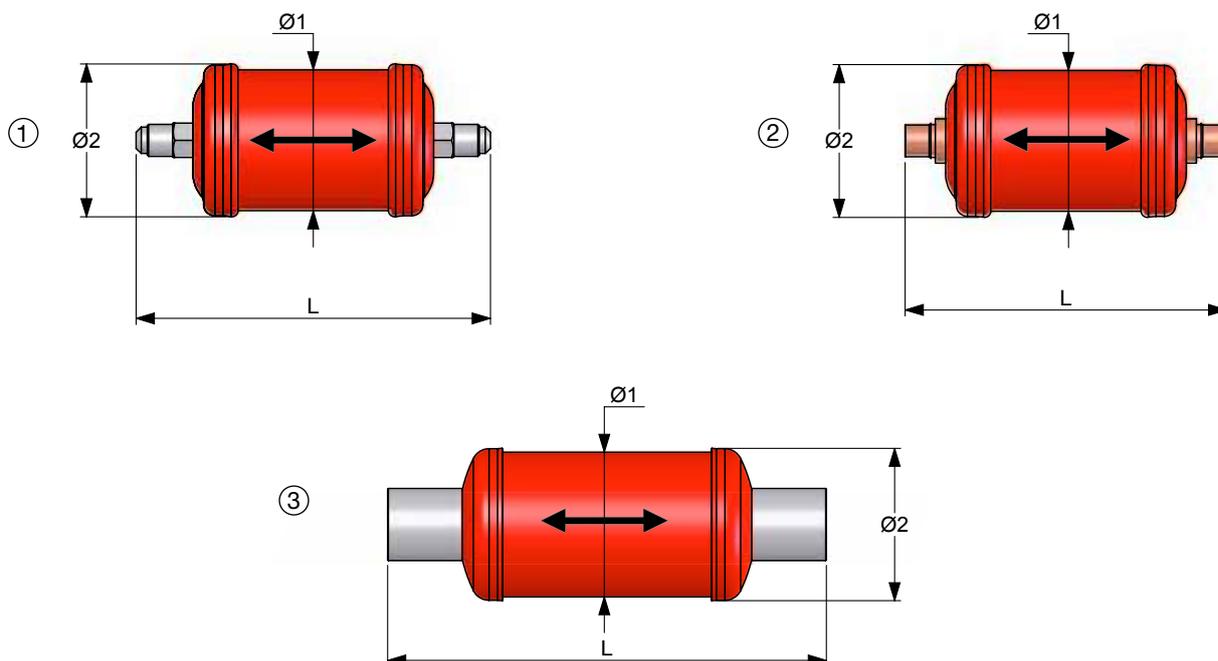
Bi-directional flow and anti-acid filter driers

→ DDCY

■ Technical features

CARLY references	Connection types ⁽¹⁾	Drawing Nb	Filtering surface cm ²	Volume of desiccation products cm ³	Dimensions		
					Ø1 mm	Ø2 mm	L mm
DDCY 082		1	64	118	50,0	55	151
DDCY 082 S	DDCY 082 MMS	2	64	118	50,0	55	141
DDCY 083		1	64	118	50,0	55	157
DDCY 083 S	DDCY 083 MMS	2	64	118	50,0	55	141
DDCY 084		1	64	118	50,0	55	161
DDCY 084 S	DDCY 084 MMS	2	64	118	50,0	55	141
DDCY 163		1	160	298	70,0	76	175
DDCY 163 S	DDCY 163 MMS	2	160	298	70,0	76	159
DDCY 164		1	160	298	70,0	76	179
DDCY 164 S	DDCY 164 MMS	2	160	298	70,0	76	159
DDCY 165		1	160	298	70,0	76	183
DDCY 165 S/MMS	DDCY 165 S/MMS	2	160	298	70,0	76	163
DDCY 305		1	160	558	70,0	76	259
DDCY 305 S/MMS	DDCY 305 S/MMS	2	160	558	70,0	76	239
DDCY 307 S/MMS	DDCY 307 S/MMS	2	160	558	70,0	76	259
DDCY 409 S		3	300	750	101,6	109	251
DDCY 411 S/MMS	DDCY 411 S/MMS	3	300	750	101,6	109	270
DDCY 513 S		3	390	1440	152,4	156	339
DDCY 517 S/MMS	DDCY 517 S/MMS	3	390	1440	152,4	156	366

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114 of CARLY technical catalogue).





Bi-directional flow and anti-acid filter driers

→ DDCY

■ Technical features

CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
DDCY 082	0,17	46	15	100	-40	-30	Art3§3
DDCY 082 S DDCY 082 MMS	0,17	46	15	100	-40	-30	Art3§3
DDCY 083	0,17	46	15	100	-40	-30	Art3§3
DDCY 083 S DDCY 083 MMS	0,17	46	15	100	-40	-30	Art3§3
DDCY 084	0,17	46	15	100	-40	-30	Art3§3
DDCY 084 S DDCY 084 MMS	0,17	46	15	100	-40	-30	Art3§3
DDCY 163	0,41	46	15	100	-40	-30	Art3§3
DDCY 163 S DDCY 163 MMS	0,41	46	15	100	-40	-30	Art3§3
DDCY 164	0,41	46	15	100	-40	-30	Art3§3
DDCY 164 S DDCY 164 MMS	0,41	46	15	100	-40	-30	Art3§3
DDCY 165	0,41	46	15	100	-40	-30	Art3§3
DDCY 165 S/MMS DDCY 165 S/MMS	0,41	46	15	100	-40	-30	Art3§3
DDCY 305	0,66	46	15	100	-40	-30	Art3§3
DDCY 305 S/MMS DDCY 305 S/MMS	0,66	46	15	100	-40	-30	Art3§3
DDCY 307 S/MMS DDCY 307 S/MMS	0,66	46	15	100	-40	-30	Art3§3
DDCY 409 S	1,20	46	15	100	-40	-30	I
DDCY 411 S/MMS DDCY 411 S/MMS	1,20	46	15	100	-40	-30	I
DDCY 513 S	4,20	46	15	100	-40	-30	I
DDCY 517 S/MMS DDCY 517 S/MMS	4,20	46	15	100	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to Chapter 0 of CARLY technical catalogue).

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
DDCY 082	0,43	0,40	24	DDCY 163 S & MMS	0,94	0,90	16
DDCY 082 S & MMS	0,43	0,40	24	DDCY 164	0,99	0,95	16
DDCY 083	0,43	0,40	24	DDCY 164 S & MMS	0,99	0,95	16
DDCY 083 S & MMS	0,43	0,40	24	DDCY 165	1,04	1,00	16
DDCY 084	0,53	0,50	24	DDCY 165 S/MMS	1,04	1,00	16
DDCY 084 S & MMS	0,53	0,50	24	DDCY 305	1,52	1,45	12
DDCY 163	0,94	0,90	16	DDCY 305 S/MMS	1,52	1,45	12
				DDCY 307 S/MMS	1,52	1,45	12
				DDCY 409 S	2,51	2,42	1
				DDCY 411 S/MMS	2,51	2,42	1
				DDCY 513 S	6,08	5,99	1
				DDCY 517 S/MMS	6,08	5,99	1



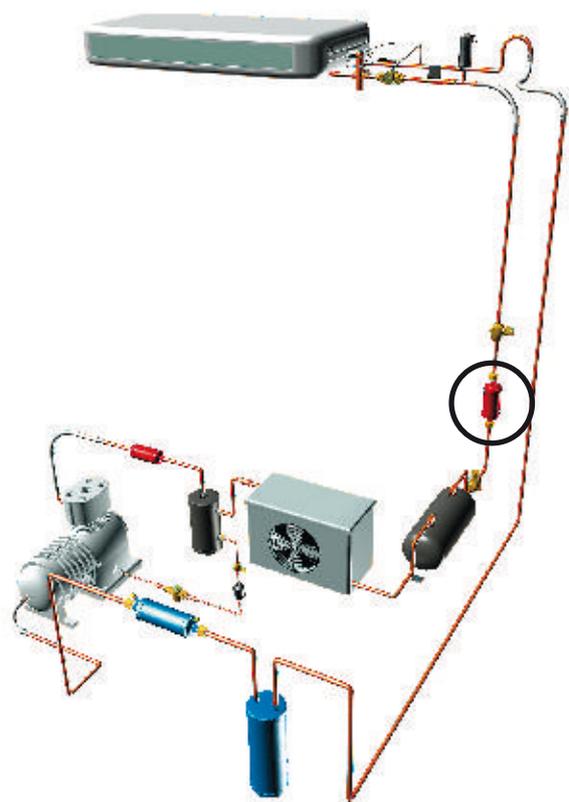
Cleaning bi-directional flow and anti-acid filter driers (liquid line)

CTCY-EN – 3.1-3 / 10-2013

→ DDNCY (Temporary use)

■ Applications

- Cleaning and decontamination of refrigerant circuits in refrigerating and air conditioning installations with change over in flow direction, including heat pumps.
- Temporary uses:
 - new installations during start-up period for a very efficient protection of compressors against all types of dirt.
 - existing installations for an efficient cleaning of the refrigerant after compressor burnout.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Refrigerant flow is possible in both directions, and filtering is ensured whichever the direction.
- External steel body hermetically sealed with paint to ensure a high resistance to corrosion.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- Two Shraeder valves for checking pressure drop, which facilitates the monitoring of filter saturation (except for model DDNCY 083).
- Screw connections type SAE made of nickel-plated steel.
- No desorption, even at high temperatures.
- Easy installation, in the liquid line between the condensing unit and terminal units (evaporators or air conditioning indoor units).

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Bi-flow filter drier with very low pressure loss thanks to a CARLY patented internal check valve system ensuring an optimum circuiting of the flows.
- High effectiveness in the neutralisation of acids and fixing of waxes and sludge at all temperatures thanks to a rigorous selection and a wise mixture of chemical agents present in the cleaning filter driers : molecular sieves, activated alumina, activated carbon.
- Drying and depollution of the coolant fluid ensured for the subcritical CO₂ applications at low temperatures.
- Chemical agents in the form of free grain, for increased performance and elimination of the risk of polluting the circuit with solid particles, consecutive to drying core break-up.
- No risk of discharge of the pollutants trapped inside the filter driers, during change over in flow directions.
- Very economical cleaning process with no loss of time, because the installation is still running during the operation.
- Environmental protection and savings of refrigerant, because using these cleaning filters allows re-use of the refrigerant after pollution control.
- Installation possible in all positions.
- GOST certified products.



Cleaning bi-directional flow and anti-acid filter driers (liquid line)

→ DDNCY (Temporary use)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the DDNCY cleaning bi-flow filter driers

- Cleaning filter driers are to be mounted on the liquid line, upstream from the expansion valve.
- We recommend the vertical mounting of the bi-flow filter drier in order to favour its filling when in operation.
- Be careful to properly select the solenoid valves located downstream of the filter driers; their oversizing could cause liquid hammer phenomena hindering the filter driers mechanical behaviour; protection of the regulation elements upstream of the evaporator should be performed with FILTRY dirt filters (refer to chapter 11); these liquid hammer phenomena can come from other sources, in long-piping installations.
- Never install filter driers in an area of the circuit that can be isolated.
- Never trap refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- These filters are products intended for temporary use only; they should not be left permanently on the circuit.
- Closely monitor the pressure drop thanks to the Schraeder valves, (except model DDNCY 083).
- After compressor burnout:
 - refer to the instructions given by the manufacturer, for circuit cleaning operations and compressor replacement
 - apply the CARLY decontamination procedure described hereafter
- Keep an eye on the refrigerants condition and its level of humidity, with the liquid sight glasses VCYL or VCYLS (see chapters 9 and 10).
- Make sure that the piping can support without deformation the weight of the filter drier ; otherwise, provide for the attachment of the cleaning filter drier with a clamp on a stable part of the installation.
- Example of a selection of a DDNCY cleaning bi-flow filter drier: see example of a selection of a DCY dewatering filter in chapter 1.



Cleaning bi-directional flow and anti-acid filter driers (liquid line)

→ DDNCY (Temporary use)

■ Decontamination procedure for a refrigerating circuit, after a compressor burnout, using cleaning bi-flow filter driers DDNCY

- 1 • Evaluate the importance of the circuit contamination. If the pollution present in the refrigerating circuit is not too high, it is economical to recover the refrigerant for re-use after treatment.
- 2 • Install replacement compressor and perform usual checks.
- 3 • Install special **FNCY** «burnout» filter drier, on the suction line between the 4 ways valves and the compressor, if it is possible (refer to the decontamination procedure of chapter 15)
- 4 • Install the cleaning bi-flow filter drier **DDNCY**, selected according to the installation capacity, on the liquid line, upstream from the expansion valve.
- 5 • Check circuit leak-tightness according to the art.
- 6 • Create vacuum in the installation.
- 7 • Fill the circuit.
- 8 • Power up the installation and monitor the **DDNCY** and **FNCY** pressure drop evolution using their checking valves (except model 083)
- 9 • Replace filter if pressure drop becomes too important (> 0.5 bar for **DDNCY** and **FNCY**); increase of pressure drop indicates that the **FNCY** is performing its decontamination role.
- 10 • Monitor system operation during the first four hours (this monitoring must be increased when the compressor is hermetic or hermetic accessible). Replace **DDNCY** and **FNCY** as often as necessary until pressure drop in **DDNCY** and **FNCY** remains acceptable.
- 11 • After 48 hours of operation in decontamination phase, proceed to an oil sampling; visually inspect the sampling condition and check the oil acidity level using **TESTOIL** oil acidity tests: **TESTOIL-POE** for polyol-ester oils or **TESTOIL-MAS** for synthetic alkylbenzene and mineral oils (refer to chapter 91). If this sampling shows a non-satisfactory quality, drain oil, replace oil filter **HCYF** or **HYDROIL**, **DDNCY** and **FNCY**.
Repeat the operation starting from phase 8.
If this sampling shows a satisfactory quality, replace the **DDNCY** by a bi-flow filter drier **DDCY** and replace **FNCY** by **FACY** suction cleaning filter bearing the same reference and perfectly interchangeable (refer to chapters 2 and 13)
- 12 • After about 15 days, proceed to a new oil analysis by repeating stage 11.

 This process ensures complete circuit decontamination and pollution control, thus protecting the new compressor and all the other components of a refrigerating circuit after compressor burnout.



Cleaning bi-directional flow and anti-acid filter driers (liquid line)

→ DDNCY (Temporary use)

■ Technical features

CARLY references	Flare connections SAE inch	Refrigerating capacity kW ⁽¹⁾					Dehydratable refrigerant capacity kg of refrigerant ⁽²⁾						
		R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽³⁾	R22 R407C R407F		R134a R410A		R404A R507		R744 CO ₂
							24 °C	52 °C	24 °C	52 °C	24 °C	52 °C	24 °C
DDNCY 083	3/8	24,0	23	17	24,5	26,9	8	7,5	9	8	8	7	4,9
DDNCY 164	1/2	41,5	40	32	43,0	46,5	22	18,0	28	20	21	16	13,4
DDNCY 305	5/8	70,0	68	51	72,0	78,4	40	34,0	44	38	39	31	24,3

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for $T_o = -15\text{ °C}$, $T_k = 30\text{ °C}$ and $\Delta p = 0.07\text{ bar}$.
If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86.

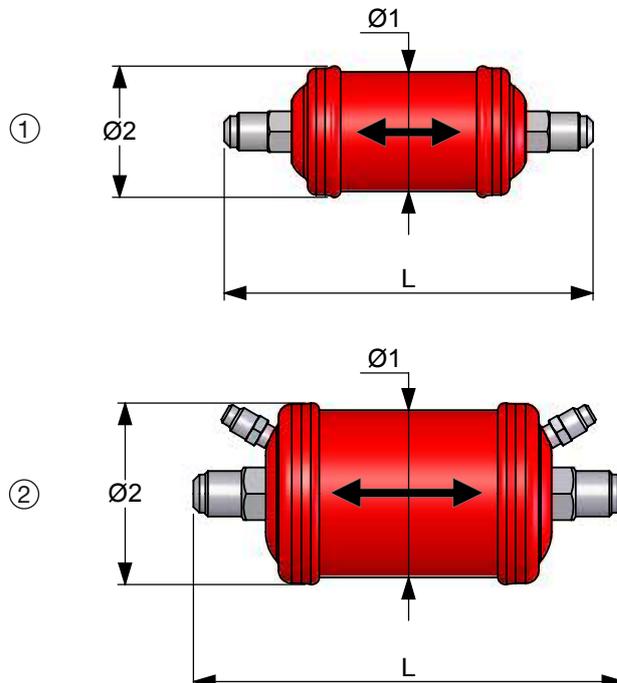
⁽³⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$
 For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$, For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$,
 For $T_o = -30\text{ °C}$ $Q_o = Q_n - 2\%$, For $T_o = -20\text{ °C}$ $Q_o = Q_n - 6\%$

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.

■ Technical features

CARLY references	Connection types ⁽¹⁾	Drawing Nb	Filtering surface cm ²	Volume of desiccation products cm ³	Dimensions		
					Ø1 mm	Ø2 mm	L mm
DDNCY 083	1	1	64	118	50	55	157
DDNCY 164	1	2	160	298	70	76	179
DDNCY 305	1	2	160	558	70	76	259

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).





Cleaning bi-directional flow and anti-acid filter driers (liquid line)

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→ DDNCY (Temporary use)

■ Technical features

CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
DDNCY 083	0,17	46	15	100	-40	-30	Art3§3
DDNCY 164	0,41	46	15	100	-40	-30	Art3§3
DDNCY 305	0,66	46	15	100	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to Chapter 0).

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DDNCY 083	0,43	0,40	24
DDNCY 164	0,99	0,95	16
DDNCY 305	1,57	1,50	12



Filter drier receiver units

→ RCY

■ Applications

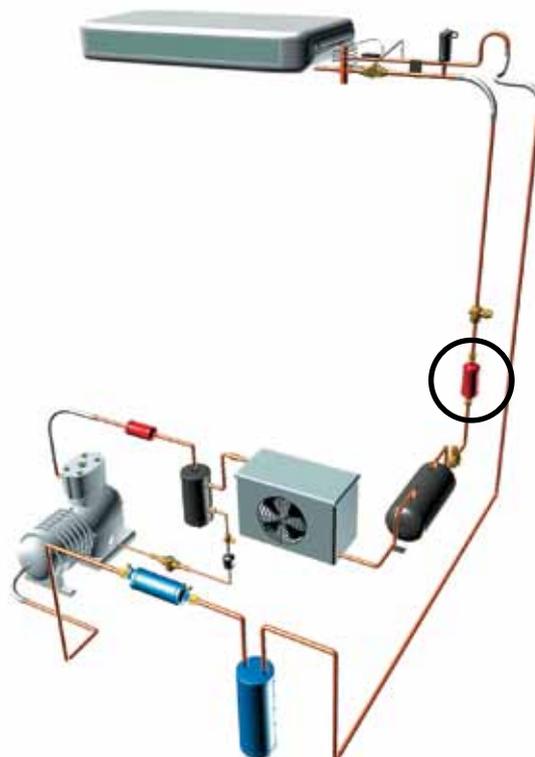
- Refrigerant filtering and drying, and acid neutralization for refrigerating and air conditioning installation liquid lines.
- The filter driers receivers provide a permanent reserve of dehydrated and filtered refrigerant, for a better supply of the expansion valve, whatever the operating conditions.
- The filter drier receivers are particularly suited to low capacity installations that operate with a thermostatic pressure relief valve and that are equipped with an air-cooled condenser or a plate condenser.
- Filter drier receivers fit perfectly within the heat pump systems.



Standard product



Customized product



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- No desorption, even at high temperatures.



Possible customization on request:

- Drying capacity
- Receiver volume
- Specific unions (O-RING, ORFS, etc.)
- Adding of an indicator with or without hygroscopic paper on the receiver part
- Aluminium casings and connections (weight optimisation)
- Stainless steel casings and connections (resistance to corrosion and at low temperatures)
- Connections to braze, 100 % copper
- Model « Bi-flow ».

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Compared to an assembly with two separated components (filter drier + receiver)
 - Space gain on the installation
 - Optimisation of assembly time
 - 2 connections to be screwed or brased instead of 4 ; therefore, reducing the risk of leakage
- Great drying and acid neutralization capacity at all temperatures, thanks to a rigorous selection and a judicious mix of the chemical agents present in the filter driers (activated alumina in order to neutralise the acids and molecular sieves to adsorb moisture); the volume of free-grains drying agents used in a CARLY filter drier is greater than that present in an equivalent model with a solid core.
- Initial drying capacity guaranteed by a 200 °C oven drying and airtight sealing.
- Drying ensured for the subcritical CO₂ applications at low temperatures.
- A dispenser located at the intake ensures optimal distribution and permanent treatment of the whole refrigerant, inside the filter drier receiver.
- The copper-plated steel connections facilitate the brazing and allow using brazing alloys with a low silver percentage.
- GOST certified products.



Filter drier receiver units

→ RCY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the RCY filter-drier receivers

- Filter drier receivers are to be mounted on the liquid line between the condenser and the expansion element.
- The refrigerant flow direction is indicated by an "IN" mark in the inlet shell of the filter drier and by an arrow on the filter drier tag. It must be necessarily respected.
- Mounting of filter drier receivers should always be performed vertically, refrigerant inlet up, for proper use of the receiver part.
- We recommend the use of a brasing at 10 % silver minimum for the brasing of the copper coated silver unions.
- Be careful to properly select the solenoid valves located downstream of the filter driers; their over-sizing could cause liquid hammer phenomena hindering the filter driers' mechanical behaviour; protection of regulation elements located upstream of the evaporator should be performed with FILTRY dirt filters (refer to chapter 11); these liquid hammer phenomena can originate from other sources, in longpiping installations.
- Never install the filter driers in an area of the circuit that can be isolated.
- Never trap the refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- The filter driers must be changed :
 - after each intervention on the installation requiring the opening of the circuit
 - when the liquid indicator (VCYL or VCYLS) indicates an abnormal humidity content
 - when the pressure loss measured in the filter drier is too high
 - at least once a year as a measure of precaution
- A filter drier saturated in humidity no longer retains the water molecules which circulate then in the circuit ; these molecules in contact with other materials and with the POE oils which are very hydrophilic are liable to form acids which can be fatal for the installation ; therefore, it is very important to use filter driers containing activated alumina in order to neutralise as rapidly as possible the acids present in the circuit and not dewatering filters with only 100 % of a molecular screen.
- Filter drier efficiency and refrigerant moisture content should be checked using VCYL or VCYLS liquid sight glasses (refer to chapters 9 or 10).
- Make sure that the piping can support without deformation the weight of the filter drier ; otherwise, provide for the attachment of the filter drier with a clamp on a stable part of the installation.
- Example of a selection of a RCY for the drying part of the product : see example of a selection of a DCY filter drier in chapter 1. For the liquid tank part of the product, use the usual methods for determining the coolant fluid storage volume by taking into account all the parameters related to the user's application.



Filter drier receiver units

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→ RCY

■ Selection table

CARLY references	Connections		CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾					Dehydratable refrigerant capacity kg of refrigerant ⁽²⁾						
	To screw SAE inch	To solder ODF inch			R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽⁴⁾	R22 R407C R407F		R134a R410A		R404A R507		R744 CO ₂ 24 °C
										24 °C	52 °C	24 °C	52 °C	24 °C	52 °C	
RCY 502-3 S		3/8-1/4 ⁽³⁾			8,0	7,3	5,2	7,9	9,0	10,5	9,0	11,0	10,5	17,0	9,5	6,4
RCY 522 S		1/4	RCY 522 MMS	6	8,0	7,3	5,2	7,9	9,0	10,5	9,0	11,0	10,5	17,0	9,5	6,4
RCY 523 S		3/8	RCY 523 MMS	10	20,0	18,2	13,0	19,8	22,4	10,5	9,0	11,0	10,5	17,0	9,5	6,4
RCY 743 S		3/8	RCY 743 MMS	10	35,0	31,9	22,8	34,7	39,2	38,5	32,5	40,0	38,5	61,0	34,0	23,4
RCY 744 S		1/2	RCY 744 MMS	12	38,0	34,6	24,7	37,6	42,6	38,5	32,5	40,0	38,5	61,0	34,0	23,4
RCY 924 S		1/2	RCY 924 MMS	12	40,0	36,4	26,0	39,6	44,8	50,0	42,5	52,0	50,0	79,0	44,0	30,3
RCY 925 S/MMS		5/8		16	42,0	38,2	27,3	41,6	47,0	50,0	42,5	52,0	50,0	79,0	44,0	30,3

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for $T_o = -15\text{ °C}$, $T_k = 30\text{ °C}$ and $\Delta p = 0.07\text{ bar}$. If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86.

⁽³⁾ Inlet 3/8 - Outlet 1/4

⁽⁴⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$
 For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$, For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$,
 For $T_o = -30\text{ °C}$ $Q_o = Q_n - 2\%$, For $T_o = -20\text{ °C}$ $Q_o = Q_n - 6\%$

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



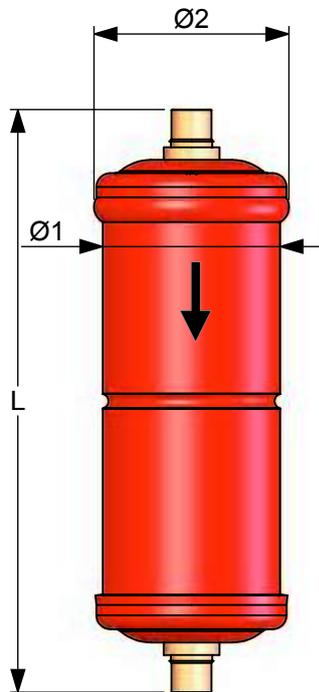
Filter drier receiver units

→ RCY

■ Technical features

CARLY references	Connection types ⁽¹⁾	Filtering surface cm ²	Volume of desiccation products cm ³	Receiver volume L	Dimensions		
					Ø1 mm	Ø2 mm	L mm
RCY 502-3 S	2	52	70	0,12	50	55	161
RCY 522 S	RCY 522 MMS	52	60	0,21	50	55	211
RCY 523 S	RCY 523 MMS	52	60	0,21	50	55	211
RCY 743 S	RCY 743 MMS	102	260	0,33	70	76	232
RCY 744 S	RCY 744 MMS	102	260	0,33	70	76	232
RCY 924 S	RCY 924 MMS	170	290	0,76	89	96	250
RCY 925 S/MMS	2	170	290	1,80	89	96	439

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).





Filter drier receiver units

→ RCY

■ Technical features

CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾	
	V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C		
RCY 502-3 S	0,20	46	15	100	-40	-30	Art 3§3	
RCY 522 S	RCY 522 MMS	0,29	46	15	100	-40	-30	Art 3§3
RCY 523 S	RCY 523 MMS	0,29	46	15	100	-40	-30	Art 3§3
RCY 743 S	RCY 743 MMS	0,63	46	15	100	-40	-30	Art 3§3
RCY 744 S	RCY 744 MMS	0,63	46	15	100	-40	-30	Art 3§3
RCY 924 S	RCY 924 MMS	1,16	46	15	100	-40	-30	I
RCY 925 S/MMS		2,22	46	15	100	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to Chapter 0).

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
RCY 502-3 S	0,38	0,35	1
RCY 522 S & MMS	0,48	0,45	1
RCY 523 S & MMS	0,48	0,45	1
RCY 743 S & MMS	1,03	1,00	1
RCY 744 S & MMS	1,03	1,00	1
RCY 924 S & MMS	1,73	1,65	1
RCY 925 S/MMS	2,43	2,35	1

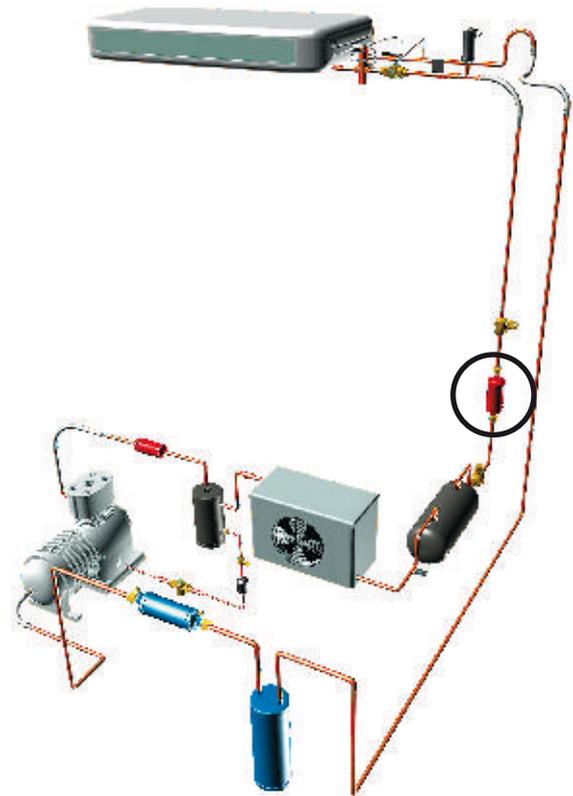


Anti-acid filter driers with liquid sight glass

→ TSGY

■ Applications

- Filtration, drying, and acid neutralization of the refrigerant thanks to the filter drier, and monitoring of the refrigerant state (liquid, humidity) thanks to the liquid sight glass.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is done with the PED 97/23/EC table, corresponding to a volume-based selection.
- External steel body hermetically sealed and painted for the filter drier and body made of stamped brass for the liquid indicator, ensure for both of these assembled components a high resistance to corrosion.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- No desorption, even at a high temperature.
- Visualisation of refrigerant through glass.
- A moisture indicator sensitive to moisture and resistant to acids is positioned under the glass.
- Moisture presence is characterised by a modification of the indicator colour; this modification is reversible.

Possible customization on request:

- Combination specific filter driers / sight glasses (out of catalogue)

■ CARLY advantages

- Maximal working pressure: 42 bar.
- Great drying and acid neutralization capacity at all temperatures, thanks to a rigorous selection and a judicious mix of the chemical agents present in the filter driers (activated alumina in order to neutralise the acids and molecular sieves to adsorb moisture); the volume of free-grains drying agents used in a CARLY filter drier is greater than that present in an equivalent model with a solid core.
- Initial drying capacity guaranteed by a 200 °C oven drying and airtight sealing.
- Drying ensured for the subcritical CO₂ applications at low temperatures.
- A dispenser located at the intake ensures optimal distribution and permanent treatment of the whole refrigerant, inside the filter drier.
- The large size of the glass and the absence of a central hygroscopic tip ensure excellent visibility.
- The sealed design and the seaming principle of the chosen glass ensure perfect air-tightness.
- Two products assembled and controlled in factory, guarantee a perfect air-tightness between the two components.
- GOST certified products.



Anti-acid filter driers with liquid sight glass

→ TSGY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the TSGY filter driers with liquid sight glass

- The filter driers with liquid indicator are to be installed on the liquid pipe between the receiver and the expansion valve.
- The refrigerant flow direction is indicated by an "in" mark in the inlet shell of the filter drier and by an arrow on the filter drier tag. It must be necessarily respected.
- We recommend the vertical mounting of the filter drier with a top-down fluid flow direction in order to favour its filling when in operation and a rapid flow of the fluid when the installation is shut down.
- Be careful to properly select the solenoid valves located downstream of the filter driers; their over-sizing could cause liquid hammer phenomena hindering the filter driers' mechanical behaviour; protection of regulation elements located upstream of the evaporator should be performed with FILTRY dirt filters (refer to chapter 11); these liquid hammer phenomena can originate from other sources, in long piping installations.
- Never install the filter driers in an area of the circuit that can be isolated.
- Never trap a refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- The filter driers must be changed :
 - after each intervention on the installation requiring the opening of the circuit
 - when the liquid indicator VCYL indicates an abnormal humidity content
 - when the pressure loss measured in the filter drier is too high
 - at least once a year as a measure of precaution
- A filter drier saturated in humidity no longer retains the water molecules which circulate then in the circuit ; these molecules in contact with other materials and with the POE oils which are very hydrophilic are liable to form acids which can be fatal for the installation ; therefore, it is very important to use filter driers containing activated alumina in order to neutralise as rapidly as possible the acids present in the circuit and not filter driers with molecule sieve only.
- Filter drier efficiency and refrigerant moisture content should be checked by the sight glass.
- The presence of humidity is rapidly indicated ; on the other hand, the hygroscopic ring indicates a return to the normal situation only a few hours after the filter drier is implemented.
- Make sure that the piping can support without deformation the weight of the filter drier with liquid indicator ; otherwise, provide for the attachment of the dewatering filter with a clamp on a stable part of the installation.



Anti-acid filter driers with liquid sight glass

→ TSGY

■ Selection table

CARLY references	Flare connections SAE inch	Refrigerating capacity kW ⁽¹⁾					Dehydratable refrigerant capacity kg of refrigerant ⁽²⁾						
		R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽³⁾	R22 R407C R407F		R134a R410A		R404A R507		R744 CO ₂
							24 °C	52 °C	24 °C	52 °C	24 °C	52 °C	
TSGY 052	1/4	8,5	8,0	6,0	8,5	9,5	9,5	9,0	11,5	10,0	9,5	8,0	5,8
TSGY 082	1/4	9,0	8,5	6,5	9,0	10,1	15,0	14,5	16,5	15,0	14,5	13,5	9,1
TSGY 083	3/8	24,0	23,0	17,0	24,5	26,9	15,0	14,5	16,5	15,0	14,5	13,5	9,1
TSGY 163	3/8	24,5	24,0	18,0	25,0	27,4	40,0	34,0	50,0	37,0	38,0	31,0	24,3
TSGY 164	1/2	41,5	40,0	32,0	43,0	46,5	40,0	34,0	50,0	37,0	38,0	31,0	24,3

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for $T_o = -15\text{ °C}$, $T_k = 30\text{ °C}$ and $\Delta p = 0.07\text{ bar}$.
If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86.

⁽³⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$
 For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$, For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$,
 For $T_o = -30\text{ °C}$ $Q_o = Q_n - 2\%$, For $T_o = -20\text{ °C}$ $Q_o = Q_n - 6\%$

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.

Example of the selection of a TSGY dewatering filter with liquid indicator for the dewatering part of the product : see example of selection of a DCY filter drier in chapter 1.

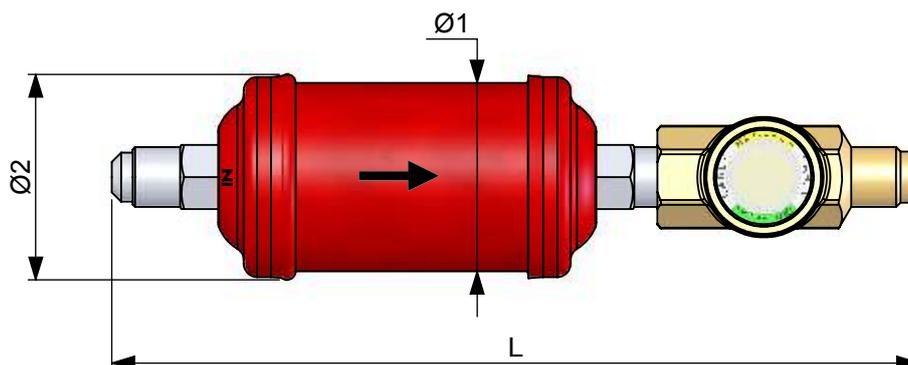


Anti-acid filter driers with liquid sight glass

→ TSGY

■ Technical features

CARLY references	Filtering surface cm ²	Volume of desiccation products cm ³	Dimensions		
			Ø1 mm	Ø2 mm	L mm
TSGY 052	52	82	50	55	171
TSGY 082	52	130	50	55	199
TSGY 083	52	130	50	55	213
TSGY 163	102	322	70	76	233
TSGY 164	102	322	70	76	239



CARLY references	Volume V L	Maximal working pressure PS bar	Working pressure (1) PS BT bar	Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature (1) TS BT °C	CE Category (2)
TSGY 082	0,16	42	/	80	-20	/	Art3§3
TSGY 083	0,17	42	/	80	-20	/	Art3§3
TSGY 163	0,40	42	/	80	-20	/	Art3§3
TSGY 164	0,42	42	/	80	-20	/	Art3§3

(1) The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

(2) Classification by volume, according to PED 97/23/EC (refer to Chapter 0).



Anti-acid filter driers with liquid sight glass

→ TSGY

■ Spare parts

CARLY references	Part N°	Description	Types	Quantity
CY 15590015	1	Set of 25 guided taper copper gaskets for 1/4" SAE (flare) connections	TSGY 052 TSGY 082	1
CY 15590025	1	Set of 25 guided taper copper gaskets for 3/8" SAE (flare) connections	TSGY 083 TSGY 163	1
CY 15590035	1	Set of 25 guided taper copper gaskets for 1/2" SAE (flare) connections	TSGY 164	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TSGY 052	0,48	0,45	24
TSGY 082	0,59	0,55	16
TSGY 083	0,64	0,60	12
TSGY 163	1,14	1,10	12
TSGY 164	1,24	1,20	12



Replaceable core filter drier shells (liquid line)

→ BDCY / BCY / BCY-HP / BBCY

■ Applications

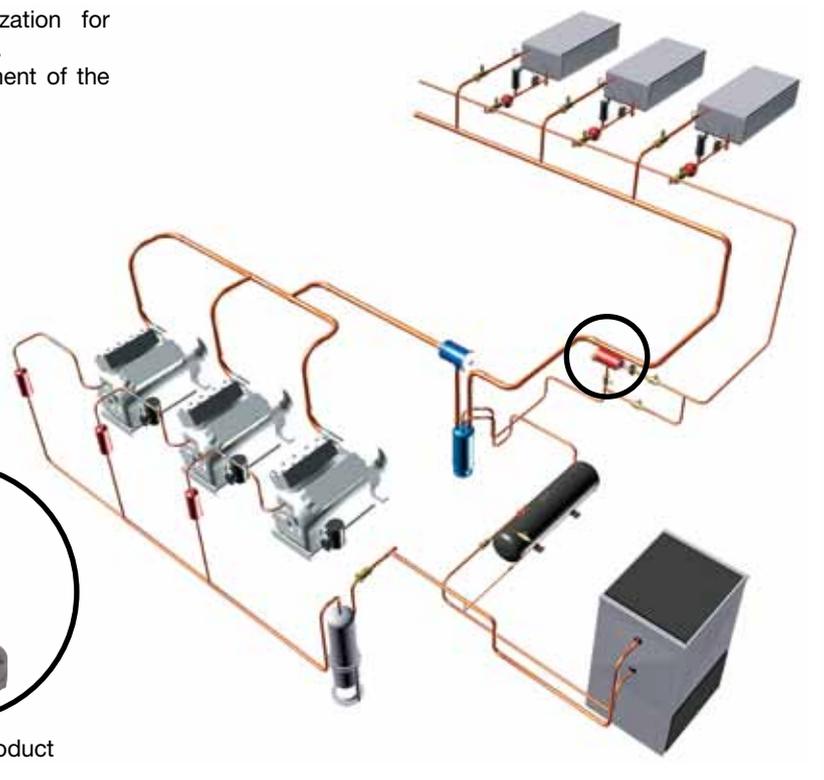
- Refrigerant filtering and drying and acid neutralization for refrigerating and air conditioning installation liquid lines.
- Replaceable core filter drier shells allow the replacement of the filter drier's active parts only.



Standard product



Customized product



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Filtering at outlet preventing the propagation within the circuit of particles bigger than 150 microns, with a very low pressure drop.
- 1/4" NPT taper tapping and its plug on end plate, allowing the installation of a pressure tap or a feeding valve.
- End plate perfectly tight thanks to its circular rim and its gasket compatible with all CFCs, HCFCs, HFCs and CO₂s.



Possible customization on demand:

- Stainless steel casings and connections (corrosion resistance and for use at very low temperature).
- PS 46 bar for BCY-HP 3 and 4 cores.

■ CARLY advantages

- Maximum working pressure : up to 46 bars for the BCY-HP 1 and 2 cartridges for use with R 410 A and CO₂.
- Individual core holders treated against corrosion by zinc coating, with a reduced course for easy core replacement; therefore, replacement time is extremely reduced, limiting the time the drying cores and the inner part of the circuit are exposed to the atmosphere.
- Hermetically sealed external body made of steel to which an impregnation varnish and paint are applied to ensure a high resistance to corrosion ; this varnish ensures the internal anti-corrosion protection of the shell when it is opened for the initial set-up or during the replacement of the drying cores.
- Core holder design ensures automatic and immediate centring of the filter drier shells.
- No flow area restriction outside the filter drier shells thanks to an appropriate filtering system.
- GOST certified products.



Replaceable core filter drier shells (liquid line)

→ BDCY / BCY / BCY-HP / BBCY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

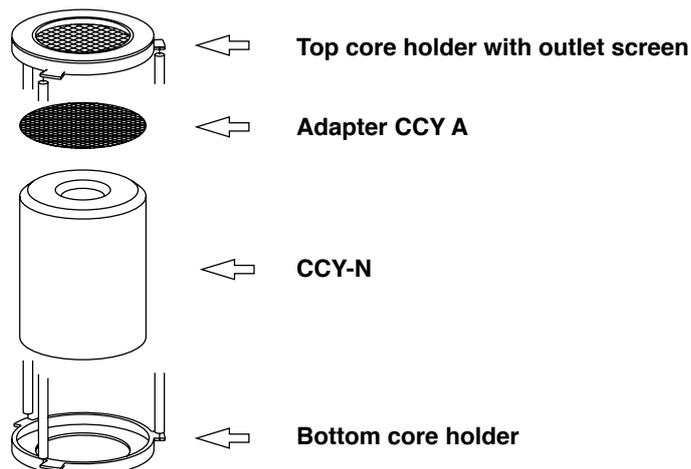
- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Specific recommendations to replaceable core filter drier shells BDCY / BCY / BCY-HP / BBCY

- Filter drier shells are to be mounted on the liquid line between the receiver and the expansion element.
- The refrigerant flow direction, indicated by an arrow on the filter drier shells' tags, should be complied with.
- Assembly can be performed in any position, but not vertically with the outlet connection oriented downwards.
- During filter drier shells assembly, provide for sufficient course to allow core replacement (refer to sizes L2 in the technical features table).
- The connection to the installation, by soldering or welding, of the filter shell, must be done only after removing the closing flange, its gasket and the internal core holders.

- We recommend to clean and to protect the connections of the filter drier shell with appropriate products in order to ensure a good resistance to corrosion of the affected areas.
- Be careful to properly select the solenoid valves located downstream of the filter drier shells; their oversizing could cause liquid hammer phenomena hindering the filter drier shells' proper mechanical behaviour; protection of the regulation elements upstream of the evaporator should be performed with FILTRY dirt filters (refer to chapter 11); these liquid hammer phenomena can originate from other sources, in long-piping installations.
- Never install filter drier shells in an area of the circuit that can be isolated.

- Never trap refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- The filter drier shells' efficiency and the refrigerant's moisture content should be checked using VCYL or VCYLS liquid sight glasses (refer to chapter 9 or 10).
- Make sure that the piping can support without deformation the weight of the filter drier shell ; otherwise, provide for a clamp of the filter drier shell with a clamp on a stable part of the installation.



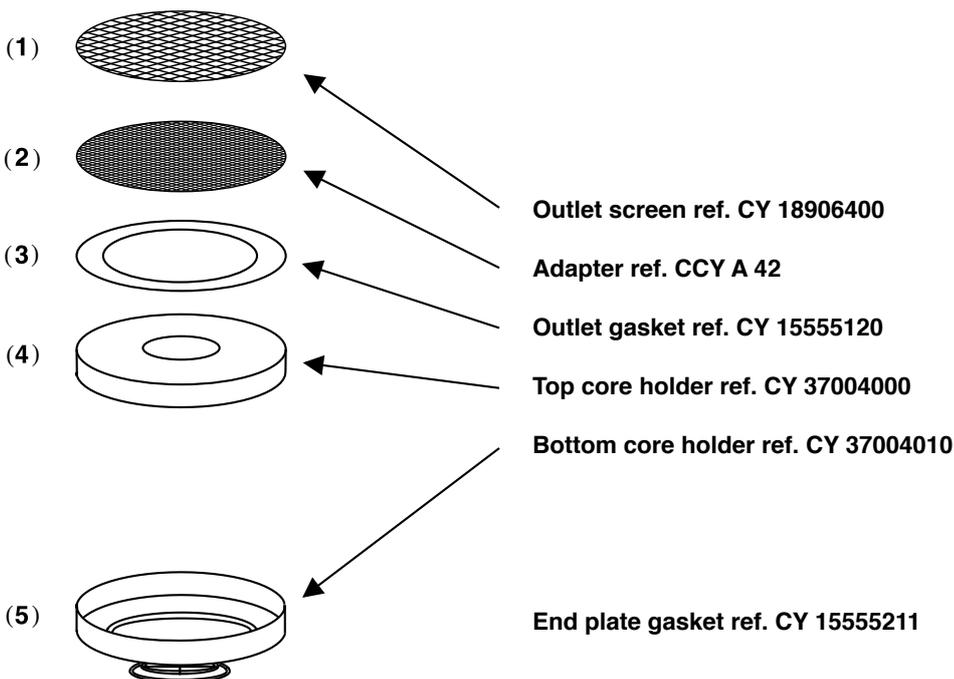


Replaceable core filter drier shells (liquid line)

→ **BDCY** (corresponding cores: CCY 42)

■ Core replacement procedure

- 1 • Isolate the **BDCY** filter drier shell.
- 2 • Purge the installation up to atmospheric pressure (shell should be empty of refrigerants)
- 3 • Remove the end plate.
- 4 • Remove the bottom core holder.
- 5 • Remove the used core.
- 6 • Clean and replace if necessary, the **CCY A 42** adapter and the outlet screen.
- 7 • Check and replace if necessary, the outlet gasket of top core holder.
- 8 • Replace systematically the end plate gasket.
- 9 • Remove the **CCY 42** core from its sealed can.
- 10 • Reassemble in order: the outlet screen (1), the **CCY A 42** adapter (2), the outlet gasket (3), the top core holder (4), the **CCY 42** core, the bottom core holder and its compression spring (5) (sketch below)
- 11 • Reinstall the closing flange making sure that the compression spring is correctly positioned and gradually and uniformly tighten the closing screws (refer to chapter 115 – **GENERAL MOUNTING PRECAUTIONS** – Criss-cross tightening). Maximum bolt tightening torque: 30 N.m.
- 12 • Make sure that the end plate's 1/4" NPT taper tapping has been properly plugged in and sealed.
- 13 • Make vacuum in the installation and check air-tightness of the whole set before putting back under pressure.





Replaceable core filter drier shells (liquid line)

➔ **BDCY** (corresponding cores: CCY 42)

■ Selection table

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾					Number of cores
				R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽²⁾	
BDCY 424 S	1/2	BDCY 424 MMS	12	19,0	17,0	12,0	19,0	22,0	1
BDCY 425 S/MMS	5/8	BDCY 425 S/MMS	16	27,0	25,0	18,0	27,0	31,0	1
BDCY 427 S/MMS	7/8	BDCY 427 S/MMS	22	45,0	41,0	29,0	44,0	51,0	1

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for $T_o = -15\text{ °C}$, $T_k = 30\text{ °C}$ and $\Delta p = 0.07\text{ bar}$.
If different conditions, refer to correction factors in chapter 112.

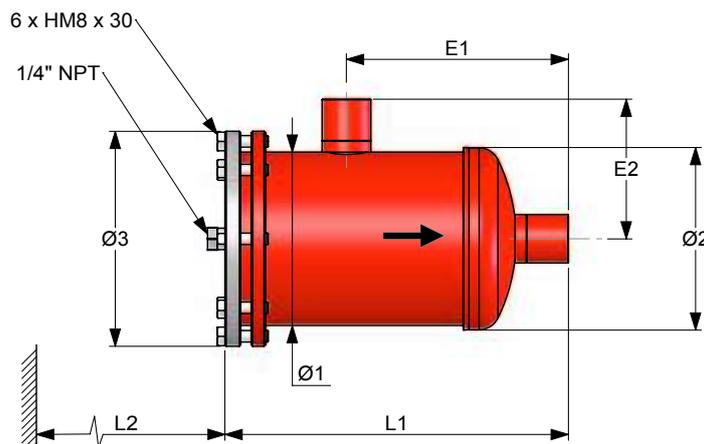
⁽²⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$
For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$, For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.

■ Technical features

CARLY references	Connection types ⁽¹⁾	Filtering surface cm ²				Dimensions mm						
		CCY 42 HP CCY 42 N	CCY 42 F	CCY 42 I	Ø1	Ø2	Ø3	L1	L2	E1	E2	
BDCY 424 S	BDCY 424 MMS	2	374	329	348	89	96	124	207	210	150	64
BDCY 425 S/MMS		2	374	329	348	89	96	124	209	210	152	66
BDCY 427 S/MMS		2	374	329	348	89	96	124	219	210	162	76

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).



CARLY references	Volume V L	Maximal working pressure PS bar	Working pressure ⁽¹⁾ PS BT bar	Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature ⁽¹⁾ TS BT °C	CE Category ⁽²⁾	
								BDCY 424 S
BDCY 425 S/MMS		1,06	42	15	100	-40	-30	Art3§3
BDCY 427 S/MMS		1,07	42	15	100	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

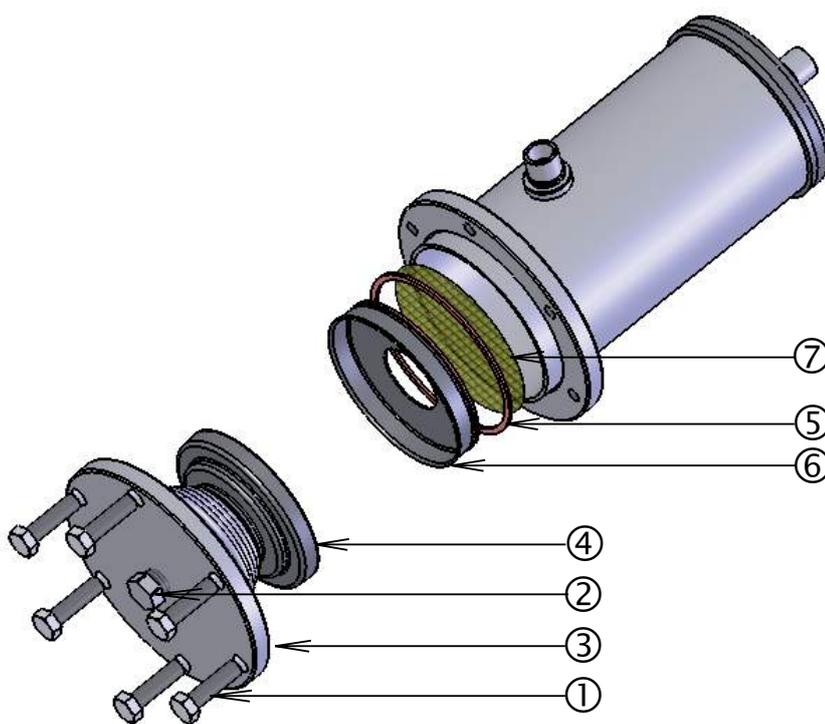


Replaceable core filter drier shells (liquid line)

→ **BDCY** (corresponding cores: CCY 42)

■ Spare parts

CARLY references	Part N°	Description	Quantity
CY 19900410	1	Set of 6 fastening screws for end plate	1
CY 10810010	2	1/4" NPT phosphate plug for end plate	1
CY 33301000	2 + 3 + 5	1/4" NPT plug + end plate + gasket	1
CY 37004010	4	Bottom core holder	1
CY 15555211	5	End plate gasket	1
CY 37004000	6	Top core holder	1
CCY A 42	7	Adapter for end core holders	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BDCY 424 S & MMS	2,85	2,60	1
BDCY 425 S/MMS	2,90	2,65	1
BDCY 427 S/MMS	2,95	2,70	1



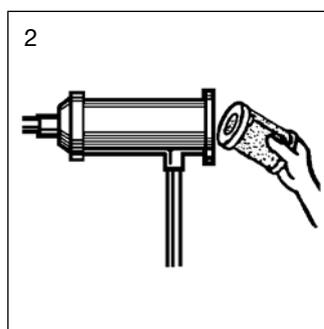
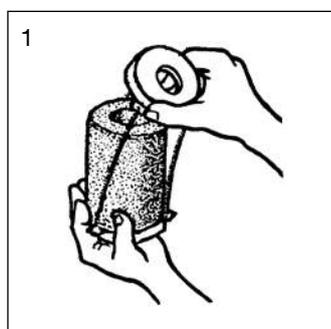
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Replaceable core filter drier shells (liquid line)

→ **BCY / BCY-HP** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Core replacement procedure

- 1 • Isolate the **BCY / BCY-HP** filter drier shell.
- 2 • Purge the installation up to atmospheric pressure (shell should be empty of refrigerants)
- 3 • Remove the end plate.
- 4 • Remove the core holders one after the other.
- 5 • Remove the used cores.
- 6 • Clean very carefully the core holders, the adapter (**CCY A 48**) and the inner part of the shell case.
- 7 • Replace systematically the gasket on the end plate and check the core holder and core end gaskets.
- 8 • Remove the core from its can and put it on the core holder, separating by traction the two flanges that hold the core holder (sketch 1)
- 9 • Repeat the operation for each core holder.
- 10 • Quickly install the core holders with their core in the shell, complying with their mounting order: the first one holds the filter elements and the last one is the one equipped with the compression spring (sketch 2)
- 11 • Reinstall the closing flange making sure that the compression spring is correctly positioned and gradually and uniformly tighten the closing screws (refer to chapter 115 – **GENERAL MOUNTING PRECAUTIONS** – Criss-cross tightening). Maximum bolt tightening torque: 30 N.m.
- 12 • Make sure that the end plate's 1/4" NPT taper tapping has been properly plugged in and sealed.
- 13 • Make vacuum in the installation and check air-tightness of the whole set before putting back under pressure.





Replaceable core filter drier shells (liquid line)

➔ **BCY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Selection table

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Refrigerating capacity KW ⁽¹⁾					Number of cores
				R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽²⁾	
BCY 485 S/MMS	5/8	BCY 485 S/MMS	16	94,0	86,0	61,0	93,0	106,0	1
BCY 487 S/MMS	7/8	BCY 487 S/MMS	22	153,0	139,0	100,0	151,0	171,0	1
BCY 489 S	1 1/8	BCY 489 MMS	28	207,0	188,0	135,0	205,0	232,0	1
BCY 4811 S/MMS	1 3/8	BCY 4811 S/MMS	35	247,0	225,0	161,0	245,0	277,0	1
BCY 4813 S	1 5/8	BCY 4813 MMS	42	300,0	273,0	195,0	297,0	336,0	1
BCY 4817 S/MMS	2 1/8	BCY 4817 S/MMS	54	350,0	319,0	228,0	347,0	392,0	1
BCY 967 S/MMS	7/8	BCY 967 S/MMS	22	157,0	143,0	102,0	155,0	176,0	2
BCY 969 S	1 1/8	BCY 969 MMS	28	235,0	214,0	153,0	233,0	264,0	2
BCY 9611 S/MMS	1 3/8	BCY 9611 S/MMS	35	334,0	304,0	217,0	331,0	375,0	2
BCY 9613 S	1 5/8	BCY 9613 MMS	42	410,0	373,0	267,0	406,0	460,0	2
BCY 9617 S/MMS	2 1/8	BCY 9617 S/MMS	54	414,0	377,0	269,0	410,0	464,0	2
BCY 1449 S	1 1/8	BCY 1449 MMS	28	375,0	341,0	244,0	371,0	420,0	3
BCY 14411 S/MMS	1 3/8	BCY 14411 S/MMS	35	400,0	364,0	260,0	396,0	448,0	3
BCY 14413 S	1 5/8	BCY 14413 MMS	42	415,0	378,0	270,0	411,0	465,0	3
BCY 14417 S/MMS	2 1/8	BCY 14417 S/MMS	54	445,0	405,0	290,0	441,0	499,0	3
BCY 19213 S	1 5/8	BCY 19213 MMS	42	525,0	478,0	342,0	520,0	588,0	4
BCY 19217 S/MMS	2 1/8	BCY 19217 S/MMS	54	560,0	510,0	364,0	554,0	628,0	4

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for $T_o = -15\text{ °C}$, $T_k = 30\text{ °C}$ and $\Delta p = 0.07\text{ bar}$.
If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$
For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$,
For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$,

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



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Replaceable core filter drier shells (liquid line)

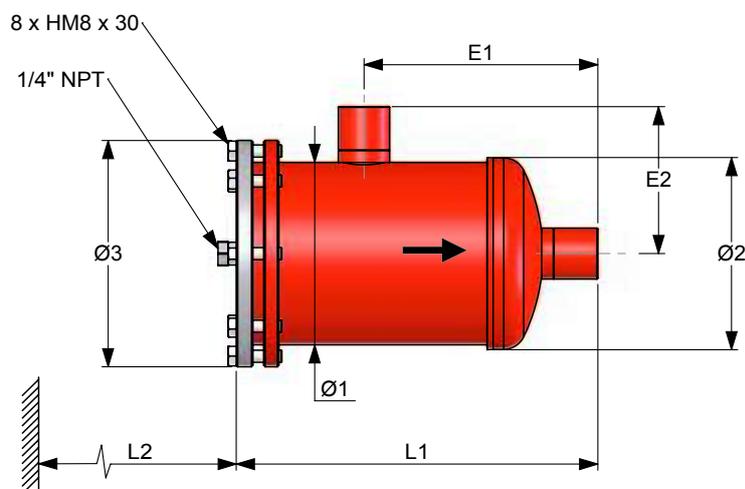
→ **BCY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Technical features

CARLY references	Connection types ⁽¹⁾	Filtering surface cm ²	Dimensions mm							
			Ø1	Ø2 ⁽²⁾	Ø3	L1	L2	E1	E2	
BCY 485 S/MMS	2	420	121	128	150	223	210	139	83	
BCY 487 S/MMS	2	420	121	128	150	233	210	149	93	
BCY 489 S	BCY 489 MMS	3	420	121	128	150	238	210	154	98
BCY 4811 S/MMS		3	420	121	128	150	247	210	163	108
BCY 4813 S	BCY 4813 MMS	3	420	121	128	150	247	210	163	108
BCY 4817 S/MMS		3	420	121	128	150	260	210	176	124
BCY 967 S/MMS		2	840	121	128	150	373	210	289	93
BCY 969 S	BCY 969 MMS	3	840	121	128	150	378	210	294	98
BCY 9611 S/MMS		3	840	121	128	150	387	210	303	108
BCY 9613 S	BCY 9613 MMS	3	840	121	128	150	387	210	303	108
BCY 9617 S/MMS		3	840	121	128	150	400	210	316	124
BCY 1449 S	BCY 1449 MMS	3	1260	121	128	150	518	210	434	98
BCY 14411 S/MMS		3	1260	121	128	150	527	210	443	108
BCY 14413 S	BCY 14413 MMS	3	1260	121	128	150	527	210	443	108
BCY 14417 S/MMS		3	1260	121	128	150	540	210	456	124
BCY 19213 S	BCY 19213 MMS	3	1680	121	128	150	672	210	588	108
BCY 19217 S/MMS		3	1680	121	128	150	685	210	601	124

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).

⁽²⁾ Including weld.





Replaceable core filter drier shells (liquid line)

➔ **BCY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Technical features

CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾	
	V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C		
BCY 485 S/MMS	1,90	35	15	100	-40	-30	I	
BCY 487 S/MMS	1,91	35	15	100	-40	-30	I	
BCY 489 S	BCY 489 MMS	1,92	35	15	100	-40	-30	I
BCY 4811 S/MMS		1,93	35	15	100	-40	-30	I
BCY 4813 S	BCY 4813 MMS	1,95	35	15	100	-40	-30	I
BCY 4817 S/MMS		2,03	35	15	100	-40	-30	I
BCY 967 S/MMS		3,30	35	15	100	-40	-30	I
BCY 969 S	BCY 969 MMS	3,30	35	15	100	-40	-30	I
BCY 9611 S/MMS		3,30	35	15	100	-40	-30	I
BCY 9613 S	BCY 9613 MMS	3,30	35	15	100	-40	-30	I
BCY 9617 S/MMS		3,40	35	15	100	-40	-30	I
BCY 1449 S	BCY 1449 MMS	4,90	35	15	100	-40	-30	I
BCY 14411 S/MMS		5,00	35	15	100	-40	-30	I
BCY 14413 S	BCY 14413 MMS	5,00	35	15	100	-40	-30	I
BCY 14417 S/MMS		5,10	35	15	100	-40	-30	I
BCY 19213 S	BCY 19213 MMS	6,40	31*	15	100	-40	-30	I
BCY 19217 S/MMS		6,40	31*	15	100	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

* 35 bar working pressure possible on demand



Replaceable core filter drier shells (liquid line)

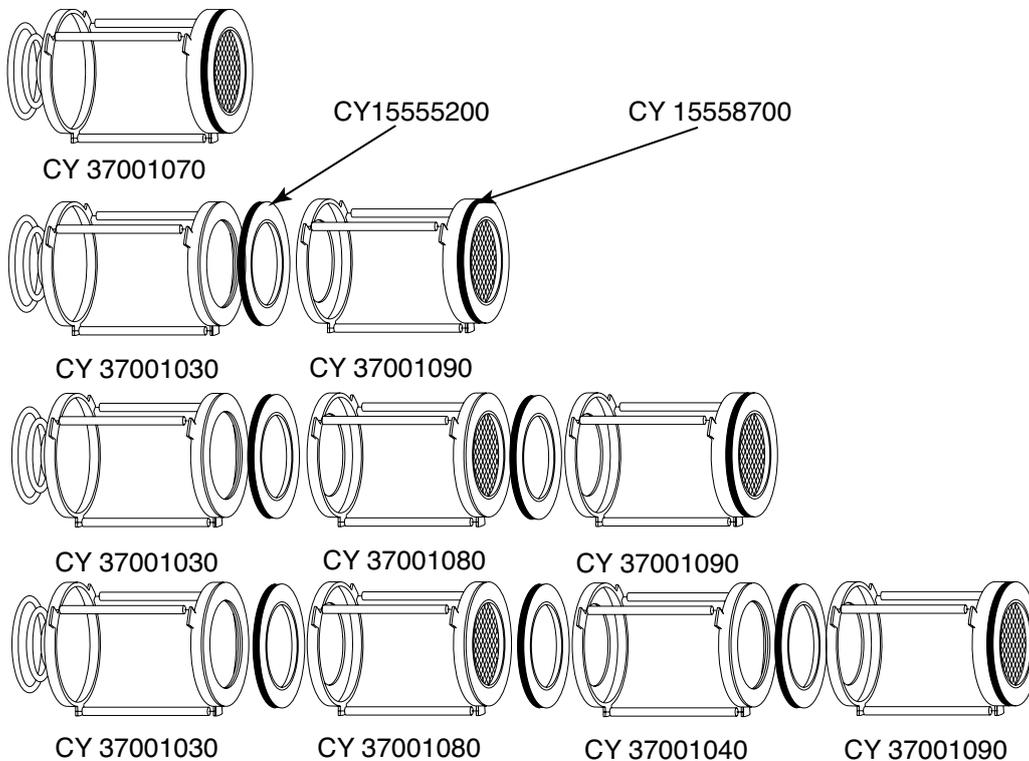
→ **BCY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Spare parts

Shells	CARLY References for core holders	Quantity and type of gaskets for use	
		Core holders gasket ⁽¹⁾	End plate gasket ⁽²⁾
BCY 1 core	CY 37001070	1 gasket CY 15558700	
BCY 2 cores	CY 37001030 + CY 37001090	1 gasket CY 15555200 + 1 gasket CY 15558700	1 gasket CY 1555601
BCY 3 cores	CY 37001030 + CY 37001080 + CY 37001090	2 gaskets CY 15555200 + 1 gasket CY 15558700	CY 1555601
BCY 4 cores	CY 37001030 + CY 37001080 + CY 37001040 + CY 37001090	3 gaskets CY 15555200 + 1 gasket CY 15558700	

⁽¹⁾ Gasket delivered with core holders

⁽²⁾ Gasket delivered with cores CCY 48 N, CCY 48 HP and PLATINIUM 48



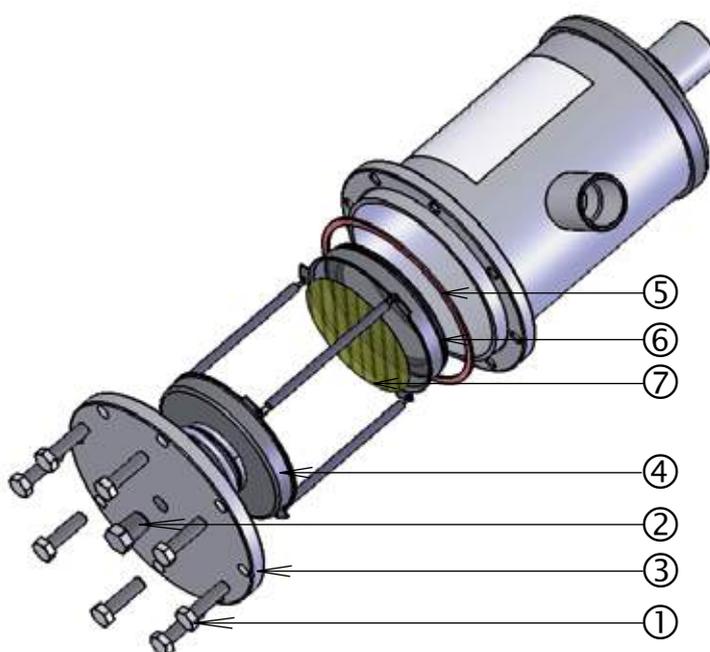


Replaceable core filter drier shells (liquid line)

➔ **BCY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Spare parts

CARLY references	Part N°	Désignation	Quantity
CY 19900411	1	Set of 8 fastening screws for end plate	1
CY 10810010	2	1/4" NPT phosphate plug for end plate	1
CY 33301200	2 + 3 + 5	1/4" NPT plug + end plate + gasket	1
CY 37001030	4	Core holder (2, 3 and 4 cores)	1
CY 37001040	4	Core holder (4 cores)	1
CY 37001070	4	Core holder (1 core)	1
CY 37001080	4	Core holder (3 and 4 cores)	1
CY 37001090	4	Core holder (2, 3 and 4 cores)	1
CY 15555601	5	End plate gasket	1
CY 15555200	6	Adhesive gasket for core holders:: CY 37001030, CY 37001040 et CY 37001080	1
CCY A 48	7	Adapter for end core holder	1
CY 15555000		Bag of gaskets for shell end plates : CARLY and for most manufacturers (gaskets: 122 x 114 x 1.6 and 114 x 103 x 1.6)	1





Replaceable core filter drier shells (liquid line)

➔ **BCY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BCY 485 S/MMS	4,45	4,20	1
BCY 487 S/MMS	4,55	4,30	1
BCY 489 S & MMS	4,65	4,40	1
BCY 4811 S/MMS	4,70	4,45	1
BCY 4813 S & MMS	4,80	4,55	1
BCY 4817 S/MMS	5,05	4,80	1
BCY 967 S/MMS	5,90	5,60	1
BCY 969 S & MMS	5,95	5,65	1
BCY 9611 S/MMS	6,15	5,85	1
BCY 9613 S & MMS	6,25	5,95	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BCY 9617 S/MMS	6,40	6,10	1
BCY 1449 S & MMS	7,20	6,85	1
BCY 14411 S/MMS	7,40	7,05	1
BCY 14413 S & MMS	7,45	7,10	1
BCY 14417 S/MMS	7,70	7,35	1
BCY 19213 S & MMS	8,65	8,25	1
BCY 19217 S/MMS	9,05	8,65	1

➔ **BCY-HP** (PS 46 bar - corresponding cores: CCY 48 and PLATINIUM 48)

■ Selection table

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾					Number of cores
				R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽²⁾	
BCY-HP 485 S/MMS	5/8	BCY-HP 485 S/MMS	16	94,0	86,0	61,0	93,0	106,0	1
BCY-HP 487 S/MMS	7/8	BCY-HP 487 S/MMS	22	153,0	139,0	100,0	151,0	171,0	1
BCY-HP 489 S	1 1/8	BCY-HP 489 MMS	28	207,0	188,0	135,0	205,0	232,0	1
BCY-HP 4811 S/MMS	1 3/8	BCY-HP 4811 S/MMS	35	247,0	225,0	161,0	245,0	277,0	1
BCY-HP 4813 S	1 5/8	BCY-HP 4813 MMS	42	300,0	273,0	195,0	297,0	336,0	1
BCY-HP 4817 S/MMS	2 1/8	BCY-HP 4817 S/MMS	54	350,0	319,0	228,0	347,0	392,0	1
BCY-HP 967 S/MMS	7/8	BCY-HP 967 S/MMS	22	157,0	143,0	102,0	155,0	176,0	2
BCY-HP 969 S	1 1/8	BCY-HP 969 MMS	28	235,0	214,0	153,0	233,0	264,0	2
BCY-HP 9611 S/MMS	1 3/8	BCY-HP 9611 S/MMS	35	334,0	304,0	217,0	331,0	375,0	2
BCY-HP 9613 S	1 5/8	BCY-HP 9613 MMS	42	410,0	373,0	267,0	406,0	460,0	2
BCY-HP 9617 S/MMS	2 1/8	BCY-HP 9617 S/MMS	54	414,0	377,0	269,0	410,0	464,0	2

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for $T_o = -15\text{ °C}$, $T_k = 30\text{ °C}$ and $\Delta p = 0.07\text{ bar}$.
If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$
For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$,
For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$,

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



Replaceable core filter drier shells (liquid line)

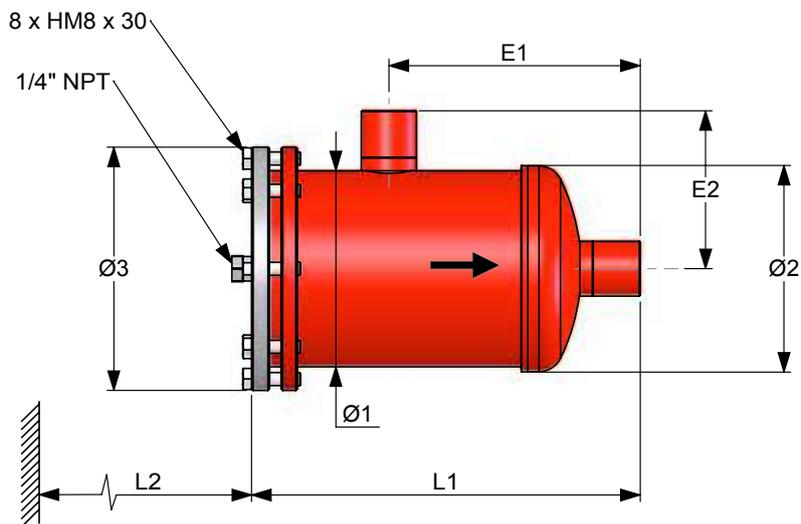
➔ BCY-HP (PS 46 bar - corresponding cores: CCY 48 and PLATINIUM 48)

■ Technical features

CARLY references	Connection types ⁽¹⁾	Filtering surface cm ²	Dimensions mm							
			Ø1	Ø2 ⁽²⁾	Ø3	L1	L2	E1	E2	
BCY-HP 485 S/MMS	2	420	121	128	150	223	210	139	83	
BCY-HP 487 S/MMS	2	420	121	128	150	233	210	149	93	
BCY-HP 489 S	BCY-HP 489 MMS	3	420	121	128	150	238	210	154	98
BCY-HP 4811 S/MMS		3	420	121	128	150	247	210	163	108
BCY-HP 4813 S	BCY-HP 4813 MMS	3	420	121	128	150	247	210	163	108
BCY-HP 4817 S/MMS		3	420	121	128	150	260	210	176	124
BCY-HP 967 S/MMS		2	840	121	128	150	373	210	289	93
BCY-HP 969 S	BCY-HP 969 MMS	3	840	121	128	150	378	210	294	98
BCY-HP 9611 S/MMS		3	840	121	128	150	387	210	303	108
BCY-HP 9613 S	BCY-HP 9613 MMS	3	840	121	128	150	387	210	303	108
BCY-HP 9617 S/MMS		3	840	121	128	150	400	210	316	124

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).

⁽²⁾ Including weld.





Replaceable core filter drier shells (liquid line)

➔ BCY-HP (PS 46 bar - corresponding cores: CCY 48 and PLATINIUM 48)

■ Technical features

CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾	
	V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C		
BCY-HP 485 S/MMS	1,90	46	15	120	-40	-30	I	
BCY-HP 487 S/MMS	1,91	46	15	120	-40	-30	I	
BCY-HP 489 S	BCY-HP 489 MMS	1,92	46	15	120	-40	-30	I
BCY-HP 4811 S/MMS		1,93	46	15	120	-40	-30	I
BCY-HP 4813 S	BCY-HP 4813 MMS	1,95	46	15	120	-40	-30	I
BCY-HP 4817 S/MMS		2,03	46	15	120	-40	-30	I
BCY-HP 967 S/MMS		3,30	46	15	120	-40	-30	I
BCY-HP 969 S	BCY-HP 969 MMS	3,30	46	15	120	-40	-30	I
BCY-HP 9611 S/MMS		3,30	46	15	120	-40	-30	I
BCY-HP 9613 S	BCY-HP 9613 MMS	3,30	46	15	120	-40	-30	I
BCY-HP 9617 S/MMS		3,40	46	15	120	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

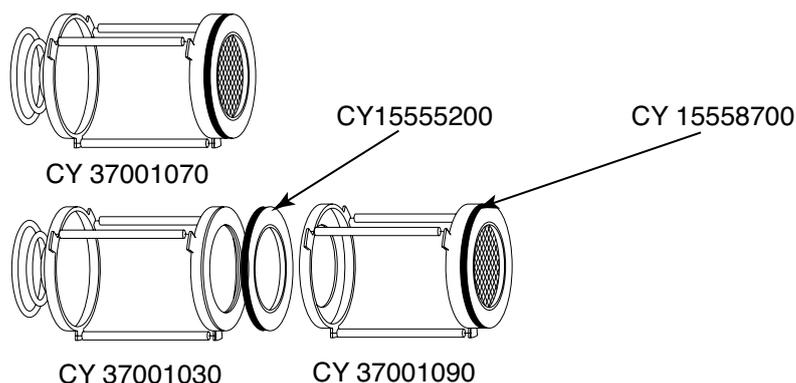
⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

■ Spare parts

Shells	CARLY References for core holders	Quantity and type of gaskets for use	
		Core holders gasket ⁽¹⁾	End plate gasket ⁽²⁾
BCY-HP 1 core	CY 37001070	1 gasket CY 15558700	1 gasket CY 1555601
BCY-HP 2 cores	CY 37001030 + CY 37001090	1 gasket CY 15555200 + 1 gasket CY 15558700	

⁽¹⁾ Gasket delivered with core holders

⁽²⁾ Gasket delivered with cores CCY 48 N, CCY 48 HP and PLATINIUM 48



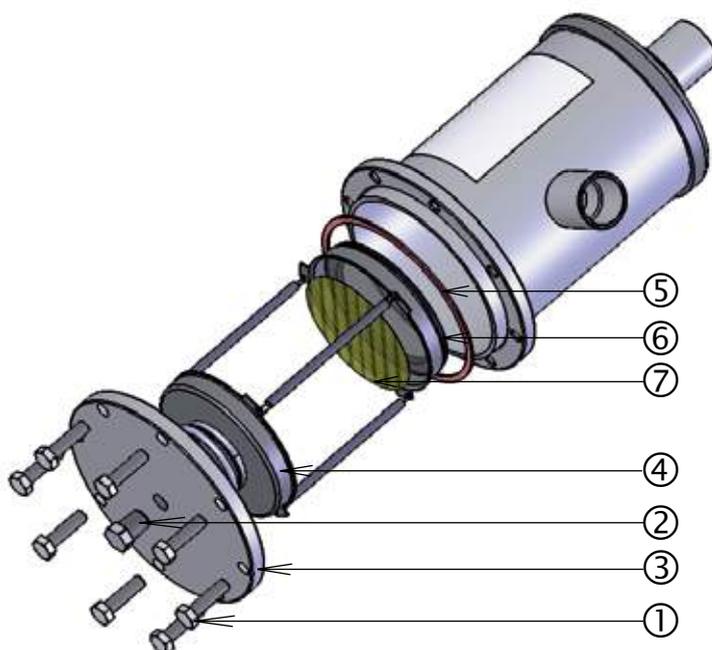


Replaceable core filter drier shells (liquid line)

➔ **BCY-HP** (PS 46 bar - corresponding cores: CCY 48 and PLATINIUM 48)

■ Spare parts

CARLY references	Part N°	Désignation	Quantity
CY 19900411	1	Set of 8 fastening screws for end plate	1
CY 10810010	2	1/4" NPT phosphate plug for end plate	1
CY 33301200	2 + 3 + 5	1/4" NPT plug + end plate + gasket	1
CY 37001030	4	Core holder (2 cores)	1
CY 37001070	4	Core holder (1 core)	1
CY 37001090	4	Core holder (2 cores)	1
CY 15555601	5	End plate gasket	1
CY 15555200	6	Adhesive gasket for core holders:: CY 37001030, CY 37001040 et CY 37001080	1
CCY A 48	7	Adapter for end core holder	1
CY 15555000		Bag of gaskets for shell end plates : CARLY and for most manufacturers (gaskets: 122 x 114 x 1.6 and 114 x 103 x 1.6)	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
BCY-HP 485 S/MMS	4,45	4,20	1	BCY-HP 967 S/MMS	5,90	5,60	1
BCY-HP 487 S/MMS	4,55	4,30	1	BCY-HP 969 S & MMS	5,95	5,65	1
BCY-HP 489 S & MMS	4,65	4,40	1	BCY-HP 9611 S/MMS	6,15	5,85	1
BCY-HP 4811 S/MMS	4,70	4,45	1	BCY-HP 9613 S & MMS	6,25	5,95	1
BCY-HP 4813 S & MMS	4,80	4,55	1	BCY-HP 9617 S/MMS	6,40	6,10	1
BCY-HP 4817 S/MMS	5,05	4,80	1				

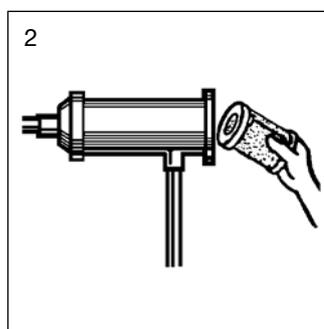
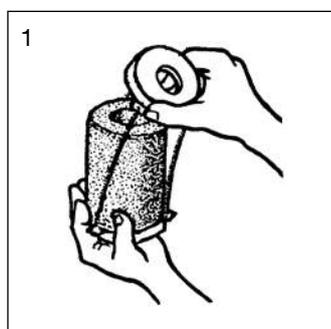


Replaceable core filter drier shells (liquid line)

→ **BBCY** (corresponding cores: CCY 100)

■ Core replacement procedure

- 1 • Isolate the **BBCY** filter drier shell.
- 2 • Purge the installation up to atmospheric pressure (shell should be empty of refrigerant)
- 3 • Remove the end plate.
- 4 • Remove the core holders one after the other.
- 5 • Remove the used cores.
- 6 • Clean very carefully the core holders, the adapter (**CCY A 100**) and the inner part of the shell case.
- 7 • Replace systematically the gasket on the end plate and check the core holder and core end gaskets.
- 8 • Remove the core from its can and put it on the core holder, separating by traction the two flanges that hold the core holder (sketch 1)
- 9 • Repeat the operation for each core holder.
- 10 • Quickly install the core holders with their core in the shell complying with their mounting order: the first one holds the filter elements and the last one is equipped with a compression spring (sketch 2)
- 11 • Reinstall the closing flange making sure that the compression spring is correctly positioned and gradually and uniformly tighten the closing screws (refer to chapter 115 – **GENERAL MOUNTING PRECAUTIONS** – Criss-cross tightening).
Maximum bolt tightening torque: 55 N.m.
- 12 • Make sure that the end plate's 1/4" NPT taper tapping has been properly plugged in and sealed.
- 13 • Make vacuum in the installation and check air-tightness of the whole set before putting back under pressure.





Replaceable core filter drier shells (liquid line)

➔ **BBCY** (corresponding cores: CCY 100)

■ Selection table

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾					Number of cores
				R22	R134a	R404A R507 R407F	R407C R410A	R744 CO ₂ ⁽²⁾	
BBCY 20017 S/MMS	2 1/8	BBCY 20017 S/MMS	54	454,0	413,0	295,0	450,0	509,0	2
BBCY 20021 S	2 5/8	BBCY 20021 MMS	67	500,0	455,0	325,0	495,0	560,0	2
BBCY 30021 S	2 5/8	BBCY 30021 MMS	67	580,0	528,0	377,0	574,0	650,0	3
BBCY 40017 S/MMS	2 1/8	BBCY 40017 S/MMS	54	591,0	538,0	385,0	586,0	662,0	4
BBCY 40021 S	2 5/8	BBCY 40021 MMS	67	700,0	637,0	456,0	693,0	784,0	4
BBCY 40025 S	3 1/8	BBCY 40025 MMS	80	840,0	765,0	547,0	832,0	941,0	4

⁽¹⁾ Refrigerating capacities according to Standard ARI 710-86 for $T_o = -15^{\circ}\text{C}$, $T_k = 30^{\circ}\text{C}$ and $\Delta p = 0.07$ bar. If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Refrigerating capacities Q_n for $T_k = -10^{\circ}\text{C}$ and $T_o = -40^{\circ}\text{C}$
 For $T_k = 0^{\circ}\text{C}$ $Q_o = Q_n + 12\%$,
 For $T_k = -20^{\circ}\text{C}$ $Q_o = Q_n - 10\%$,

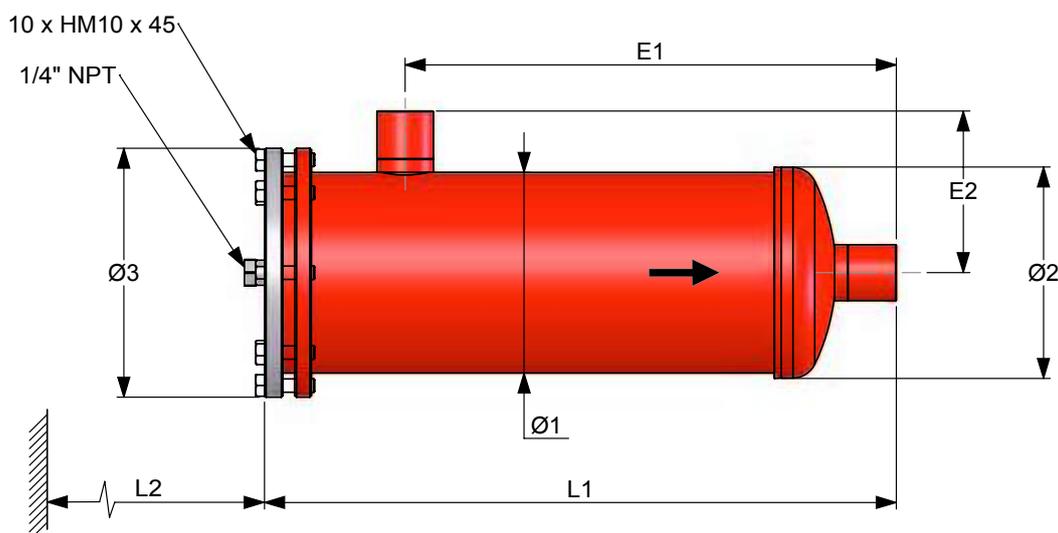
Nota: the diameter of connections must not be inferior to the diameter of the main pipe.

■ Technical features

CARLY references	Connection types ⁽¹⁾	Filtering surface cm ²	Dimensions mm						
			Ø1	Ø2 ⁽²⁾	Ø3	L1	L2	E1	E2
BBCY 20017 S/MMS	3	1260	152	156	200	544	300	402	135
BBCY 20021 S	BBCY 20021 MMS	1260	152	156	200	555	300	412	138
BBCY 30021 S	BBCY 30021 MMS	1890	152	156	200	745	300	612	138
BBCY 40017 S/MMS	3	2520	152	156	200	899	470	780	136
BBCY 40021 S	BBCY 40021 MMS	2520	152	156	200	910	470	777	138
BBCY 40025 S	BBCY 40025 MMS	2520	152	156	200	919	470	777	130

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).

⁽²⁾ Including weld.





Replaceable core filter drier shells (liquid line)

➔ **BBCY** (corresponding cores: CCY 100)

■ Technical features

CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾	
								V L
BBCY 20017 S/MMS	7,23	33	15	100	-40	-30	II	
BBCY 20021 S	BBCY 20021 MMS	7,34	33	15	100	-40	-30	II
BBCY 30021 S	BBCY 30021 MMS	10,64	33	15	100	-40	-30	II
BBCY 40017 S/MMS		13,23	33	15	100	-40	-30	II
BBCY 40021 S	BBCY 40021 MMS	13,34	33	15	100	-40	-30	II
BBCY 40025 S	BBCY 40025 MMS	13,42	33	15	100	-40	-30	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

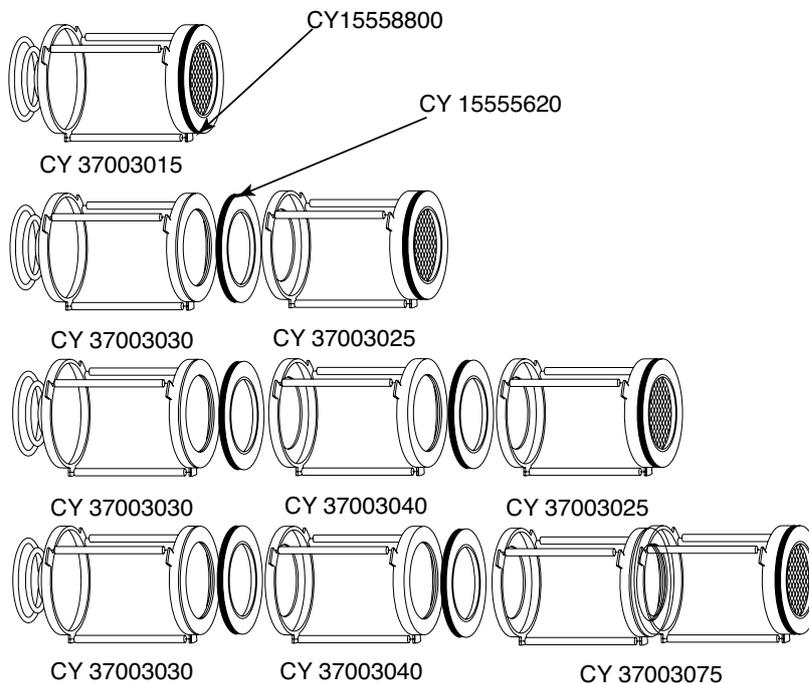
⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

■ Spare parts

Shells	CARLY References for core holders	Quantity and type of gaskets for use	
		Core holders gasket ⁽¹⁾	End plate gasket ⁽²⁾
BBCY 1 Core	CY 37003015	1 Gasket CY 15558800	
BBCY 2 Cores	CY 37003030 + CY 37003025	1 Gasket CY 15555620 + 1 Gasket CY 15558800	1 Gasket CY 15555701
BBCY 3 Cores	CY 37003030 + CY 37003040 + CY 37003025	2 Gaskets CY 15555620 + 1 Gasket CY 15558800	
BBCY 4 Cores	CY 37003030 + CY 37003040 + CY 37003075	2 Gaskets CY 15555620 + 1 Gasket CY 15558800	

⁽¹⁾ Gasket delivered with core holders

⁽²⁾ Gasket delivered with cores CCY 100 N and CCY 100 HP



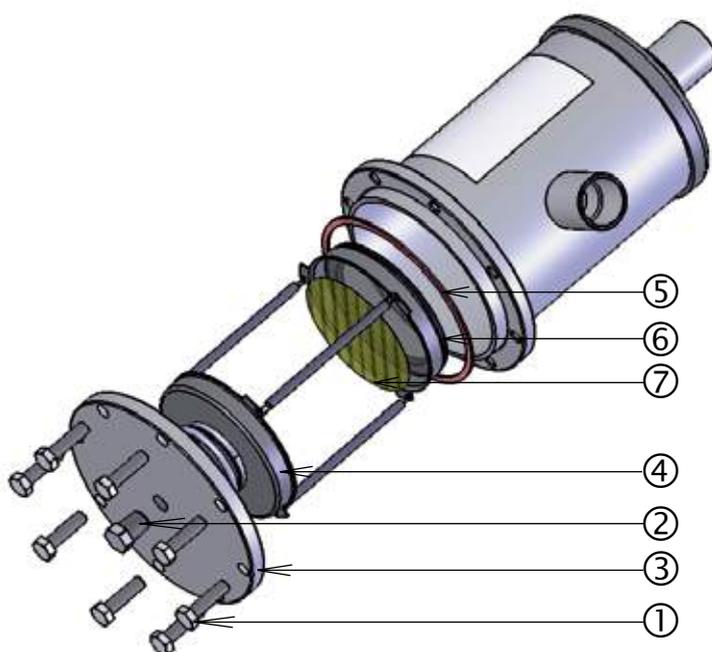


Replaceable core filter drier shells (liquid line)

➔ **BBCY** (corresponding cores: CCY 100)

■ Spare parts

CARLY references	Part N°	Description	Quantity
CY 19900520	1	Set of 10 fastening screws for end plate	1
CY 10810010	2	1/4" NPT phosphate plug for end plate	1
CY 33301700	2 + 3 + 5	1/4" NPT plug + end plate + gasket	1
CY 37003015	4	Core holder (1 core)	1
CY 37003025	4	Core holder (2 and 3 cores)	1
CY 37003030	4	Core holder (2, 3 and 4 cores)	1
CY 37003040	4	Core holder (3 and 4 cores)	1
CY 37003075	4	Core holder (4 cores)	1
CY 15555701	5	End plate gasket	1
CY 15555620	6	Adhesive gasket for core holders: CY 37003030 - CY 37003040	1
CCY A 100	7	Adapter for end core holder	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BBCY 20017 S/MMS	15,70	14,40	1
BBCY 20021 S & MMS	15,80	15,10	1
BBCY 30021 S & MMS	18,80	18,05	1
BBCY 40017 S/MMS	21,00	20,10	1
BBCY 40021 S & MMS	22,20	21,30	1
BBCY 40025 S & MMS	23,90	23,00	1



Replaceable core filter drier shells (liquid line)

→ BCY-P14 / PS 140 bar (2030 psig)

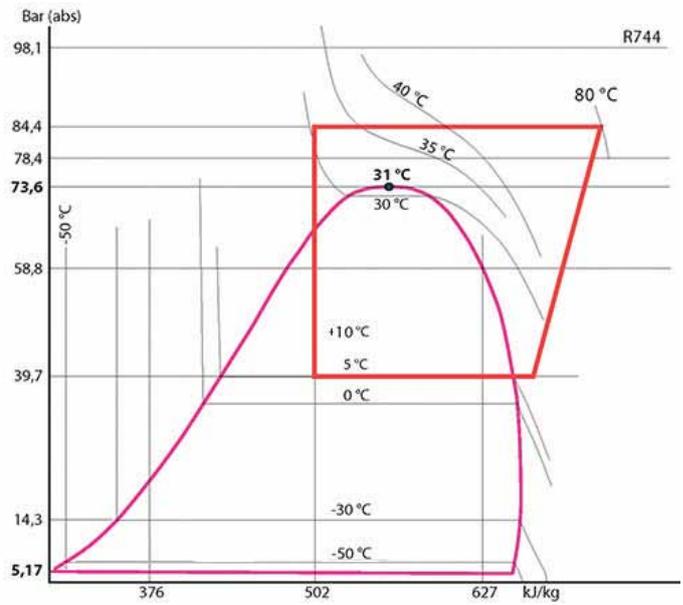
■ Applications

- Refrigerant filtering and drying and acid neutralization for refrigerating and air conditioning installation liquid lines, running in high working pressures with CO₂ in transcritical compression systems.
- Replaceable core filter drier shells allow the replacement of the filter drier's active parts only.



140 bar

CO₂ TRANSCRITICAL



■ Functional features

- Products are compatible with CO₂, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Filtering at outlet preventing the propagation within the circuit of particles bigger than 150 microns, with a very low pressure drop.
- 1/4" NPT taper tapping and its plug on end plate, allowing the installation of a pressure tap or a feeding valve.
- End plate perfectly tight thanks to its circular rim and its O-ring gasket perfectly adapted to CO₂ and to the phenomenon of explosive decompression that is possible with this refrigerant.



Possible customization on demand :

- Stainless steel casings and connections (corrosion resistance and for use at very low temperatures).
- PS 140 bar for BCY-P14 of 3 and 4 cores.

■ CARLY advantages

- Maximum working pressure : up to 140 bar for the BCY-P14 of 1 and 2 cores, with CO₂ in transcritical compression systems.
- Individual core holders treated against corrosion by zinc coating, with a reduced course for easy core replacement; therefore, replacement time is extremely reduced, limiting the time the drying cores and the inner part of the circuit are exposed to the atmosphere.
- Hermetically sealed external body made of steel to which an impregnation varnish and paint are applied to ensure a high resistance to corrosion ; this varnish ensures the internal anti-corrosion protection of the shell when it is opened for the initial set-up or during the replacement of the drying cores.
- Core holder design ensures automatic and immediate centring of the filter drier shells.
- No flow area restriction outside the filter drier shells thanks to an appropriate filtering system.
- Shell body of large dimensions in order to ensure a good spread of the refrigerant.



Replaceable core filter drier shells (liquid line)

→ BCY-P14 / PS 140 bar (2030 psig)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

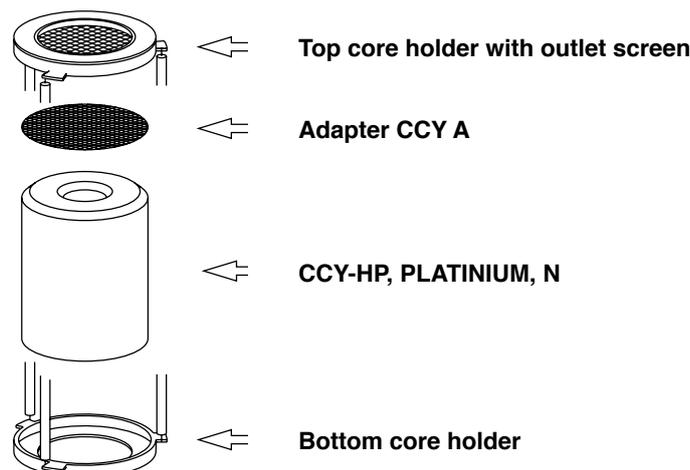
- Some are specific to each component,
- Other are general to all CARLY components,

and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;

they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Specific recommendations to replaceable core filter drier shells BCY-P14

- Filter drier shells are to be mounted on the liquid line between the receiver and the expansion element.
- The refrigerant flow direction, indicated by an arrow on the filter drier shells' tags, should be complied with.
- Assembly can be performed in any position, but not vertically with the outlet connection oriented downwards.
- During filter drier shells assembly, provide for sufficient course to allow core replacement (refer to sizes L2 in the technical features table).
- The connection to the installation, by soldering or welding, of the filter shell, must be done only after removing the closing flange, its gasket and the internal core holders.
- The O-ring gasket of the closing flange must be lubricated before its installation, with refrigerating oil compatible with the oil of the installation.
- We recommend to clean and to protect the connections of the filter drier shell with appropriate products in order to ensure a good resistance to corrosion of the affected areas.
- Be careful to properly select the solenoid valves located downstream of the filter drier shells; their oversizing could cause liquid hammer phenomena hindering the filter drier shells' proper mechanical behaviour; these liquid hammer phenomena can originate from other sources, in long-piping installations.
- Never install filter drier shells in an area of the circuit that can be isolated.
- Never trap refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- The filter drier shells' efficiency and the refrigerant's moisture content should be checked using VCYL-P liquid sight glasses.
- Make sure that the piping can support without deformation the weight of the filter drier shell ; otherwise, provide for a clamp of the filter drier shell with a clamp on a stable part of the installation.
- In case of replacement of removable elements of filter drier shells BCY-P14 (flange, screw, gasket), it is mandatory to use only identical components, suggested by CARLY in the list of spare parts at the end of this chapter.





Replaceable core filter drier shells (liquid line)

→ BCY-P14 / PS 140 bar (2030 psig)

■ Special precautions for components used with CO₂ in transcritical systems

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The implementation on the liquid line of a filter drier shell **BCY-P14** equipped with drying cores **CCY 48 HP** or **PLATINIUM 48**, is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice and even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly filter drier shells BCY-P14 do not have polymer gaskets directly in contact with CO₂.

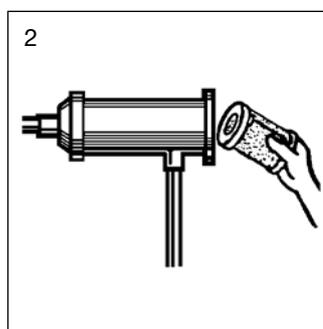
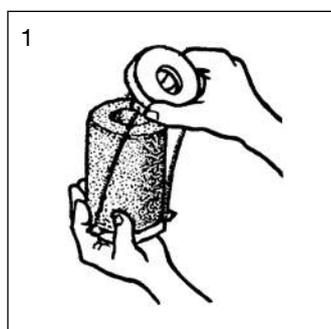


Replaceable core filter drier shells (liquid line)

→ BCY-P14 / PS 140 bar (2030 psig)

■ Core replacement procedure

- 1 • Isolate the **BCY-P14** filter drier shell.
- 2 • Purge the installation up to atmospheric pressure (shell should be empty of refrigerants)
- 3 • Remove the end plate.
- 4 • Remove the core holders one after the other.
- 5 • Remove the used cores.
- 6 • Clean very carefully the core holders, the adapter (**CCY A 48**) and the inner part of the shell case.
- 7 • Replace systematically the O-ring gasket on the end plate, and lubricate it before its installation with refrigerating oil compatible with the oil of the installation. **Warning:** this gasket is specific for this type of shell and it is not included with CCY 48 HP and PLATINIUM 48 cores; it will have to be supplied separately, its reference is indicated in the spare parts list, in the end of this chapter; check the core holder and core end gaskets.
- 8 • Remove the core from its can and put it on the core holder, separating by traction the two flanges that hold the core holder (sketch 1)
- 9 • Repeat the operation for each core holder.
- 10 • Quickly install the core holders with their core in the shell, complying with their mounting order: the first one holds the filter elements and the last one is the one equipped with the compression spring (sketch 2)
- 11 • Reinstall the closing flange making sure that the compression spring is correctly positioned and gradually and uniformly tighten the closing screws (refer to chapter 115 of CARLY technical catalogue – **GENERAL MOUNTING PRECAUTIONS** – Criss-cross tightening). Maximum bolt tightening torque: 100 N.m.
- 12 • Make sure that the end plate's 1/4" NPT taper tapping present on the clamp of the filter shell has been properly plugged in and sealed.
- 13 • Make vacuum in the installation and check air-tightness of the whole set before putting back under pressure.





Replaceable core filter drier shells (liquid line)

→ BCY-P14 / PS 140 bar (2030 psig)

■ Selection table

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Dehydratable refrigerant capacity kg of refrigerant		Number of cores
				R744 CO ₂		
				24 °C		
BCY-P14 485 S/MMS	5/8		16	34	1	
BCY-P14 487 S/MMS	7/8		22	34	1	
BCY-P14 489 S	1 1/8	BCY-P14 489 MMS	28	34	1	
BCY-P14 4811 S/MMS	1 3/8		35	34	1	
BCY-P14 4813 S	1 5/8	BCY-P14 4813 MMS	42	34	1	
BCY-P14 967 S/MMS	7/8		22	68	2	
BCY-P14 969 S	1 1/8	BCY-P14 969 MMS	28	68	2	
BCY-P14 9611 S/MMS	1 3/8		35	68	2	
BCY-P14 9613 S	1 5/8	BCY-P14 9613 MMS	42	68	2	

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



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Replaceable core filter drier shells (liquid line)

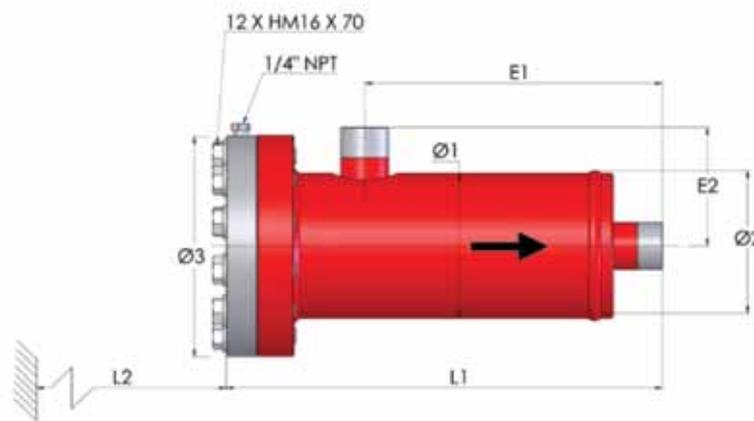
→ BCY-P14 / PS 140 bar (2030 psig)

■ Technical features

CARLY references	Connection types ⁽¹⁾	Filtering surface cm ²	Dimensions mm							
			Ø1	Ø2 ⁽²⁾	Ø3	L1	L2	E1	E2	
BCY-P14 485 S/MMS	5	420	141	146	215	263	210	129	98	
BCY-P14 487 S/MMS	5	420	141	146	215	277	210	143	115	
BCY-P14 489 S	BCY-P14 489 MMS	6	420	141	146	215	286	210	153	131
BCY-P14 4811 S/MMS		5	420	141	146	215	288	210	155	128
BCY-P14 4813 S	BCY-P14 4813 MMS	6	420	141	146	215	304	210	171	144
BCY-P14 967 S/MMS		5	840	141	146	215	417	210	283	115
BCY-P14 969 S	BCY-P14 969 MMS	6	840	141	146	215	426	210	292	131
BCY-P14 9611 S/MMS		5	840	141	146	215	428	210	295	128
BCY-P14 9613 S	BCY-P14 9613 MMS	6	840	141	146	215	444	210	311	144

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114 to CARLY technical catalogue).

⁽²⁾ Including weld.



CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾	
	V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C		
BCY-P14 485 S/MMS	2,20	140	15 *	100	-40	-30 *	II	
BCY-P14 487 S/MMS	2,20	140	15 *	100	-40	-30 *	II	
BCY-P14 489 S	BCY-P14 489 MMS	2,20	140	15 *	100	-40	-30 *	II
BCY-P14 4811 S/MMS		2,20	140	15 *	100	-40	-30 *	II
BCY-P14 4813 S	BCY-P14 4813 MMS	2,20	140	15 *	100	-40	-30 *	II
BCY-P14 967 S/MMS		3,80	140	15 *	100	-40	-30 *	II
BCY-P14 969 S	BCY-P14 969 MMS	3,80	140	15 *	100	-40	-30 *	II
BCY-P14 9611 S/MMS		3,80	140	15 *	100	-40	-30 *	II
BCY-P14 9613 S	BCY-P14 9613 MMS	3,80	140	15 *	100	-40	-30 *	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0 to CARLY technical catalogue).

* In option, possibility of maximum pressure on the full range of temperatures.



Replaceable core filter drier shells (liquid line)

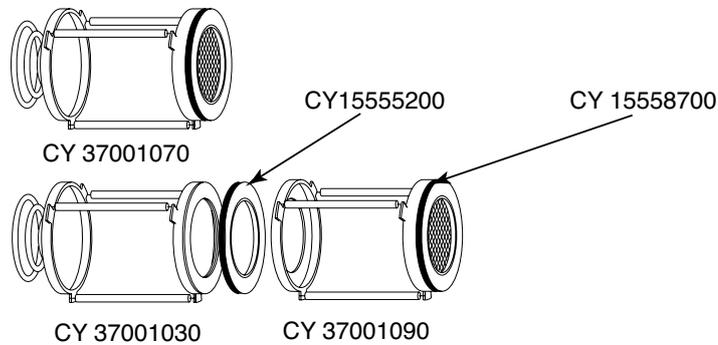
→ BCY-P14 / PS 140 bar (2030 psig)

■ Spare parts

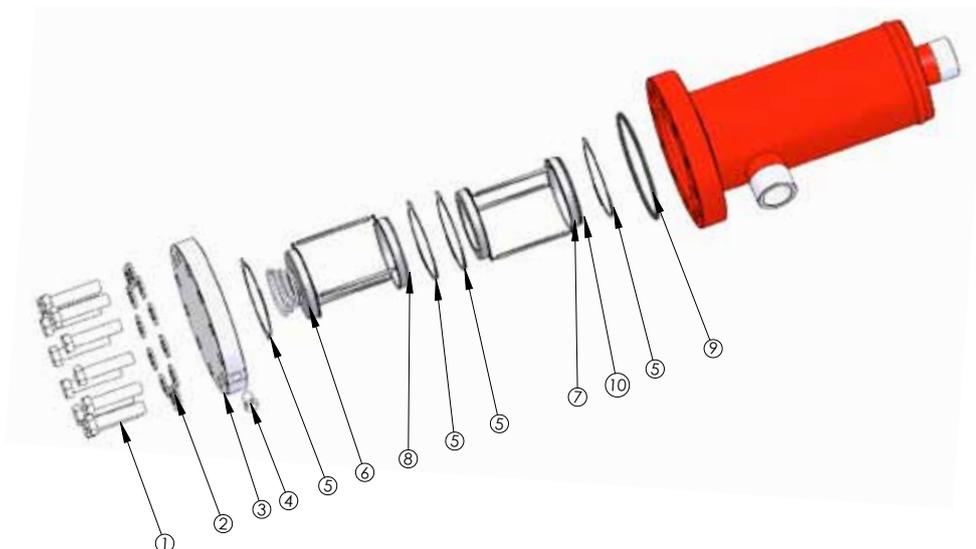
Shells	CARLY References for core holders	Quantity and type of gaskets for use	
		Core holders gasket ⁽¹⁾	End toric gasket ⁽²⁾
BCY-P14 1 core	CY 37001070	1 gasket CY 15558700	1 gasket CY 15552360
BCY-P14 2 cores	CY 37001030 + CY 37001090	1 gasket CY 15555200 +1 gasket CY 15558700	

⁽¹⁾ Gasket delivered with core holders

⁽²⁾ Gasket not delivered with cores CCY 48 N, CCY 48 HP and PLATINIUM 48



CARLY references	Part N°	Designation	Quantity
CY 19900700	1+2	Set of 12 fastening screws for end plate	1
CY 33301204	3+4+9	End plate + gasket + 1/4" NPT phosphate plug	1
CY 37001070	6	Core holder (1 core)	1
CY 37001030	6	Core holder (2 cores) Inlet	1
CY 37001090	6	Core holder (2 cores) Outlet	1
CY 11010750	5	Adapter for core holder	1
CCY A 48	7	Adapter for end core holder	1
CY 15555200	8	Adhesive gasket for core holders	1
CY 15552360	9	End torique gasket	1
CY 10810010	4	1/4" NPT phosphate plug	1
CY 15558700	10	Adhesive gasket for core holders	1





Replaceable core filter drier shells (liquid line)

→ BCY-P14 / PS 140 bar (2030 psig)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BCY-P14 485 S/MMS	23,70	22,50	1
BCY-P14 487 S/MMS	23,70	22,50	1
BCY-P14 489 S & MMS	23,70	22,50	1
BCY-P14 4811 S/MMS	23,70	22,50	1
BCY-P14 4813 S & MMS	23,70	22,50	1
BCY-P14 967 S/MMS	27,90	26,50	1
BCY-P14 969 S & MMS	27,90	26,50	1
BCY-P14 9611 S/MMS	27,90	26,50	1
BCY-P14 9613 S & MMS	27,90	26,50	1

Replaceable core filter shells (suction line)

→ BDCY / ACY / BACY

■ Applications

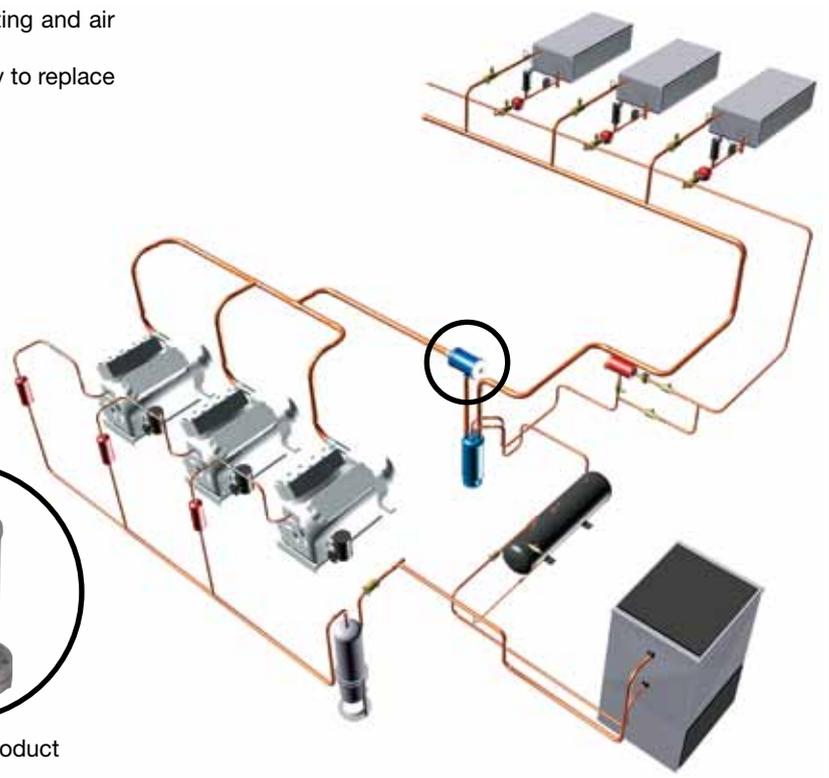
- Cleaning, decontamination and protection of refrigerating and air conditioning installation refrigerant circuits.
- Suction replaceable core filter shells give the possibility to replace only active filter parts.



Standard product



Customized product



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed external body in steel with paint to ensure a high resistance to corrosion.
- The suction filter shells also allow for CCY N cleaning cores, using CCY A adapters.
- 1/4" NPT taper tapping and its plug on end plate, allowing the installation of a pressure tap or a feeding valve.
- End plate perfectly tight thanks to its circular rim and its gasket compatible with all CFCs, HCFCs, HFCs and CO₂s.



Possible customization on demand:

- Stainless steel body and connections (Corrosion resistance and for use at very low temperature)

■ CARLY advantages

- Maximum working pressure up to 33 bars for use with R 410 A and CO₂
- Individual core holder treated against corrosion by zinc-coating, with a reduced course for core replacement; therefore, replacement time is extremely reduced, limiting drier filter cores and inner circuit part exposition times to ambient atmosphere.
- Hermetically sealed external body made of steel to which an impregnation varnish and paint are applied to ensure a high resistance to corrosion; this varnish ensures the internal anti-corrosion protection of the shell when it is opened for the initial set-up or during the replacement of the drying cores.
- Core holders are designed to ensure automatic and immediate centring of the filter shells.
- No flow area restriction outside the filter shells thanks to an appropriate filtering system.
- Low suction filter shells case footprint, for large section piping.
- In the case of use of CCY F felt filtering cores or CCY I stainless steel mesh cloth cores, the refrigerant can operate in both directions.
- GOST certified products.



Replaceable core filter shells (suction line)

→ BDCY / ACY / BACY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Specific recommendations to replaceable core suction filter shells BDCY / ACY / BACY

- Suction filter shells are to be mounted on the suction line between the evaporator and the compressor.
- The refrigerant flow direction, indicated by an arrow on the suction filter shells' tags, should be complied with, unless CCY F felt cores or CCY I stainless steel mesh cloth cores are being used.
- The mounting is performed in any position except vertically with the outlet union facing downward and as close as possible to the compressor.
- Suction filter shells should be installed so that they do not create an oil trap.
- While mounting the suction filter shells, a sufficient course should be provided to allow for core replacement (refer to sizes L2 in technical features tables).
- The connection to the installation, by soldering or welding, of the suction filter shell, must be done only after removing the closing flange, its gasket and the internal core holders.
- We recommend to clean and to protect the connections after brazing, with adapted products to insure good corrosion resistance of the affected zone.
- Make sure that the piping can stand the weight of the core filter shell without any deformation. Otherwise, plan to fix the core filter shell to a stable part of the installation with a hose clip.
- Do not forget to mount CCY A adaptors, when suction filter shells are used with CCY HP, CCY N and PLATINIUM 48 cores.
- Suction filter shells selection should take into account the integration of internal active elements (cores); this integration can be temporary or permanent.
- In order to avoid risk of frost and condensation on the suction filter shells, it is recommended to insulate them thermally.

Replaceable core filter shells (suction line)

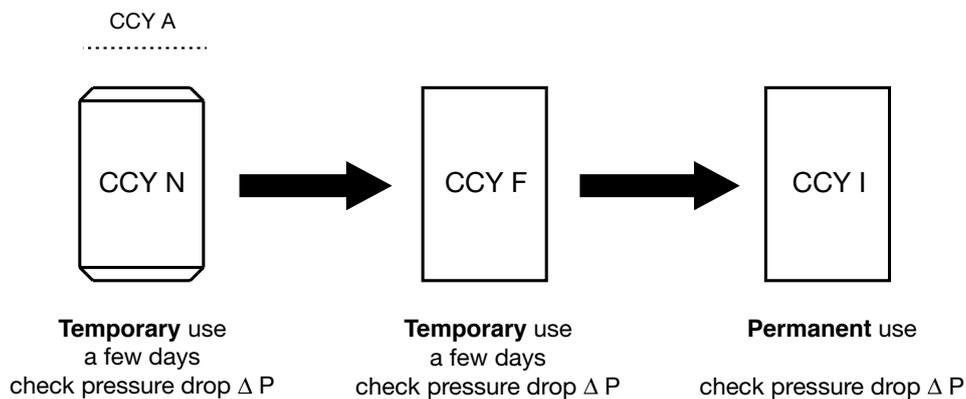
→ BDCY / ACY / BACY

■ Circuit cleaning procedure after compressor burnout for installations equipped with suction filter shells: BDCY / ACY / BACY

- 1 • According to the model, install the corresponding **CCY A** adapter in the shell (Refer to chapter 7 for the **BDCYs**, **ACYs** and **BACYs**) then the corresponding **CCY N** cleaning core(s) (refer to chapter 8).
- 2 • Let the installation run for 3 hours maximum, carefully monitoring the internal pressure drop indicating a saturation of the cores that should then be quickly replaced. This phase aims at retrieving moisture, acids, waxes and varnishes from the circuit; it is necessary to repeat it until this objective is reached (acidity and moisture monitoring).
- 3 • Replace the **CCY N** cleaning core(s) by **CCY F** felt cores after having carefully removed the **CCY A** adapter.
- 4 • Let the installation run for several days, closely monitoring the internal pressure drop, which would mean that **CCY Fs** are blocked by the contaminating agents, and should then be quickly replaced. This phase aims at eliminating all undesirable solid particles from the circuit.
- 5 • After several days of operating, replace the felt cores **CCY F** by the stainless steel mesh cloth **CCY I**, which will stay permanently on the installation to protect the compressor.

👉 It is imperative to regularly monitor the refrigerant's moisture content and condition using the sight glasses with **CARLY VCYL** or **VCYLS** moisture indicators (refer to chapters 9 or 10).

👉 Use replaceable **CCY** cores (refer to chapter 8) for refrigerating circuit cleaning, decontamination and pollution control after compressor burnout.



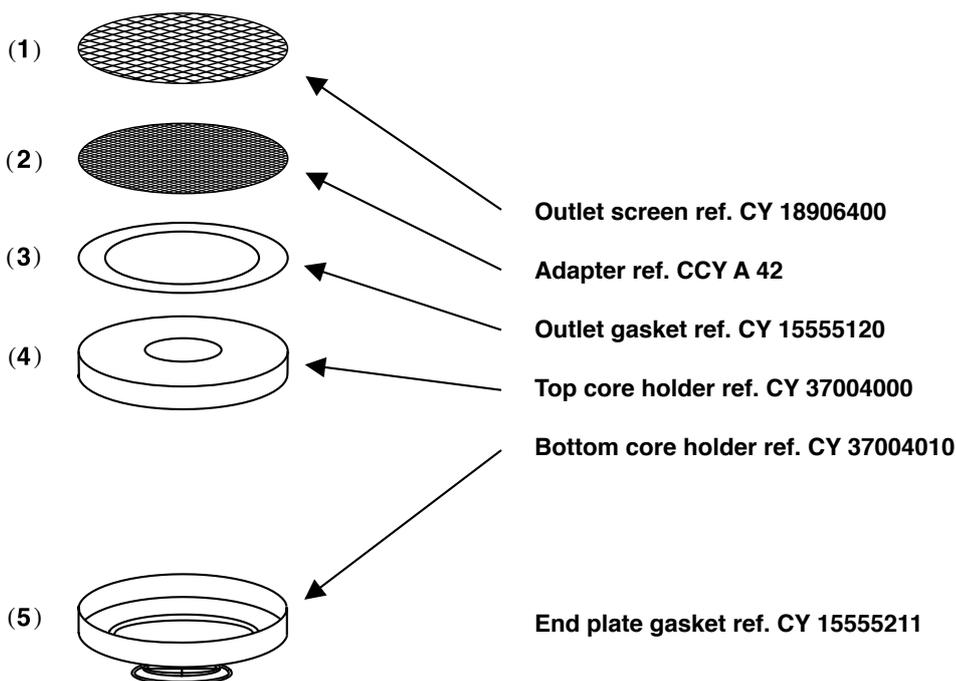


Replaceable core filter shells (suction line)

→ **BDCY** (corresponding cores: CCY 42)

■ Core replacement procedure

- 1 • Isolate the **BDCY** suction filter shell.
- 2 • Purge the installation up to atmospheric pressure (shell should be empty of refrigerants)
- 3 • Remove the end plate.
- 4 • Remove the bottom core holder.
- 5 • Remove the used core.
- 6 • The **CCY A 42** adapter should be used with **CCY 42 HP** and **CCY 42 N** cores but should imperatively be removed if **CCY 42 F** and **CCY 42 I** cores are being used.
- 7 • Clean and replace if necessary, the **CCY A 42** adapter and the outlet screen.
- 8 • Check and replace if necessary, the outlet gasket of the top core holder.
- 9 • Replace systematically the gasket on the end plate.
- 10 • Remove the **CCY 42** core from its can.
- 11 • Reassemble in order (see drawing below): the outlet screen (1), the **CCY A 42** adapter (2) if necessary, the outlet gasket (3), the top core holder (4), the **CCY 42** core, the bottom core holder and its compression spring (5)
- 12 • Reinstall the closing flange making sure that the compression spring is correctly positioned and gradually and uniformly tighten the closing screws (refer to chapter 115 – **GENERAL MOUNTING PRECAUTIONS** – Criss-cross tightening). Maximum bolt tightening torque: 30 N.m.
- 13 • Make sure that the end plate's 1/4" NPT taper tapping has been properly plugged in and sealed.
- 14 • Make vacuum in the installation and check air-tightness of the whole set before putting back under pressure.



Replaceable core filter shells (suction line)

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→ BDCY (corresponding cores: CCY 42)

■ Selection table

CARLY references	Connections To solder ODF		Refrigerating capacity kW ⁽¹⁾				Refrigerating capacity kW ⁽¹⁾					Number of cores
			Temporary use with CCY 42 N - CCY 42 F				Permanent use with CCY 42 I					
			R22 R407F	R134a	R404A R507	R407C R410A	R22 R407F	R134a	R404A R507	R407C R410A	R744 CO ₂ ⁽²⁾	
inch	mm											
BDCY 424 S	1/2		11	10	7	11	16	15	10	16	18	1
BDCY 424 MMS		12	11	10	7	11	16	15	10	16	18	1
BDCY 425 S/MMS	5/8	16	15	14	10	15	22	20	15	22	25	1
BDCY 427 S/MMS	7/8	22	22	20	15	22	42	39	28	42	48	1

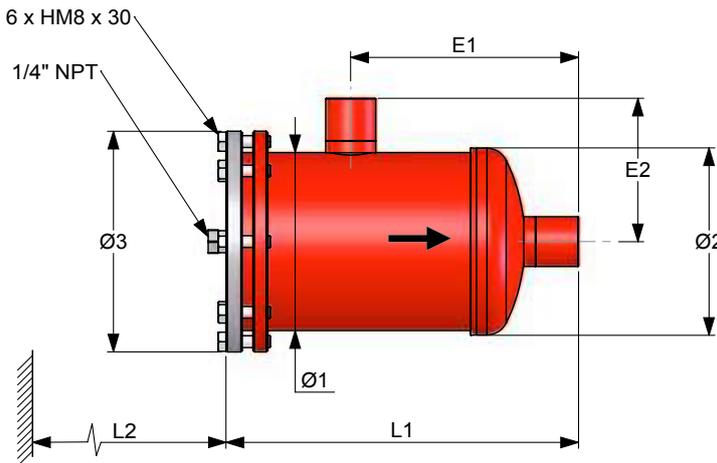
⁽¹⁾ Refrigerating capacities according to Standard ARI 730-2001 for $T_o = 4.4\text{ °C}$, $T_k = 32\text{ °C}$.
If different conditions, refer to correction factors in chapter 112.
Nota: the diameter of connections must not be inferior to the diameter of the main pipe.

⁽²⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$
For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$, For $T_o = -30\text{ °C}$ $Q_o = Q_n - 2\%$
For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$, For $T_o = -20\text{ °C}$ $Q_o = Q_n - 6\%$

■ Technical features

CARLY references	Connection types ⁽¹⁾	Filtering surface cm ²			Dimensions mm							
		CCY 42 HP CCY 42 N	CCY 42 F	CCY 42 I	Ø1	Ø2	Ø3	L1	L2	E1	E2	
BDCY 424 S	BDCY 424 MMS	2	374	329	348	89	96	124	207	210	150	64
BDCY 425 S/MMS		2	374	329	348	89	96	124	209	210	152	66
BDCY 427 S/MMS		2	374	329	348	89	96	124	219	210	162	76

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).



CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾	
								V L
BDCY 424 S	BDCY 424 MMS	1,06	42	15	100	-40	-30	Art3§3
BDCY 425 S/MMS		1,06	42	15	100	-40	-30	Art3§3
BDCY 427 S/MMS		1,07	42	15	100	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).



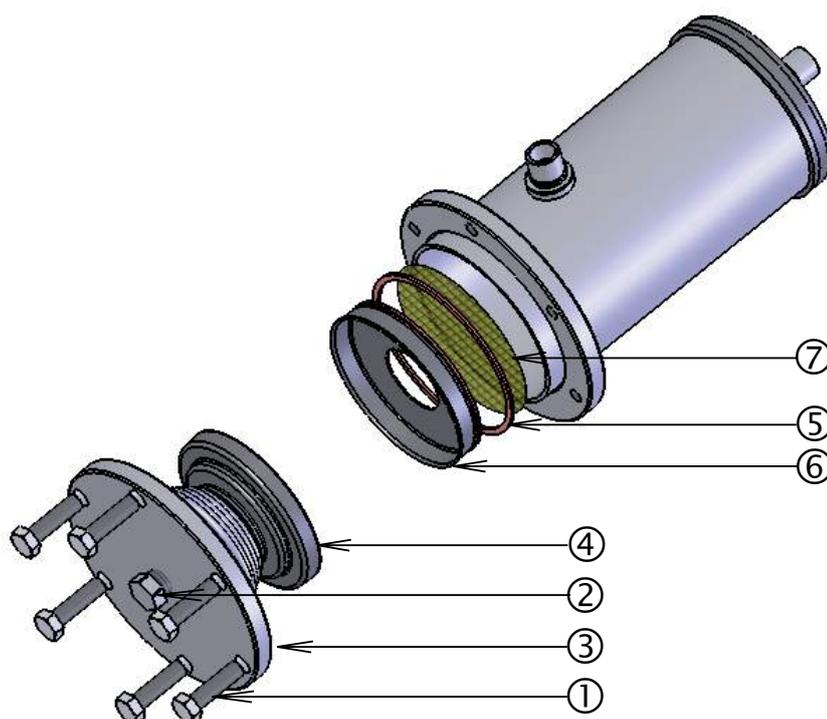
CTCY-EN – 7.1-4 / 07-2015

Replaceable core filter shells (suction line)

→ **BDCY** (corresponding cores: CCY 42)

■ Spare parts

CARLY references	Part N°	Description	Quantity
CY 19900410	1	Set of 6 fastening screws for end plate	1
CY 19900410	1	Set of 6 fastening stainless steel screws for end plate	1
CY 10810010	2	1/4" NPT phosphate plug for end plate	1
CY 33301000	2 + 3 + 5	End plate with gasket and 1/4" NPT plug	1
CY 37004010	4	Bottom core holder	1
CY 1555211	5	End plate gasket	1
CY 37004000	6	Top core holder	1
CCY A 42	7	Adapter for end core holders	1



■ Weights and packaging

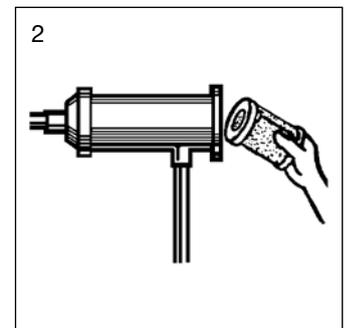
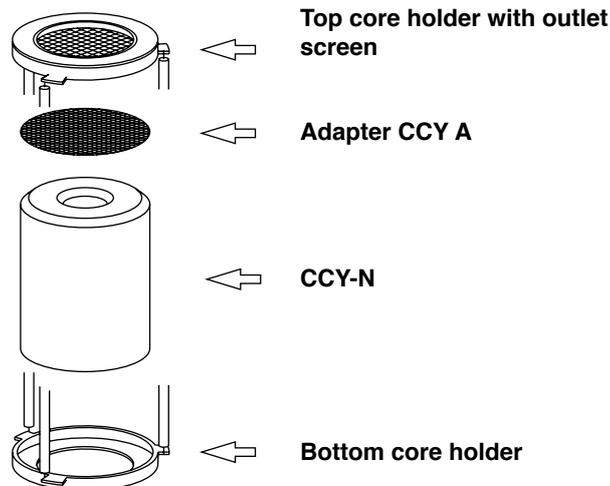
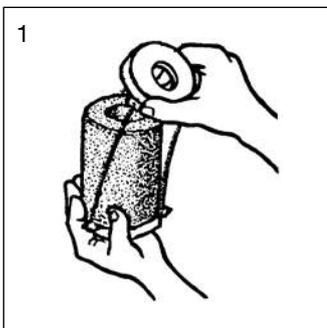
CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BDCY 424 S & MMS	2,85	2,60	1
BDCY 425 S/MMS	2,90	2,65	1
BDCY 427 S/MMS	2,95	2,70	1

Replaceable core filter shells (suction line)

→ **ACY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Core replacement procedure

- 1 • Isolate the **ACY** suction filter shell.
- 2 • Purge the installation up to atmospheric pressure (shell should be empty of refrigerants)
- 3 • Remove the end plate.
- 4 • Remove the core holders one after the other.
- 5 • Remove the used cores.
- 6 • Clean very carefully the core holders, the **CCY A 48** adapter and the inner part of the shell case.
- 7 • Replace systematically the gasket on the end plate and check core holders gaskets.
- 8 • Remove the core from its can and put it on the core holder, separating by traction the two flanges that hold the core holder (sketch 1) if necessary, install the **CCY A 48** adapter in end core holder.
- 9 • Repeat the operation for each core holder.
- 10 • Quickly install the core holders with their cores in the shell complying with their mounting order: the first one holds the screen and the adapter, if any, and the last one is equipped with a compression spring (sketch 2)
- 11 • Reinstall the closing flange making sure that the compression spring is correctly positioned and gradually and uniformly tighten the closing screws (refer to chapter 115 – **GENERAL MOUNTING PRECAUTIONS** – Criss-cross tightening). Maximum bolt tightening torque: 30 N.m.
- 12 • Make sure that the end plate's 1/4" NPT taper tapping has been properly plugged in and sealed.
- 13 • Make vacuum in the installation and check air-tightness of the whole set before putting back under pressure.





Replaceable core filter shells (suction line)

➔ **ACY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Selection table

CARLY references	Connections To solder ODF		Refrigerating capacity kW ⁽¹⁾				Refrigerating capacity kW ⁽¹⁾					Number of cores
			Temporary use with CCY 48 N - CCY 48 F				Permanent use with CCY 48 I					
			R22 R407F	R134a	R404A R507	R407C R410A	R22 R407F	R134a	R404A R507	R407C R410A	R744 CO ₂ ⁽²⁾	
inch	mm											
ACY 489 S	1 1/8		51	46	33	50	83	76	54	83	93	1
ACY 489 MMS		28	51	46	33	50	83	76	54	83	93	1
ACY 4811 S/MMS	1 3/8	35	60	55	39	60	101	92	66	100	114	1
ACY 4813 S	1 5/8		67	61	44	66	119	108	78	118	134	1
ACY 4813 MMS		42	67	61	44	66	119	108	78	118	134	1
ACY 4817 S/MMS	2 1/8	54	73	67	48	73	144	131	94	142	162	1
ACY 4821 S	2 5/8		80	73	52	79	173	158	113	171	194	1
ACY 4821 MMS		67	80	73	52	79	173	158	113	171	194	1
ACY 4825 S	3 1/8		86	78	56	85	178	162	116	176	200	1
ACY 4825 MMS		80	86	78	56	85	178	162	116	176	200	1
ACY 9617 S/MMS	2 1/8	54	100	91	65	99	176	160	115	174	198	2
ACY 9621 S	2 5/8		103	94	67	102	202	184	131	200	227	2
ACY 9621 MMS		67	103	94	67	102	202	184	131	200	227	2
ACY 9625 S	3 1/8		107	97	70	106	254	231	165	251	285	2
ACY 9625 MMS		80	107	97	70	106	254	231	165	251	285	2
ACY 19217 S/MMS	2 1/8	54	130	119	85	129	214	195	140	212	240	4
ACY 19221 S	2 5/8		135	123	88	134	249	227	162	246	279	4
ACY 19221 MMS		67	135	123	88	134	249	227	162	246	279	4
ACY 19225 S	3 1/8		144	131	94	143	313	286	204	311	351	4
ACY 19225 MMS		80	144	131	94	143	313	286	204	311	351	4

⁽¹⁾ Refrigerating capacities according to Standard ARI 730-2001 for $T_o = 4.4\text{ °C}$, $T_k = 32\text{ °C}$.
If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$
For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$,
For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$.

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



Replaceable core filter shells (suction line)

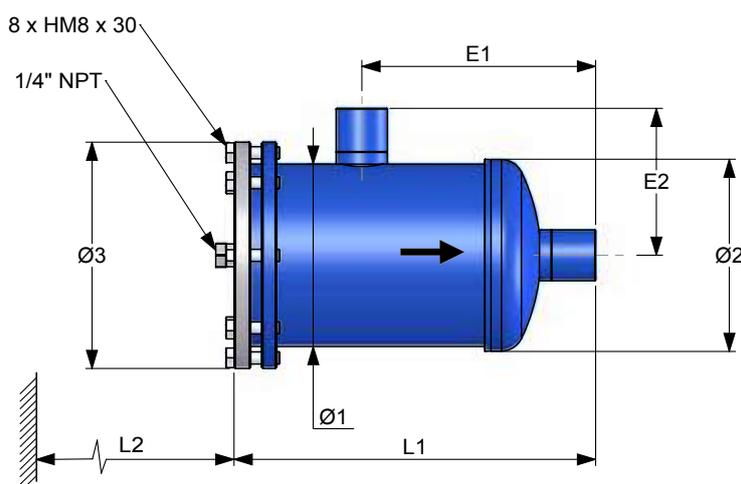
➔ **ACY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Technical features

CARLY references		Connection types ⁽¹⁾	Filtering surface cm ²	Dimensions mm						
				Ø1	Ø2 ⁽²⁾	Ø3	L1	L2	E1	E2
ACY 489 S	ACY 489 MMS	3	420	121	128	150	238	210	154	98
ACY 4811 S/MMS		3	420	121	128	150	247	210	163	108
ACY 4813 S	ACY 4813 MMS	3	420	121	128	150	247	210	163	108
ACY 4817 S/MMS		3	420	121	128	150	260	210	176	124
ACY 4821 S	ACY 4821 MMS	3	420	121	128	150	270	210	182	128
ACY 4825 S	ACY 4825 MMS	3	420	121	128	150	280	210	189	132
ACY 9617 S/MMS		3	840	121	128	150	400	210	316	124
ACY 9621 S	ACY 9621 MMS	3	840	121	128	150	410	210	322	128
ACY 9625 S	ACY 9625 MMS	3	840	121	128	150	420	210	329	132
ACY 19217 S/MMS		3	1260	121	128	150	685	210	601	124
ACY 19221 S	ACY 19221 MMS	3	1680	121	128	150	695	210	607	128
ACY 19225 S	ACY 19225 MMS	3	1680	121	128	150	705	210	614	132

⁽¹⁾ Chapter "Connection features and drawings" (refer to chapter 114).

⁽²⁾ Including weld.





Replaceable core filter shells (suction line)

➔ **ACY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Technical features

CARLY references		Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
ACY 489 S	ACY 489 MMS	1,92	33	15	80	-40	-30	I
ACY 4811 S/MMS		1,93	33	15	80	-40	-30	I
ACY 4813 S	ACY 4813 MMS	1,95	33	15	80	-40	-30	I
ACY 4817 S/MMS		2,04	33	15	80	-40	-30	I
ACY 4821 S	ACY 4821 MMS	2,18	33	15	80	-40	-30	I
ACY 4825 S	ACY 4825 MMS	2,30	33	15	80	-40	-30	I
ACY 9617 S/MMS		3,40	33	15	80	-40	-30	I
ACY 9621 S	ACY 9621 MMS	3,60	33	15	80	-40	-30	I
ACY 9625 S	ACY 9625 MMS	3,70	33	15	80	-40	-30	I
ACY 19217 S/MMS		6,50	29 *	15	80	-40	-30	I
ACY 19221 S	ACY 19221 MMS	6,70	29 *	15	80	-40	-30	I
ACY 19225 S	ACY 19225 MMS	6,80	29 *	15	80	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

* 33 bar working pressure possible on demand



Replaceable core filter shells (suction line)

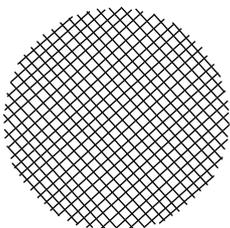
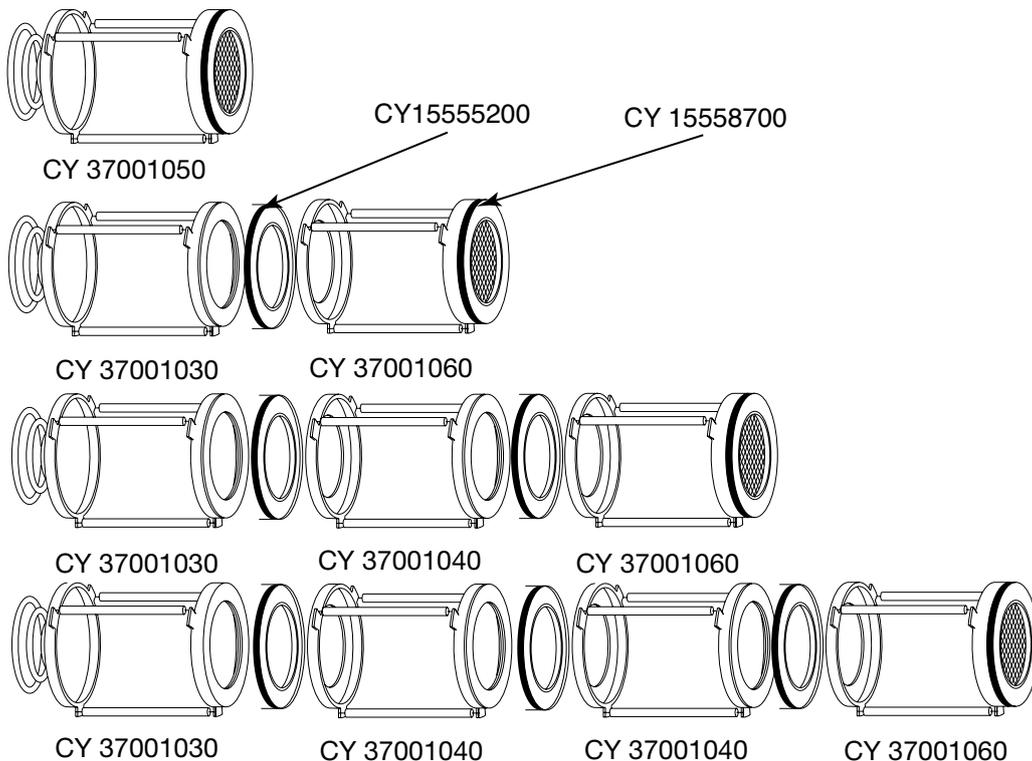
➔ **ACY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Core holders and gaskets

Shells	CARLY References for core holders	Quantity and type of gaskets for use	
		Core holders gasket ⁽¹⁾	End plate gasket ⁽²⁾
ACY 1 core	CY 37001050	1 gasket CY 15558700	
ACY 2 cores	CY 37001030 + CY 37001060	1 gasket CY 15555200 +1 gasket CY 15558700	1 gasket CY 1555601
ACY 3 cores	CY 37001030 + CY 37001040 + CY 37001060	2 gaskets CY 15555200 +1 gasket CY 15558700	1 gasket CY 1555601
ACY 4 cores	CY 37001030 + CY 37001040 + CY 37001040 + CY 37001060	3 gaskets CY 15555200 +1 gasket CY 15558700	

⁽¹⁾ Gasket delivered with core holders

⁽²⁾ Gasket delivered with cores CCY 48 HP, CCY 48 N, CCY 48 I, CCY 48 F and PLATINIUM 48



- Outlet filter adapter for ACY:
CCY A 48 (To use with cores CCY 48 HP, PLATINIUM 48 and CCY 48 N).
- The adapter **CCY A 48** shall be installed in top flange of core holder:
CY 37001050 for one core ACY and
CY 37001060 for several cores ACY.

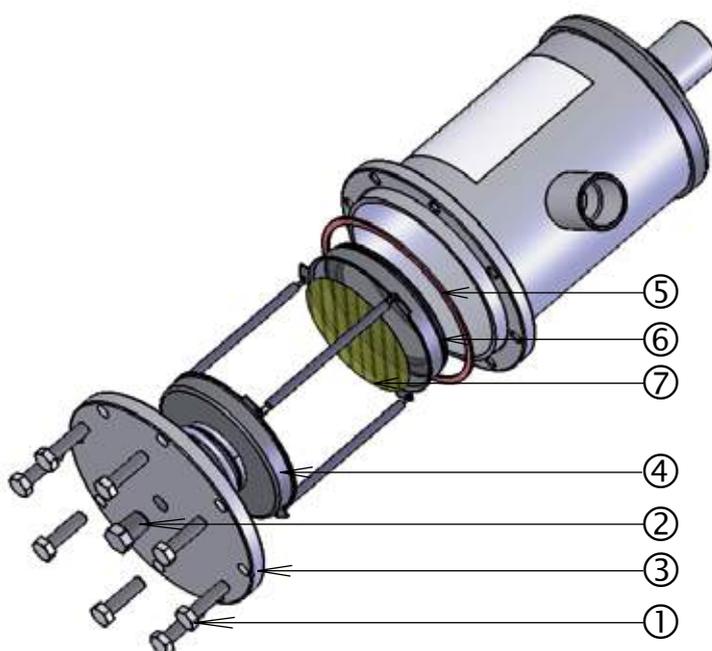


Replaceable core filter shells (suction line)

→ **ACY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Spare parts

CARLY references	Part N°	Description	Quantity
CY 19900411	1	Set of 8 fastening screws for end plate	1
CY 19910411	1	Set of 8 fastening stainless steel screws for end plate	1
CY 10810010	2	1/4" NPT phosphate plug for end plate	1
CY 33301200	2 + 3 + 5	End plate with gasket and 1/4" NPT plug	1
CY 37001030	4	Core holder (2, 3 and 4 cores)	1
CY 37001040	4	Core holder (3 and 4 cores)	1
CY 37001050	4	Core holder (1 core)	1
CY 37001060	4	Core holder (2, 3 and 4 cores)	1
CY 15555601	5	End plate gasket	1
CY 15555200	6	Adhesive gasket for core holders : CY 37001030 and CY 37001040	1
CCY A 48	7	Adapter for end core holder	1
CY 15555000		Bag of gaskets for shell end plates : CARLY and for most manufacturers (gaskets: 122 x 114 x 1.6 and 114 x 103 x 1.6)	1





Replaceable core filter shells (suction line)

➔ **ACY** (corresponding cores: CCY 48 and PLATINIUM 48)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
ACY 489 S & MMS	4,60	4,35	1
ACY 4811 S/MMS	4,70	4,45	1
ACY 4813 S & MMS	4,85	4,60	1
ACY 4817 S/MMS	5,05	4,80	1
ACY 4821 S & MMS	5,45	5,20	1
ACY 4825 S & MMS	5,75	5,50	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
ACY 9617 S/MMS	6,70	6,40	1
ACY 9621 S & MMS	6,85	6,55	1
ACY 9625 S & MMS	7,15	6,85	1
ACY 19217 S/MMS	8,90	8,50	1
ACY 19221 S & MMS	9,60	9,20	1
ACY 19225 S & MMS	9,90	9,50	1

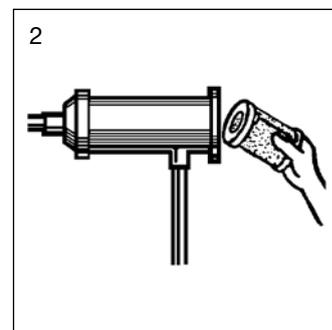
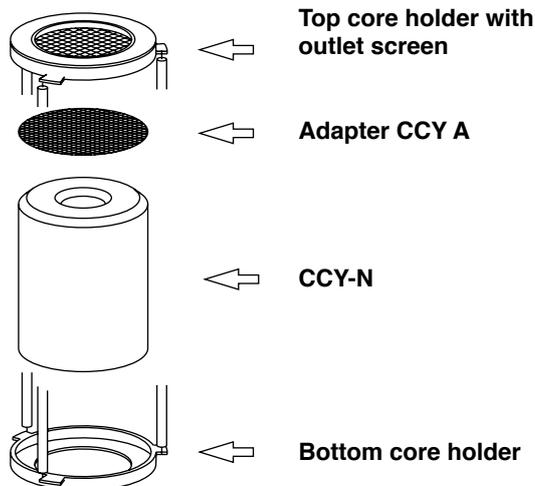
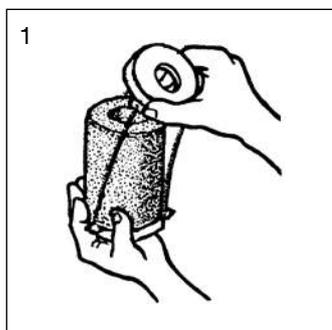


Replaceable core filter shells (suction line)

→ **BACY** (corresponding cores: CCY 100)

■ Core replacement procedure

- 1 • Isolate the **BACY** suction filter shell.
- 2 • Purge the installation up to atmospheric pressure (shell should be empty of refrigerant)
- 3 • Remove the end plate.
- 4 • Remove the core holders one after the other.
- 5 • Remove the used cores.
- 6 • Clean very carefully the core holders, the **CCY A 100** adapter and the inner part of the shell.
- 7 • Replace systematically the gasket on the end plate and check core holders gaskets.
- 8 • Remove the core from its can and put it on the core holder, separating by means of traction, if necessary, the two flanges that hold the core holder (sketch 1), install the **CCY A 100** adapter in the end core holder.
- 9 • Repeat the operation for each core holder.
- 10 • Quickly install the core holders with their cores in the shell, complying with their mounting order: the first one holds the screen and the adapter, if any, and the last one is equipped with a compression spring (sketch 2)
- 11 • Reinstall the closing flange making sure that the compression spring is correctly positioned and gradually and uniformly tighten the closing screws (refer to chapter 115 – **GENERAL MOUNTING PRECAUTIONS** – Criss-cross tightening). Maximum bolt tightening torque: 55 N.m.
- 12 • Make sure that the end plate 1/4" NPT taper tapping has been properly plugged in and sealed.
- 13 • Make vacuum in the installation and check air-tightness of the whole set before putting back under pressure.





Replaceable core filter shells (suction line)

➔ **BACY** (corresponding cores: CCY 100)

■ Selection table

CARLY references	Connections To solder ODF		Refrigerating capacity kW ⁽¹⁾				Refrigerating capacity kW ⁽¹⁾					Number of cores
			Temporary use with CCY 100 N - CCY 100 F				Permanent use with CCY 100 I					
			R22 R407F	R134a	R404A R507	R407C R410A	R22 R407F	R134a	R404A R507	R407C R410A	R744 CO ₂ ⁽²⁾	
inch	mm											
BACY 10021 S	2 5/8		96	88	63	96	221	202	144	219	248	1
BACY 10021 MMS		67,0	96	88	63	96	221	202	144	219	248	1
BACY 10025 S	3 1/8		108	99	71	107	230	210	150	228	258	1
BACY 10025 MMS		80,0	108	99	71	107	230	210	150	228	258	1
BACY 10029 S	3 5/8		139	127	91	138	301	274	196	298	338	1
BACY 10029 MMS		88,9	139	127	91	138	301	274	196	298	338	1
BACY 10033 S	4 1/8		191	175	124	189	404	368	263	400	453	1
BACY 10033 MMS		108,0	191	175	124	189	404	368	263	400	453	1
BACY 20025 S	3 1/8		143	130	93	141	313	285	204	310	351	2
BACY 20029 S	3 5/8		183	166	119	181	398	363	260	394	446	2
BACY 20029 MMS		88,9	183	166	119	181	398	363	260	394	446	2
BACY 20033 S	4 1/8		255	232	166	252	530	482	345	524	594	2
BACY 20033 MMS		108,0	255	232	166	252	530	482	345	524	594	2
BACY 40033 S	4 1/8		293	266	191	164	670	610	436	663	751	4
BACY 40033 MMS		108,0	293	266	191	164	670	610	436	663	751	4

⁽¹⁾ Refrigerating capacities according to Standard ARI 730-2001 for To = 4.4 °C, Tk = 32 °C.
If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Refrigerating capacities Qn for Tk = -10 °C and To = -40 °C
For Tk = 0 °C Qo = Qn + 12 %,
For Tk = -20 °C Qo = Qn - 10 %.

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



Replaceable core filter shells (suction line)

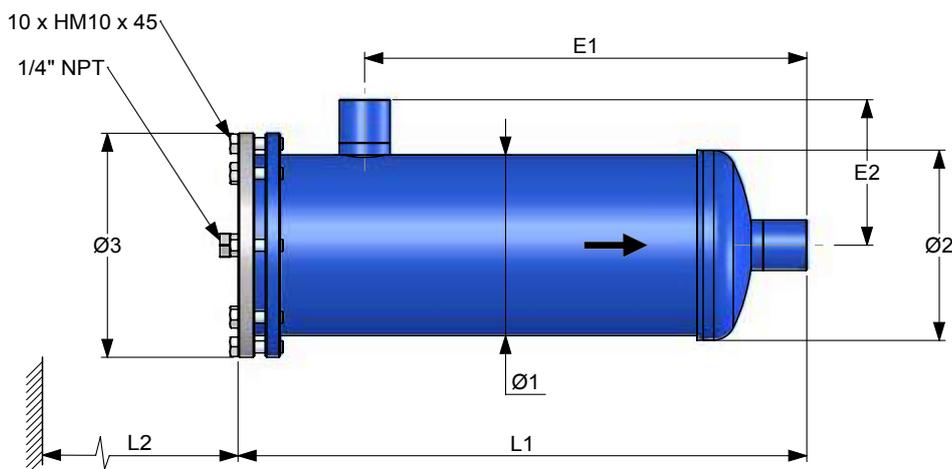
→ **BACY** (corresponding cores: CCY 100)

■ Technical features

CARLY references		Connection types ⁽¹⁾	Filtering surface cm ²	Dimensions mm						
				Ø1	Ø2 ⁽²⁾	Ø3	L1	L2	E1	E2
BACY 10021 S	BACY 10021 MMS	3	630	152	156	200	385	300	242	138
BACY 10025 S	BACY 10025 MMS	3	630	152	156	200	394	300	252	130
BACY 10029 S	BACY 10029 MMS	3	630	152	156	200	398	300	256	141
BACY 10033 S	BACY 10033 MMS	3	630	152	156	200	404	300	262	144
BACY 20025 S	BACY 20025 MMS	3	1260	152	156	200	564	300	422	130
BACY 20029 S	BACY 20029 MMS	3	1260	152	156	200	568	300	426	141
BACY 20033 S	BACY 20033 MMS	3	1260	152	156	200	574	300	432	144
BACY 40033 S	BACY 40033 MMS	3	2520	152	156	200	929	470	777	144

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).

⁽²⁾ Including weld



CARLY references		Volume V L	Maximal working pressure PS bar	Working pressure ⁽¹⁾ PS BT bar	Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature ⁽¹⁾ TS BT °C	CE Category ⁽²⁾
BACY 10025 S	BACY 10025 MMS	4,92	33	15	80	-40	-30	I
BACY 10029 S	BACY 10029 MMS	5,05	33	15	80	-40	-30	I
BACY 10033 S	BACY 10033 MMS	5,28	33	15	80	-40	-30	I
BACY 20025 S	BACY 20025 MMS	7,42	25 *	15	80	-40	-30	I
BACY 20029 S	BACY 20029 MMS	7,55	25 *	15	80	-40	-30	I
BACY 20033 S	BACY 20033 MMS	7,78	25 *	15	80	-40	-30	I
BACY 40033 S	BACY 40033 MMS	13,78	33	15	80	-40	-30	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

* 33 bar working pressure possible on demand.



Replaceable core filter shells (suction line)

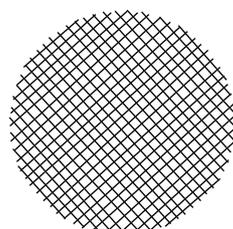
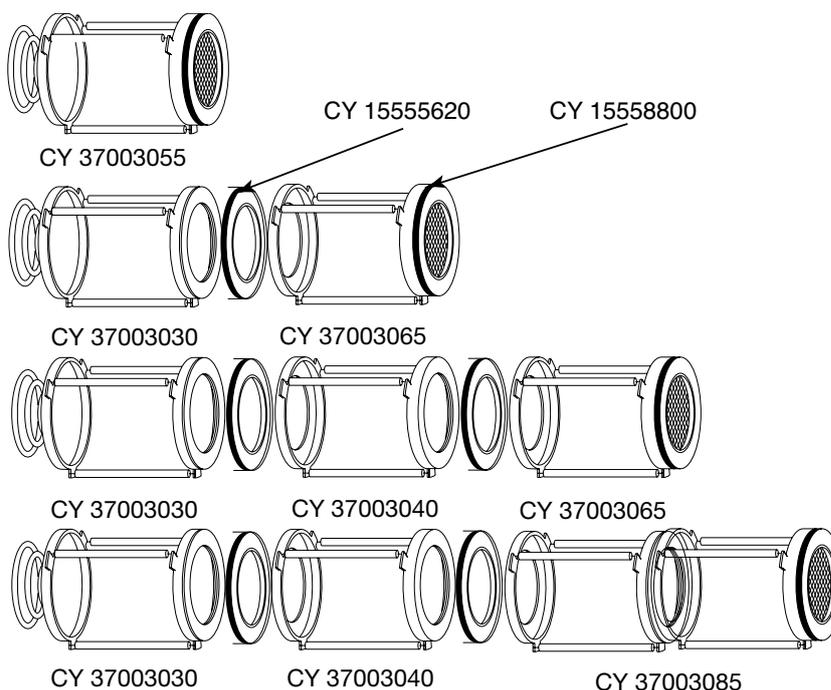
→ BACY (corresponding cores: CCY 100)

■ Spare parts

Shells	CARLY References for core holders	Quantity and type of gaskets for use	
		Core holders gasket ⁽¹⁾	End plate gasket ⁽²⁾
BACY 1 Core	CY 37003055	1 Gasket CY 15558800	
BACY 2 Cores	CY 37003030 + CY 37003065	1 Gasket CY 15555620 +1 Gasket CY 15558800	1 Gasket CY 15555701
BACY 3 Cores	CY 37003030 + CY 37003040 + CY 37003065	2 Gaskets CY 15555620 +1 Gasket CY 15558800	
BACY 4 Cores	CY 37003030 + CY 37003040 + CY 37003085	2 Gaskets CY 15555620 +1 Gasket CY 15558800	

⁽¹⁾ Gasket delivered with core holders

⁽²⁾ Gasket delivered with cores CCY 100 HP, CCY 100 N, CCY 100 I and CCY 100 F



- Outlet filter adapter for BACY:
CCY A 100 (To use with cores CCY 100 HP and CCY 100 N)
- The adapter **CCY A 100** shall be installed in top flange of core holder CY 37001055 for one core BACY and CY 37003065 and CY 37003085 and for several cores BACY.

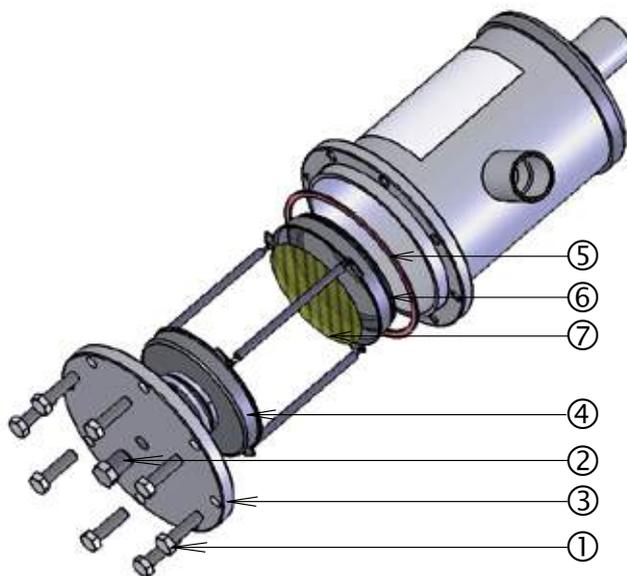


Replaceable core filter shells (suction line)

➔ **BACY** (corresponding cores: CCY 100)

■ Spare parts

CARLY references	Part N°	Description	Quantity
CY 19900520	1	Set of 10 fastening screws for end plate	1
CY 19900520	1	Set of 10 fastening stainless steel screws for end plate	1
CY 10810010	2	1/4" NPT phosphate plug for end plate	1
CY 33301700	2 + 3 + 5	End plate with gasket and 1/4" NPT plug	1
CY 37003030	4	Core holder (2, 3 and 4 cores)	1
CY 37003040	4	Core holder (3 and 4 cores)	1
CY 37003055	4	Core holder (1 core)	1
CY 37003065	4	Core holder (2 and 3 cores)	1
CY 37003085	4	Core holder (4 cores)	1
CY 15555701	5	End plate gasket	1
CY 15555620	6	Adhesive gasket for core holders: CY 37003030 - CY 37003040	1
CCY A 100	7	Adapter for end core holder	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BACY 10021 S & MMS	13,30	12,70	1
BACY 10025 S & MMS	13,40	12,80	1
BACY 10029 S & MMS	13,50	12,90	1
BACY 10033 S & MMS	14,40	13,80	1
BACY 20025 S	16,40	15,70	1
BACY 20029 S & MMS	16,60	15,90	1
BACY 20033 S & MMS	16,90	16,20	1
BACY 40033 S & MMS	23,80	22,90	1

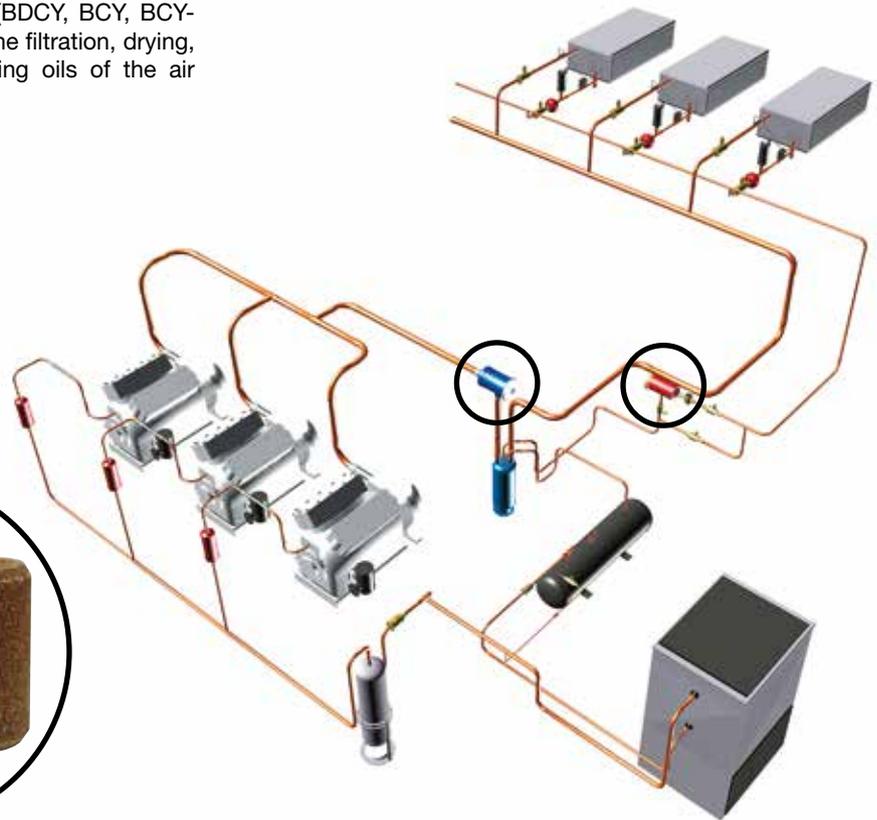
Drying, filtering and cleaning cores

CTCY-EN – 8.1-3 / 05-2014

→ CCY / PLATINIUM 48

■ Applications

- Interchangeable elements for the filter shells (BDCY, BCY, BCY-HP, BBCY, ACY, BACY and HCYBF) ensuring the filtration, drying, or cleaning of the refrigerants and refrigerating oils of the air conditioning and refrigeration installations.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- The cartridges CCY HP, PLATINIUM 48 and N:
 - can be used with all the filter shells that can be found on the market.
 - are supplied with a complete set of flange gaskets corresponding to most of the filter shells that can be found on the market.
 - are designed and manufactured to trap with a low pressure drop the humidity and impurities conveyed by the refrigerant and resist against vibrations and the circuit's pressure cyclings.
- The cleaning and drying cores CCY HP and N have a high acid adsorption power.
- The filtering cartridge CCY 48 HU can be used for all types of refrigerating oils with or without additives.

■ CARLY advantages

- The cores CCY HP, PLATINIUM 48 and N are oven-dried in order to be perfectly dehydrated before being packed in an easy-to-open sealed box. These cores have high humidity adsorption capacities at high and low condensation temperatures.
- The CCY I and F cores are efficient whichever the refrigerant flow direction.
- Efficient solutions for refrigerating circuit decontamination thanks to a complete range of cores.
- Presence of a date sticker to be filled in after the maintenance operations (core change).



Drying, filtering and cleaning cores

→ CCY / PLATINIUM 48

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Specific recommendations for drying, filtering and cleaning cores CCY HP, N, F, I, HU and PLATINIUM 48

- Refer to assembly precautions for replaceable core filter drier shells and recommendations for liquid line: BDCY, BCY, BCY-HP, BBCY, for suction replaceable core filter shells: BDCY, ACY, BACY, and for HCYBF replaceable core oil filter shells.
- Remove cores from their sealed can at the very last moment before putting them in the shells.
- The cartridges CCY 48 HP, 48 N and PLATINIUM 48 must be positioned in various cartridge holders with their funnel shape at the larger end (see chapter “ technical features of cores “ , Ø 4 on drawing N°2) on the box outlet union side.
- It is imperative to use CCY A adapters with chemical cores (CCY N, CCY HP and PLATINIUM 48) in the suction filter shells. Do not forget to remove them before installing CCY F and CCY I cores.
- Important : The CCY cores must be changed very regularly and particularly the CCY HP and PLATINIUM 48 cartridges must be absolutely replaced :
 - after each intervention on the installation requiring the opening of the circuit
 - when the liquid indicator (VCYL or VCYLS) indicates an abnormal humidity content
 - when the pressure loss measured in the filter drier shell is too great
- at least once a year as a measure of precaution.
- It is important to regularly monitor the refrigerant's moisture content and condition using sight glasses with CARLY VCYL or VCYLS moisture indicator (refer to chapter 9 or 10).
- For use of various CCY core types in the pollution control and circuit cleaning process after compressor burnout, closely follow the recommendations given to chapter 7.



Drying, filtering and cleaning cores

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→ CCY / PLATINIUM 48

■ Functional features

CARLY References	To be used with						Use			Filtration microns	Composition	Features	
	BDCY	BCY-HP	BBCY	ACY	BACY	HCYBF	On suction line	On liquid line	On oil line				
Felt cores													
CCY 42 F	X						Temporary a few days				10	Felt	For CFC, HCFC, HFC, CO ₂ Reinforced filtration
CCY 48 F				X									
CCY 100 F					X								
Stainless steel cores													
CCY 42 I	X						Permanent				140	Stainless steel mesh cloth and screen	For CFC, HCFC, HFC, CO ₂ Filtering
CCY 48 I				X									
CCY 100 I					X								
High efficiency drying cores													
CCY 42 HP	X						Temporary a few days	Permanent until saturation			50	Chemical agents	For CFC, HCFC, HFC, CO ₂ Reinforced drying acid neutralization
CCY 48 HP		X		X									
CCY 100 HP			X		X								
Very high efficiency drying cores													
PLATINIUM 48		X		X			Temporary a few days	Permanent until saturation			50	Chemical agents	For CFC, HCFC, HFC, CO ₂ Optimum drying
Cleaning cores													
CCY 42 N	X						Temporary a few days	Temporary a few days			50	Chemical agents	For CFC, HCFC, HFC, CO ₂ Burnout decontamination, reinforced drying, reinforced acid neutralization, wax and resin binding
CCY 48 N		X		X									
CCY 100 N			X		X								
Oil cores													
CCY 48 HU						X			Permanent until saturation		30	Filtrating cellulose, glued, pleated	For refrigerating oil filtering



Drying, filtering and cleaning cores

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→ CCY HP / PLATINIUM 48 / CCY N

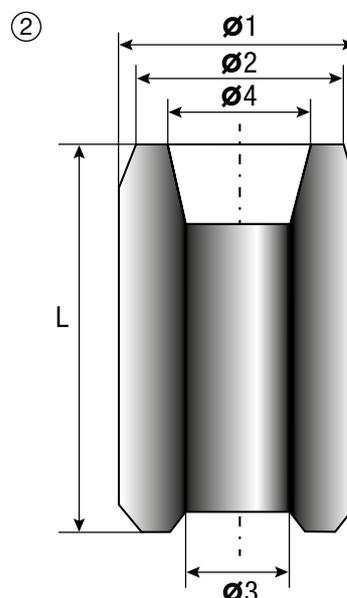
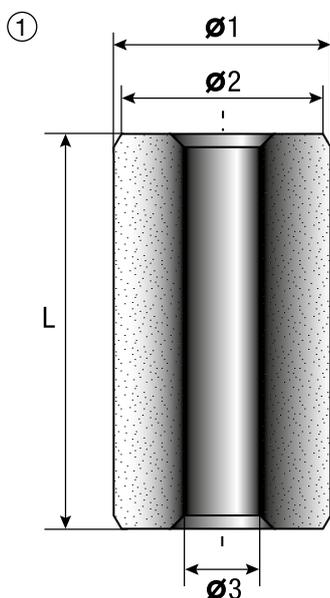
■ Selection table of drying and cleaning cores

CARLY References	Filtering surface cm ²	Volume of desiccation products cm ³	Dehydratable refrigerant capacity kg of refrigerant ⁽¹⁾						
			R22 R407C R407F		R134a R410A		R404A R507		R744 CO ₂
			24 °C	52 °C	24 °C	52 °C	24 °C	52 °C	24 °C
CCY 42 HP	374	645	47	40	53	43	50	41	29
CCY 48 HP	420	704	55	48	64	51	60	49	34
CCY 100 HP	630	1495	110	95	126	101	120	97	67
PLATINIUM 48	420	704	72	62	83	66	78	64	44
CCY 42 N	374	645	47	40	53	43	50	41	29
CCY 48 N	420	704	55	48	64	51	60	49	34
CCY 100 N	630	1495	110	95	126	101	120	97	67

⁽¹⁾ Dehydratable refrigerant capacities according to Standard ARI 710-86.

■ Technical features of drying and cleaning cores

CARLY References	Drawing Nb	Dimensions mm				
		Ø1	Ø2	Ø3	Ø4	L
CCY 42 HP	1	80	74	29	/	148
CCY 48 HP	2	94	82	45	60	139
CCY 100 HP	1	121	108	53	/	164
PLATINIUM 48	2	94	82	45	60	139
CCY 42 N	1	80	74	29	/	148
CCY 48 N	2	94	82	45	60	139
CCY 100 N	1	121	108	53	/	164





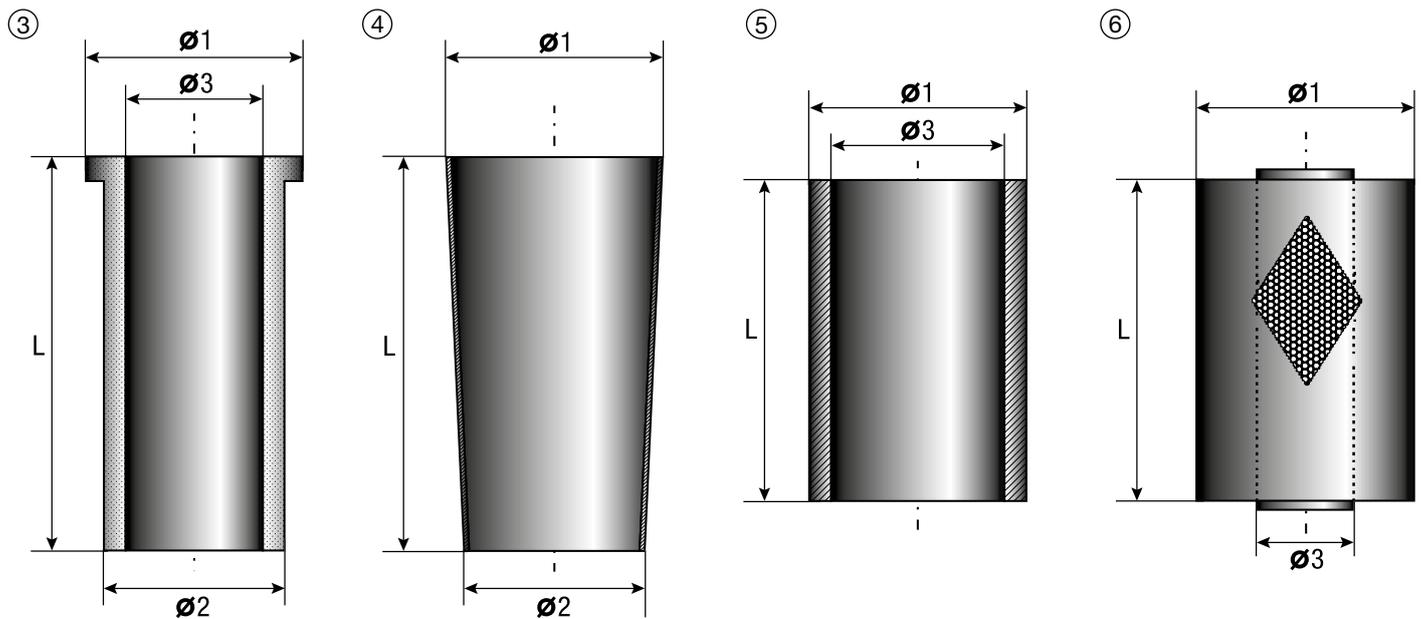
Drying, filtering and cleaning cores

CTCY-EN – 8.1-3 / 05-2014

→ CCY F / CCY I / CCY HU

■ Selection table and technical features of filtering cores

CARLY References	Drawing Nb	Surface de filtration cm ²	Dimensions mm			
			Ø1	Ø2	Ø3	L
CCY 42 F	3	329	81	62	42	155
CCY 48 F	5	420	93	/	75	140
CCY 100 F	5	630	122	/	105	166
CCY 42 I	4	348	81	62	/	155
CCY 48 I	5	420	93	/	/	140
CCY 100 I	5	630	122	/	/	166
CCY 48 HU	6	5790	101	/	27	150



■ Spare parts

CARLY References	Description	Types	Quantity
CY 1555211	End plate gasket	BDCY	1
CY 1555601	End plate gasket	ACY - BCY	1
CY 1555701	End plate gasket	BACY - BBCY	1



Drying, filtering and cleaning cores

→ CCY / PLATINIUM

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CCY 42 HP	0,77	0,68	15
CCY 48 HP	0,90	0,79	15
CCY 100 HP	1,75	1,52	6
PLATINIUM 48	0,90	0,79	15
CCY 42 N	0,62	0,53	15
CCY 48 N	0,81	0,70	15
CCY 100 N	1,58	1,36	6

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CCY 42 F	0,13	0,12	6
CCY 48 F	0,26	0,15	15
CCY 100 F	0,24	0,19	6
CCY 42 I	0,11	0,10	6
CCY 48 I	0,21	0,10	15
CCY 100 I	0,24	0,16	6
CCY 48 HU	0,31	0,30	15

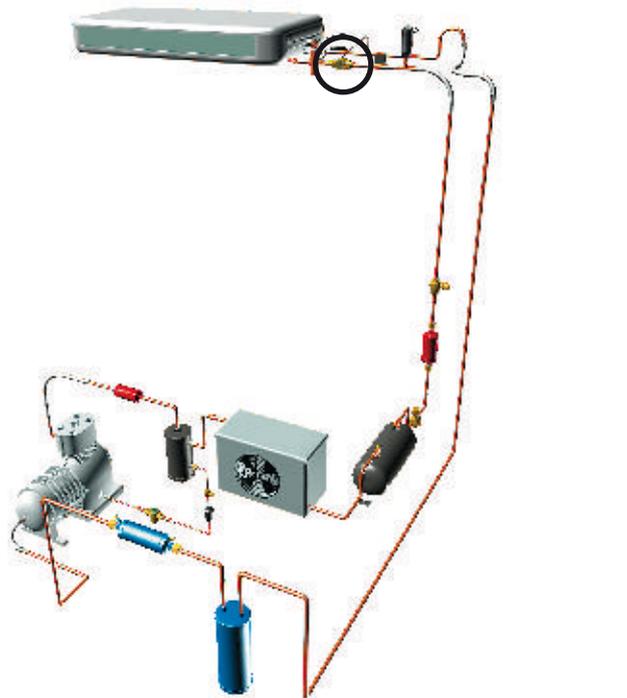
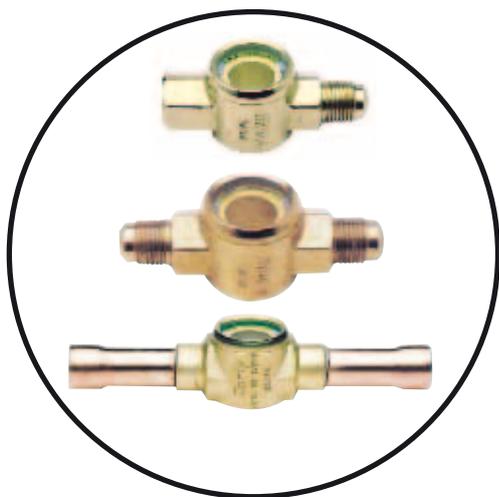


Liquid sight glasses

→ VCYL

■ Applications

- Immediate and direct monitoring of flow, condition or moisture content of the refrigerant in its liquid or diphasic phase in refrigerating and air conditioning installations.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- Monitoring with a large sight glass of the refrigerant state in the liquid pipes of the installation. The possible presence of bubbles in the refrigerant will be visible by the VCYL and it might have several meanings such as a lack of refrigerant, a too low or absent subcooling, or also a too important pressure drop due to the filter drier, which would have then to be changed.
- A reliable hygroscopic indicator responsive to humidity and resistant to acids is positioned under the glass.
- Moisture presence is characterized by a modification of the indicator colour (green when the refrigerant is dry, and yellow when it is too wet); this continuous indication is reliable and this color change is reversible. It is very important to check the level of moisture in the refrigerant, in order to avoid the formation of acids harmful to the proper functioning of the installation.
- The sight glasses die-cast brass body guarantees perfect resistance to corrosion.
- The brazed liquid sight glasses' long copper sleeves allow quick and safe brazing of connections; since the body and the glass are attached, brazing can be performed without removing the glass.
- Several types of connections are possible on standard products:
 - To be screwed type SAE, male/male and male/female
 - To be brazed for tubes in inches (S), female/female and male/female
 - To be brazed for tubes in millimeters (MMS), female/female and male/female



Possible customization on demand:

- CARLY can supply, upon request, some liquid sight glasses to solder on tubes, of type VCYLS, without hygroscopic paper or with a ball for level monitoring.

■ CARLY advantages

- Maximal working pressure: 42 bar.
- The large size of the glass and the absence of a central hygroscopic tip ensure excellent visibility.
- The moisture indicator fastening system ensures protection against erosion and prevents fouling by oils and dirt present in the circuit; it also eliminates any turbulence that would hinder proper vision of the refrigerant and does not lead to any pressure drop.
- The sealed design and the seaming principle of the chosen glass ensure perfect air-tightness.
- Two very thick hexagon head bolts facilitate sight glasses positioning and handling for tightening of connections to screw.
- The male/female sight glasses to screw are delivered with a guided copper gasket on the female side (except for the VCYL 25 which has a non-guided gasket), which enables a quick and reliable positioning.
- The male/female sight glasses to screw can be screwed directly at the outlet of the filter drier.
- The low weight of the VCYL sight glasses requires no specific binding.
- GOST certified products.



Liquid sight glasses

→ VCYL

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;
- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.
- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in

chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to liquid sight glasses VCYL

- Assembly is performed on the liquid line between the filter drier and the pressure relief valve.
- For liquid sight glasses with female connections to screw, pay attention to the correct positioning of the supplied copper seal.
- The tightening of sight glasses with screw connections must be performed with two open end spanners, in order to avoid the pipe torsion or damages to the brass body of the sight glass (tightening with pliers prohibited).
- The VCYL sight glasses have a seal underneath the glass which ensures their air tightness. This seal being very sensitive to heat, it is strongly recommended, for the sight glasses with connections to solder, not to damage it when brazing the copper connections, as significant leakage can appear. It is therefore imperative not to direct the flame of the torch in the direction of the glass and the seal, and to cool the sight glass body with a humid cloth or with **CARLYCOOL** calories discharger (refer to chapter 95).
- The indication of moisture presence is quick; on the other hand, the moisture indicator indicates the return to normal situation only a few hours after implementation of a drying system (**DCY** filter drier, **DDCY** bi-directional flow and anti-acid filter driers, **RCY** filter drier-receiver or **CCY HP/N** or **PLATINIUM 48** drying cores).

READING OF THE MOISTURE INDICATOR

Reminder of acceptable moisture rates expressed in ppm (part per million of water in the refrigerant): DIN 8949

R22 : → 60 ppm

R404A : → 50 ppm

R407C : → 50 ppm

R744 : → 10 ppm

R134a : → 50 ppm

R507 : → 50 ppm

R410A : → 50 ppm

• Colour: **Green**

Normal conditions, perfectly dried circuit; the filter driers or the drying cores, in the case of replaceable core filter drier shells, are active.

• Colour: **Light green**

The filter driers or the drying cores, in the case of replaceable core filter drier shells, are saturating. It is necessary to quickly replace them.

• Colour: **Yellow**

The filter driers or drying cores, in the case of replaceable core filter drier shells, are entirely saturated. There is a possibility of danger, the circuit is humid and polluted; immediate intervention is required: quickly install a new drying system such as **DCY** filter drier, **DDCY** bi-directional flow and anti-acid filter driers, **RCY** filter drier-receiver or **CCY HP/N** or **PLATINIUM 48** drying cores.



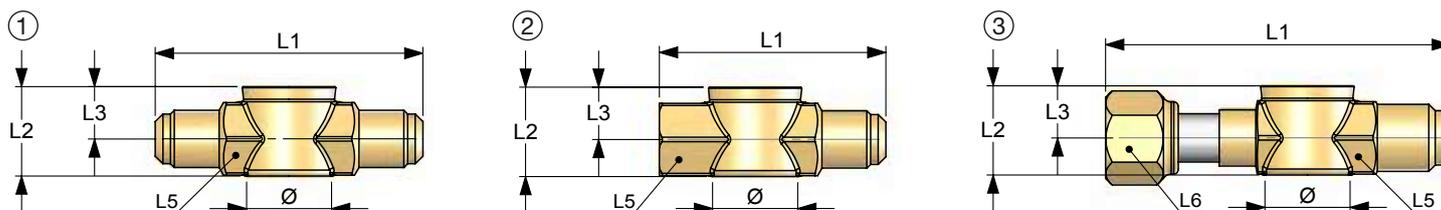
Liquid sight glasses

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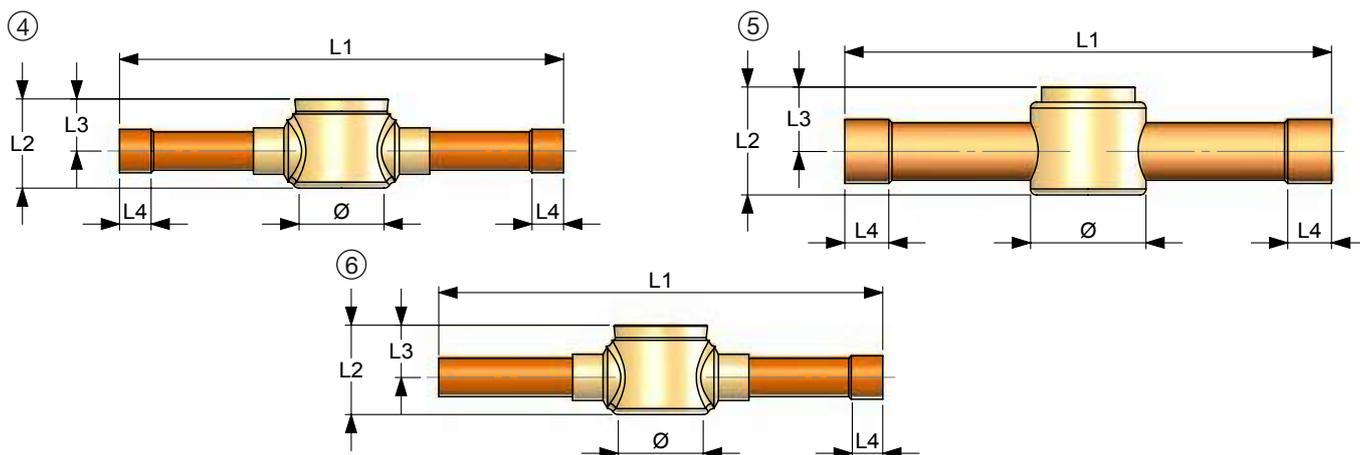
→ VCYL

■ Technical features

CARLY references	Connections to screw SAE pouce	Connections		Drawing Nb	Dimensions mm					
		Male / Male	Female / Male		∅	L1	L2	L3	L5 upper faces	L6 upper faces
VCYL 12	1/4	X		1	26	67	27	16	16	/
VCYL 13	3/8	X		1	32	82	30	17	24	/
VCYL 14	1/2	X		1	32	88	30	17	24	/
VCYL 15	5/8	X		1	32	94	30	17	24	/
VCYL 22	1/4		X	2	26	59	27	16	16	/
VCYL 23	3/8		X	2	32	69	30	17	24	/
VCYL 24	1/2		X	2	32	75	30	17	24	/
VCYL 25	5/8		X	3	32	113	30	17	24	27



CARLY references	Connections to solder ODF inch	CARLY references	Connections to solder ODF mm	Connections		Drawing Nb	Dimensions mm				
				Male / Female	Female / Female		∅	L1	L2	L3	L4
VCYL 32 S	1/4	VCYL 32 MMS	6		X	4	26	101	27	16	8
VCYL 33 S	3/8	VCYL 33 MMS	10		X	4	26	119	27	16	10
VCYL 34 S	1/2	VCYL 34 MMS	12		X	4	32	146	30	17	10
VCYL 35 S/MMS	5/8	VCYL 35 S/MMS	16		X	4	32	146	30	17	12
VCYL 36 S	3/4	VCYL 36 MMS	18		X	5	38	160	36	21	14
VCYL 37 S/MMS	7/8	VCYL 37 S/MMS	22		X	5	38	160	36	21	17
VCYL 39 S	1 1/8	VCYL 39 MMS	28		X	5	43	160	42	25	23
VCYL 52 S	1/4	VCYL 52 MMS	6	X		6	26	101	27	16	8
VCYL 53 S	3/8	VCYL 53 MMS	10	X		6	26	119	27	16	10
VCYL 54 S	1/2	VCYL 54 MMS	12	X		6	32	146	30	17	10
VCYL 55 S/MMS	5/8	VCYL 55 S/MMS	16	X		6	32	146	30	17	12





Liquid sight glasses

→ VCYL

■ Technical features

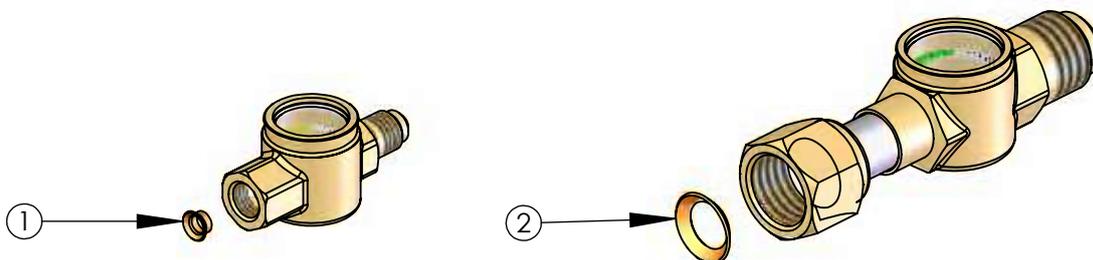
CARLY references	Nominal diameter	CARLY references	Nominal diameter	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	DN inch		DN mm						
VCYL 12	1/4			42	/	100	-20	/	Art3§3
VCYL 13	3/8			42	/	100	-20	/	Art3§3
VCYL 14	1/2			42	/	100	-20	/	Art3§3
VCYL 15	5/8			42	/	100	-20	/	Art3§3
VCYL 22	1/2			42	/	100	-20	/	Art3§3
VCYL 23	3/8			42	/	100	-20	/	Art3§3
VCYL 24	1/4			42	/	100	-20	/	Art3§3
VCYL 25	5/8			42	/	100	-20	/	Art3§3
VCYL 32 S	1/4	VCYL 32 MMS	6	42	/	100	-20	/	Art3§3
VCYL 33 S	3/8	VCYL 33 MMS	10	42	/	100	-20	/	Art3§3
VCYL 34 S	1/2	VCYL 34 MMS	12	42	/	100	-20	/	Art3§3
VCYL 35 S/MMS	5/8	VCYL 35 S/MMS	16	42	/	100	-20	/	Art3§3
VCYL 36 S	3/4	VCYL 36 MMS	18	42	/	100	-20	/	Art3§3
VCYL 37 S/MMS	7/8	VCYL 37 S/MMS	22	42	/	100	-20	/	Art3§3
VCYL 39 S	1 1/8	VCYL 39 MMS	28	42	/	100	-20	/	Art3§3
VCYL 52 S	1/4	VCYL 52 MMS	6	42	/	100	-20	/	Art3§3
VCYL 53 S	3/8	VCYL 53 MMS	10	42	/	100	-20	/	Art3§3
VCYL 54 S	1/2	VCYL 54 MMS	12	42	/	100	-20	/	Art3§3
VCYL 55 S/MMS	5/8	VCYL 55 S/MMS	19	42	/	100	-20	/	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

■ Spare parts

CARLY references	Part N°	Description	Types	Quantity
CY 15590015	1	Set of 25 guided taper copper gaskets for 1/4" SAE (flare) connections	VCYL 22	1
CY 15590025	1	Set of 25 guided taper copper gaskets for 3/8" SAE (flare) connections	VCYL 23	1
CY 15590035	1	Set of 25 guided taper copper gaskets for 1/2" SAE (flare) connections	VCYL 24	1
CY 15590040	2	Set of 25 taper copper gaskets for 5/8" SAE (flare) connections	VCYL 25	1





Liquid sight glasses

→ VCYL

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
VCYL 12	0,11	0,10	1
VCYL 13	0,21	0,20	1
VCYL 14	0,26	0,25	1
VCYL 15	0,31	0,30	1
VCYL 22	0,16	0,15	8
VCYL 23	0,21	0,20	8
VCYL 24	0,26	0,25	1
VCYL 25	0,29	0,28	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
VCYL 32 S & MMS	0,12	0,10	1
VCYL 33 S & MMS	0,12	0,10	1
VCYL 34 S & MMS	0,17	0,15	1
VCYL 35 S/MMS	0,22	0,20	1
VCYL 36 S & MMS	0,25	0,22	1
VCYL 37 S/MMS	0,28	0,25	1
VCYL 39 S & MMS	0,28	0,25	1
VCYL 52 S & MMS	0,12	0,10	1
VCYL 53 S & MMS	0,12	0,10	1
VCYL 54 S & MMS	0,17	0,15	1
VCYL 55 S/MMS	0,22	0,20	1



Liquid sight glasses

→ VCYLS

■ Applications

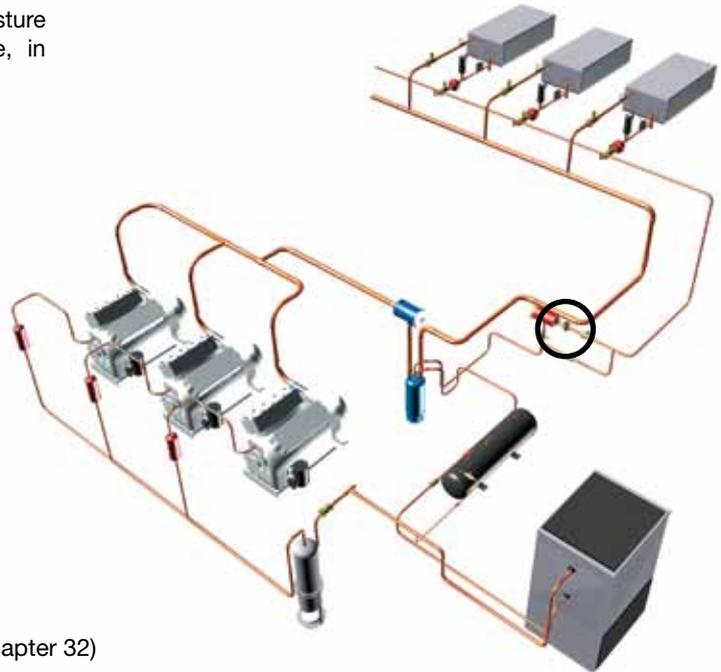
- Immediate and direct monitoring of flow, condition and moisture content of the refrigerant in its liquid or diphasic phase, in refrigerating and air conditioning installations.



Standard product



Sight glass with steel base (see chapter 32)



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- Monitoring with a large sight glass of the refrigerant state in the liquid pipes of the installation. The possible presence of bubbles in the refrigerant will be visible by the VCYLS and it might have several meanings such as a lack of refrigerant, a too low or absent subcooling, or also a too important pressure drop due to the filter drier, which would have then to be changed.
- A reliable hygroscopic indicator responsive to humidity and resistant to acids is positioned under the glass.
- Moisture presence is characterized by a modification of the indicator colour (green when the refrigerant is dry, and yellow when it is too wet); this continuous indication is reliable and this color change is reversible. It is very important to check the level of moisture in the refrigerant, in order to avoid the formation of acids harmful to the proper functioning of the installation.
- Constitution of the three-part sight glass:
 - one brass base to be brazed directly on piping after drilling.
 - one glass with one moisture indicator, screwed on the base.
 - one PTFE O-ring gasket ensuring air-tightness between the base and the glass.



Possible customization on demand:

- CARLY can supply, upon request, some liquid sight glasses to solder on tubes, of type VCYLS, without hygroscopic paper or with a ball for level monitoring.

■ CARLY advantages

- Maximal working pressure: 42 bar.
- The large size of the glass and the absence of a central hygroscopic tip ensure an excellent visibility.
- The moisture indicator fastening system ensures protection against erosion and prevents fouling by oils and dirt present in the circuit; it also eliminates any turbulence that would hinder proper vision of the refrigerant and does not lead to any pressure drop.
- Room, material and mounting time are saved, compared with the installation of a sight glass fitted to bypass the refrigerating line.
- The brass base and the dichromated zinc-plated steel glass ensure perfect resistance to corrosion.
- The glass is cast in metal which eliminates risks of leak.
- GOST certified product.



Liquid sight glasses

→ VCYLS

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;
- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.
- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in

chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to liquid sight glasses VCYLS

- Assembly is performed on the liquid line between the filter drier and the pressure relief valve.
- The glass and the O-ring should be removed during the brazing of the base on the piping.
- After the brazing and when the temperature of the base is low enough, put back in place the seal and tight the glass with preferably an hexagonal spanner, respecting a tightening torque of 25 N.m.
- The O-ring (CARLY reference CY 15552180) should be replaced after each removal of the glass.
- The indication of moisture presence is quick; in return, the moisture indicator indicates the return to normal situation a

few hours only after implementation of a drying system (**DCY** filter drier, **DDCY** bi-directional flow and anti-acid filter driers, **RCY** filter drier-receiver or **CCY HP/N** or **PLATINIUM 48** drying cores).

READING OF THE MOISTURE INDICATOR

Reminder of acceptable moisture rates expressed in ppm (part per million of water in the refrigerant): DIN 8949

R22 : → 60 ppm

R404A : → 50 ppm

R407C : → 50 ppm

R744 : → 10 ppm

R134a : → 50 ppm

R507 : → 50 ppm

R410A : → 50 ppm

R407F : → 50 ppm

• Colour: Green

Normal conditions, perfectly dried circuit; the filter driers or the drying cores, in the case of replaceable core filter drier shells, are active.

• Colour: Light green

The filter driers or the drying cores, in the case of replaceable core filter drier shells, are saturating. it is necessary to quickly replace them.

• Colour: Yellow

The filter driers or drying cores, in the case of replaceable core filter drier shells, are entirely saturated. There is a possibility of danger, the circuit is humid and polluted; immediate intervention is required: quickly install a new drying system such as **DCY** filter drier, **DDCY** bi-directional flow and anti-acid filter driers, **RCY** filter drier-receiver or **CCY HP/N** or **PLATINIUM 48** drying cores.

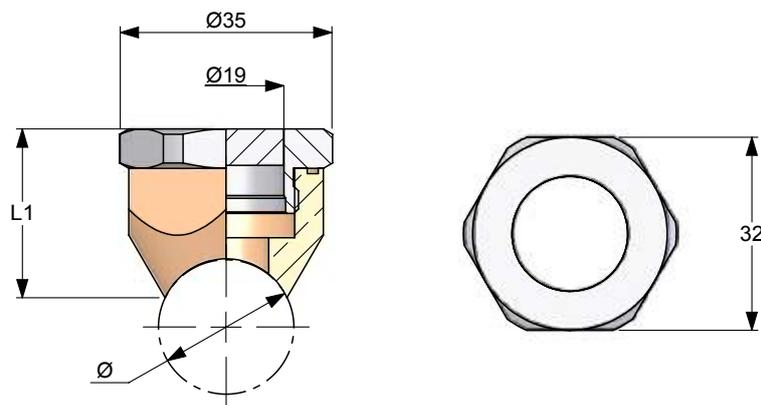


Liquid sight glasses

→ VCYLS

■ Technical features

CARLY references	For soldering onto the pipe		Dimensions
	Ø inch	Ø mm	L1 mm
VCYLS 5	5/8	16	29
VCYLS 7	7/8	22	28
VCYLS 9	1 1/8	28	27
VCYLS 11	1 3/8	35	26
VCYLS 13	1 5/8	42	25
VCYLS 17	2 1/8	54	24
VCYLS 21	2 5/8	67	24



CARLY references	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
VCYLS 5	42	/	100	-20	/	Art3§3
VCYLS 7	42	/	100	-20	/	Art3§3
VCYLS 9	42	/	100	-20	/	Art3§3
VCYLS 11	42	/	100	-20	/	Art3§3
VCYLS 13	42	/	100	-20	/	Art3§3
VCYLS 17	42	/	100	-20	/	Art3§3
VCYLS 21	42	/	100	-20	/	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

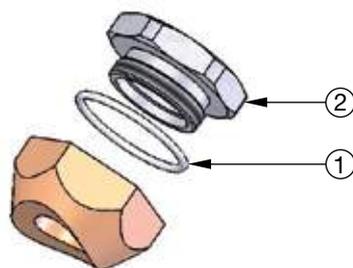


Liquid sight glasses

→ VCYLS

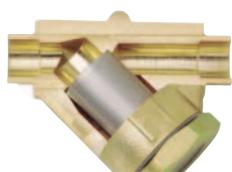
■ Spare parts

CARLY references	Part N°	Description	Quantity
CY 15552180	1	O-ring PTFE gasket for sight glass	1
CY 35012140	2	Glass with moisture indicator, gasket included	1
CY 35012150	2	Glass without moisture indicator, gasket included	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
VCYLS 5	0,11	0,10	10
VCYLS 7	0,11	0,10	10
VCYLS 9	0,11	0,10	10
VCYLS 11	0,11	0,10	10
VCYLS 13	0,11	0,10	10
VCYLS 17	0,11	0,10	10
VCYLS 21	0,11	0,10	10

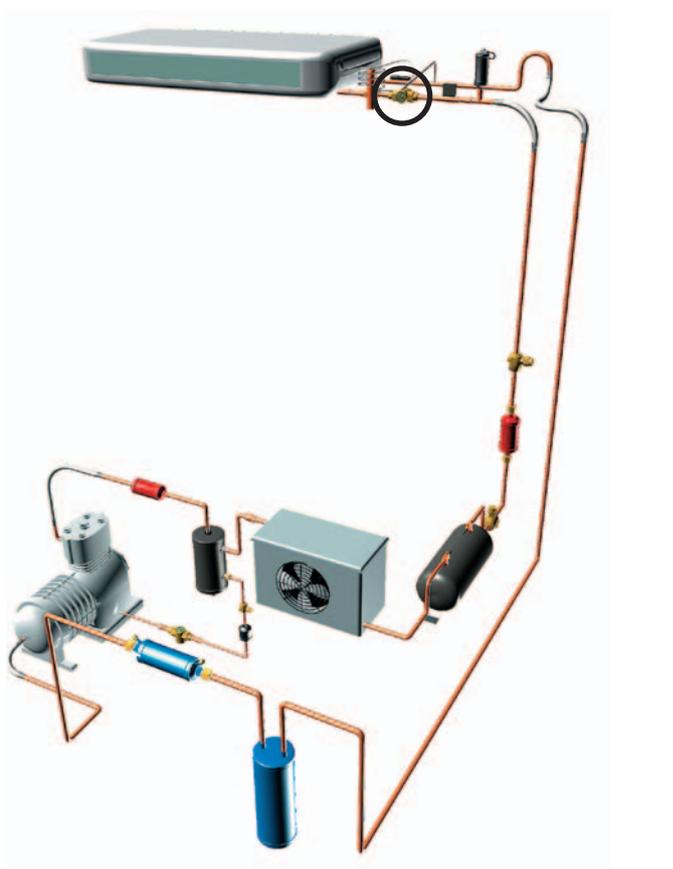
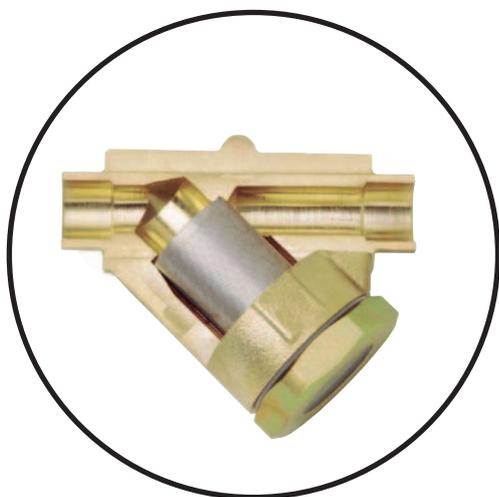


Dirt filters

→ FILTRY (permanent use)

■ Applications

- Permanent refrigerant filtering, regulation and expansion element protection in refrigerating and air conditioning installations.
- These filters are particularly suited for commercial refrigerating applications and installations with important liquid line lengths

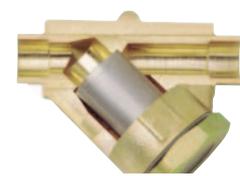


■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- Product is ergonomic for quick maintenance interventions.
- Body made of die-cast brass with brazed connection.
- Filtration preventing propagation within the circuit of particles bigger than 150 microns in standard version, with a filtration area of 16 cm².

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Supply of a 50-micron filtrating sleeve on request.
- The stainless steel filtrating sleeve can be removed for cleaning, without removing the filter case and without de-brazing the connections, thus allowing important time savings during maintenance operations.
- Plug can be handled with a flat spanner.
- Fastening plug in brass, can be handled with a spanner.
- Compact product for ease of assembly in reduced footprint.
- It is possible to replace the original tap of FILTRY by a sight glass with moisture indicator, CARLY reference CY 35012140.
- GOST certified products.



Dirt filters

→ FILTRY (permanent use)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

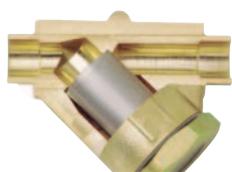
The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;
- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.
- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in

chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to dirt filters FILTRY

- FILTRY dirt filters are to be mounted on the liquid line between the receiver and the expansion element.
- The refrigerant flow direction is indicated by an arrow on filter case. It must be complied with.
- The FILTRY dirt filters have to be mounted horizontally, the part with the strainer oriented downwards.
- It is mandatory to remove the filtrating sleeve and the O-ring before assembling filter by brazing.
- After brazing, when the base temperature is sufficiently low, put the O-ring back into its recess and screw back the plug complying with a six-side key with the recommended tightening torque of 15 N.m.
- After each removal of the plug, imperatively replace the PTFE O-ring; it is preferable to position, in a first step, the filtrating sleeve in the filter case and in a second step, to screw the plug.
- Be careful to properly select the solenoid valves located downstream of the filters; their oversizing could cause liquid hammer phenomena hindering the filters' proper mechanical behaviour; these liquid hammer phenomena can originate from other sources, in long-piping installations.
- Never install filters in an area of the circuit that can be isolated.
- Never trap refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- It is mandatory to change or to clean the filtrating sleeves with a solvent when the pressure drop measured in the FILTRY filter is too important. CARLY recommends this operation at least once a year as prevention.

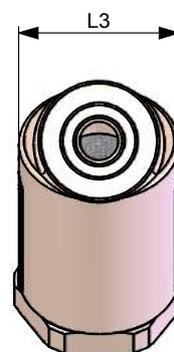
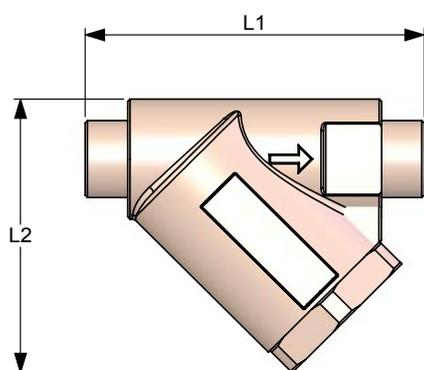


Dirt filters

→ FILTRY (permanent use)

■ Technical features

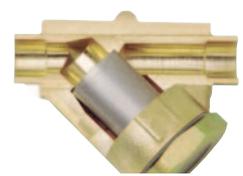
CARLY references	Connections to solder ODF inch	CARLY references	Connections to solder ODF mm	Filtering surface cm ²	Filtering μm	Dimensions mm		
						L1	L2	L3
FILTRY 3 S	3/8	FILTRY 3 MMS	10	16	150	70	58	33
FILTRY 4 S	1/2	FILTRY 4 MMS	12	16	150	70	58	33
FILTRY 5 S	5/8	FILTRY 5 MMS	15	16	150	70	58	33



CARLY references		Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
		PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
FILTRY 3 S	FILTRY 3 MMS	46	15	100	-40	-30	Art3§3
FILTRY 4 S	FILTRY 4 MMS	46	15	100	-40	-30	Art3§3
FILTRY 5 S	FILTRY 5 MMS	46	15	100	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

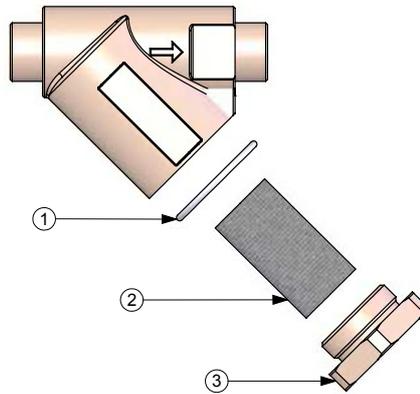


Dirt filters

→ FILTRY (permanent use)

■ Spare parts

CARLY references	Part N°	Description	Quantity
CY 15552180	1	O-ring PTFE gasket	1
CY 11610050	2	50 microns filtrating sleeve	1
CY 11610150	2	150 microns filtrating sleeve	1
CY 10850110	3	Standard fastening plug	1
CY 35012150	3	Glass without moisture indicator	1
CY 35012140	3	Glass with moisture indicator	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FILTRY 3 S & MMS	0,31	0,30	16
FILTRY 4 S & MMS	0,31	0,30	16
FILTRY 5 S & MMS	0,31	0,30	16

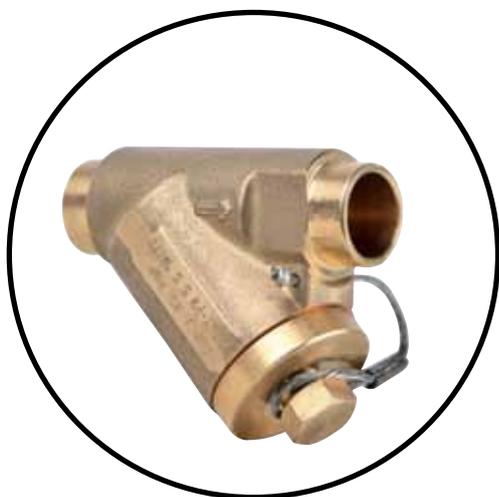


Dirt filters

→ **FILTRY-P9 / 90 bar (1305 psig)** *(permanent use)*

■ Applications

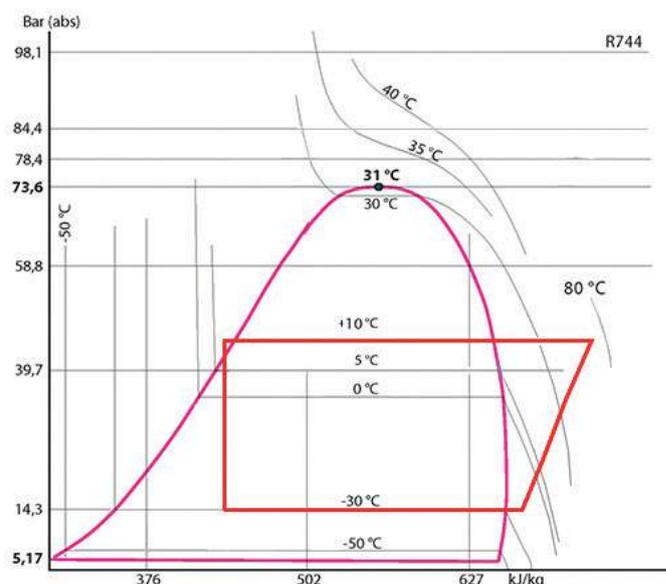
- Permanent refrigerant filtering, regulation and expansion element protection in refrigerating and air conditioning installations.
- These filters are particularly suited for commercial refrigerating applications and installations with important liquid line lengths.



90 bar



SUBCRITICAL AND TRANSCRITICAL



■ Functional features

- Products are compatible with HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- Product is ergonomic for quick maintenance interventions.
- Body made of die-cast brass with brazed connection.
- Filtration preventing propagation within the circuit of particles bigger than 50 microns with a filtration area of 16 cm².

■ CARLY advantages

- Maximal working pressure: up to 90 bar with CO₂ in subcritical and transcritical compression systems.
- The stainless steel filtering sleeve can be removed for cleaning, without removing the filter case and without debrazing the connections, thus allowing important time savings during maintenance operations.
- Plug can be handled with a flat spanner and fitted with a safety metallic cable.
- Fastening plug in brass, can be handled with a spanner.
- Compact product for ease of assembly in reduced footprint.



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Dirt filters

→ FILTRY-P9 / 90 bar (1305 psig) *(permanent use)*

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;
- Other are general to all CARLY

components, they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to dirt filters FILTRY-P9

- FILTRY-P9 dirt filters are to be mounted on the liquid line between the receiver and the expansion element.
- The refrigerant flow direction is indicated by an arrow on filter case. It must be complied with.
- The FILTRY-P9 dirt filters have to be mounted horizontally, the part with the strainer oriented downwards.
- It is mandatory to remove the filtrating sleeve and the O-ring before assembling filter by brazing.
- After brazing, when the base temperature is sufficiently low, put the O-ring back into its recess and screw back the plug complying with a six-side key with the recommended tightening torque of 15 N.m.
- After each removal of the plug, imperatively replace the PTFE O-ring; it is preferable to position, in a first step, the filtrating sleeve in the filter case and in a second step, to screw the plug.
- Be careful to properly select the solenoid valves located downstream of the filters; their oversizing could cause liquid hammer phenomena hindering the filters' proper mechanical behaviour; these liquid hammer phenomena can originate from other sources, in long-piping installations.
- Never install filters in an area of the circuit that can be isolated.
- Never trap refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- It is mandatory to change or to clean the filtrating sleeves with a solvent when the pressure drop measured in the FILTRY-P9 filter is too important. CARLY recommends this operation at least once a year as prevention.



Dirt filters

→ **FILTRY-P9 / 90 bar (1305 psig)** *(permanent use)*

■ **Special precautions for components used with CO₂ in sub. and transcritical systems**

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The hot gas defrost, frequently used with CO₂ for low temperatures applications, generates also high pressures (to take in consideration)
- The implementation on the liquid line of a filter drier **DCY-P14**, or a filter drier shell **BCY-P14** equipped with drying cores **CCY 48 HP** or **PLATINIUM 48**, is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice and even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly dirt filters FILTRY-P9 do not have polymer gaskets.



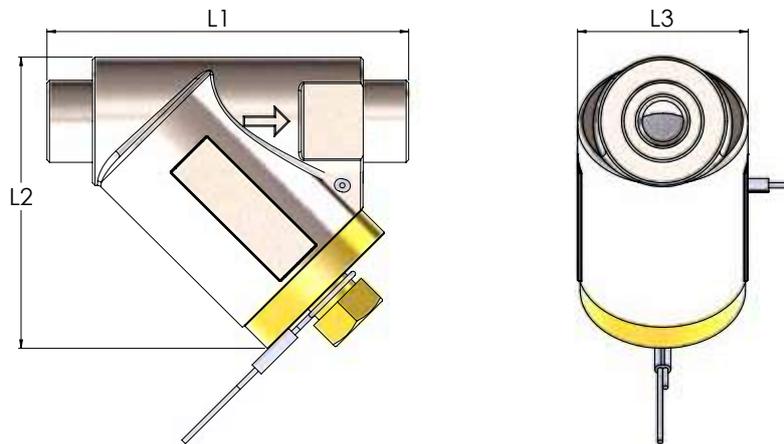
CTCY-EN – 11.5-1 / 07-2015

Dirt filters

→ FILTRY-P9 / 90 bar (1305 psig) (permanent use)

■ Technical features

CARLY references	Connections to solder ODF inch	CARLY references	Connections to solder ODF mm	Filtering surface cm ²	Filtering μm	Dimensions mm		
						L1	L2	L3
FILTRY-P9 2 S	1/4	FILTRY-P9 2 MMS	6	16	50	70	58	33
FILTRY-P9 3 S	3/8	FILTRY-P9 3 MMS	10	16	50	70	58	33
FILTRY-P9 4 S	1/2	FILTRY-P9 4 MMS	12	16	50	70	58	33
FILTRY-P9 5 S/MMS	5/8	FILTRY-P9 5 S/MMS	16	16	50	70	58	33



CARLY references	Nominal diameter	CARLY references	Nominal diameter	Maximal working pressure	Working pressure (1)	Maximal working temperature	Minimal working temperature	Working temperature (1)	CE Category (2)
	DN inch		DN mm						
FILTRY-P9 2 S	1/4	FILTRY-P9 2 MMS	6	90	15	100	-40	-30	Art 3§3
FILTRY-P9 3 S	3/8	FILTRY-P9 3 MMS	10	90	15	100	-40	-30	Art 3§3
FILTRY-P9 4 S	1/2	FILTRY-P9 4 MMS	12	90	15	100	-40	-30	Art 3§3
FILTRY-P9 5 S/MMS	5/8	FILTRY-P9 5 S/MMS	16	90	15	100	-40	-30	Art 3§3

(1) The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

(2) Classification by diameter, according to PED 97/23/EC (refer to chapter 0 to CARLY technical catalogue).

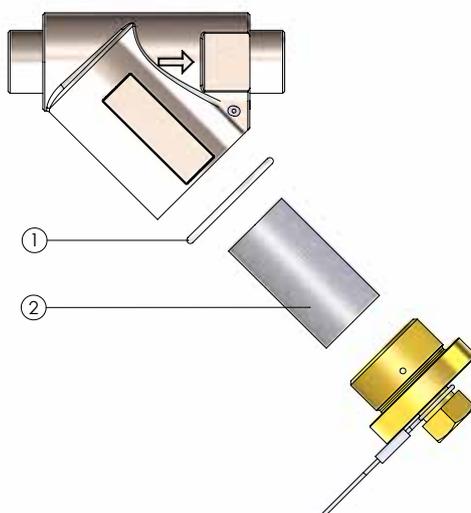


Dirt filters

→ **FILTRY-P9 / 90 bar (1305 psig)** *(permanent use)*

■ Spare parts

CARLY references	Part N°	Description	Quantity
CY 15552180	1	O-ring PTFE gasket	1
CY 11610050	2	50 microns filtrating sleeve	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FILTRY-P9 2 S	0,31	0,30	1
FILTRY-P9 3 S	0,31	0,30	1
FILTRY-P9 4 S	0,31	0,30	1
FILTRY-P9 5 S/MMS	0,31	0,30	1

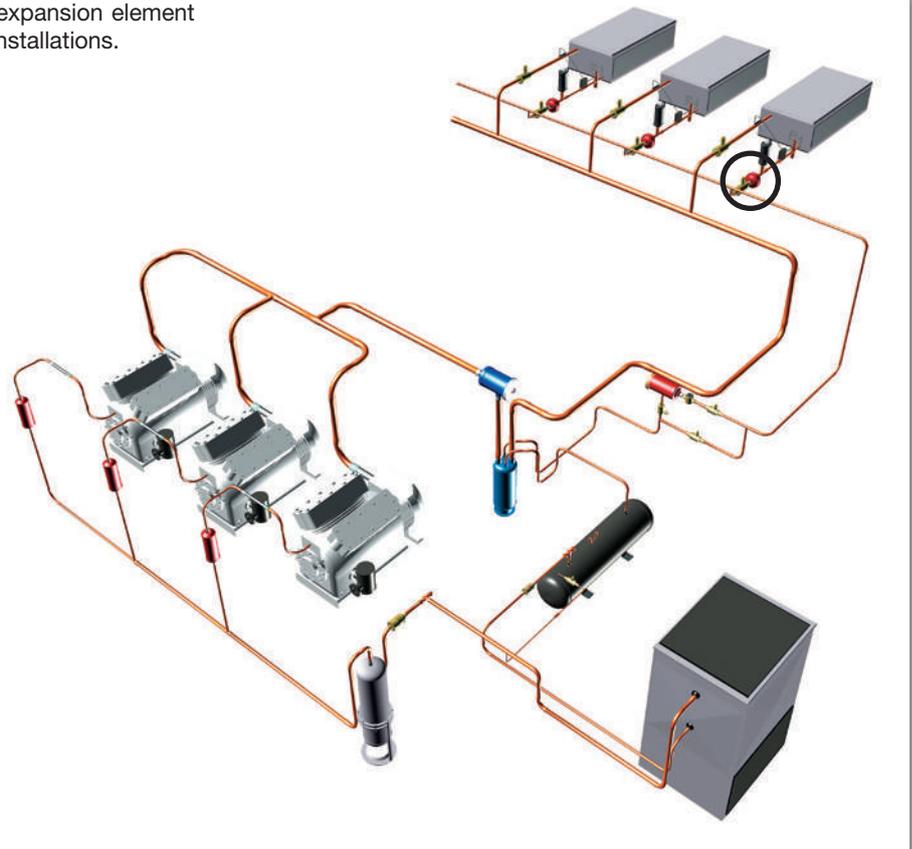


Dirt filters

→ FCY (permanent use)

■ Applications

- Permanent refrigerant filtering, regulation and expansion element protection in refrigerating and air conditioning installations.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection
- External steel body hermetically sealed with paint to ensure a high resistance to corrosion
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- Several types of connections are possible on standard products:
 - To be screwed type SAE
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimeters (MMS)



Possible customization on demand:

- Specific connections (O-RING, ORFS, ...)

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Compact products for ease of assembly in reduced footing.
- Internal retention system with minimum pressure drop, preventing the release of trapped contaminating agents.
- Very large filtering area that limits pressure drop.
- The copper-plated steel connections up to a diameter of 3/4" to be welded facilitate the brazing and allow using filler metals with a low silver percentage.
- GOST certified products.



Dirt filters

→ FCY (permanent use)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;
- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.
- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in

chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the FCY dirt filters

- FCY dirt filters are to be mounted on the liquid line between the receiver and the expansion element.
- Never use these dirt filters on the oil line; in such a case, use HCYF oil filters, or HYDROIL filter driers for POE oils (refer to chapters 45 and 47).
- The refrigerant flow direction is indicated by an “IN” mark in the inlet shell of the filter drier and by an arrow on the filter tag. It must be necessarily respected.
- We recommend the vertical mounting of the dewatering filter with a top-down fluid flow direction in order to favour its filling when in operation and a rapid flow of the fluid when the installation is shut down.
- Be careful to properly select the solenoid valves located downstream of the filters; their oversizing could cause liquid hammer phenomena hindering the filters’ proper mechanical behaviour; these liquid hammer phenomena can originate from other sources, in long-piping installations; in case of doubt, it is preferable to use FILTRY dirt filters.
- Never install the filters in an area of the circuit that can be isolated.
- Never trap refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- It is mandatory to change the dirt filters when the pressure drop measured in filter is too important. CARLY recommends this operation at least once a year as prevention.
- *Make sure that the piping can support without deformation the weight of the dirt filter ; otherwise, provide for the attachment of the dirt filter with a clamp on a stable part of the installation.*



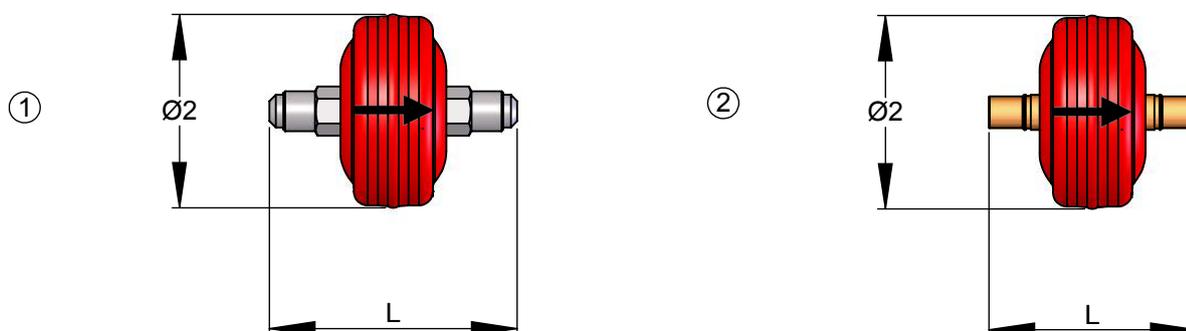
Dirt filters

→ FCY (permanent use)

■ Technical features

CARLY references	Connections ⁽¹⁾		CARLY references	Connections ⁽¹⁾		Drawing Nb	Filtering surface cm ²	Dimensions mm	
	To screw SAE inch	To solder ODF inch		To solder ODF mm	Connections types ⁽¹⁾			Ø2	L
FCY 702	1/4				1	1	40	76	92
FCY 702 S		1/4	FCY 702 MMS	6	2	2	40	76	82
FCY 703	3/8				1	1	40	76	98
FCY 703 S		3/8	FCY 703 MMS	10	2	2	40	76	82
FCY 894	1/2				1	1	65	96	108
FCY 894 S		1/2	FCY 894 MMS	12	2	2	65	96	88
FCY 895	5/8				1	1	65	96	112
FCY 895 S/MMS		5/8	FCY 895 S/MMS	16	2	2	65	96	92
FCY 896 S		3/4	FCY 896 MMS	18	2	2	65	96	98
FCY 897 S/MMS		7/8	FCY 897 S/MMS	22	2	2	65	96	112
FCY 899 S		1 1/8	FCY 899 MMS	28	3	2	65	96	122
FCY 8911 S/MMS		1 3/8	FCY 8911 S/MMS	35	3	2	65	96	142

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).



CARLY references	Volume V L	Maximal working pressure PS bar	Working pressure ⁽¹⁾ PS BT bar	Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature ⁽¹⁾ TS BT °C	CE Category ⁽²⁾	
								FCY 702
FCY 702 S	FCY 702 MMS	0,15	46	15	100	-40	-30	Art3§3
FCY 703	0,15	46	15	100	-40	-30	Art3§3	
FCY 703 S	FCY 703 MMS	0,15	46	15	100	-40	-30	Art3§3
FCY 894	0,26	46	15	100	-40	-30	Art3§3	
FCY 894 S	FCY 894 MMS	0,26	46	15	100	-40	-30	Art3§3
FCY 895	0,26	46	15	100	-40	-30	Art3§3	
FCY 895 S/MMS	0,26	46	15	100	-40	-30	Art3§3	
FCY 896 S	FCY 896 MMS	0,26	46	15	100	-40	-30	Art3§3
FCY 897 S/MMS	0,27	46	15	100	-40	-30	Art3§3	
FCY 899 S	FCY 899 MMS	0,29	46	15	100	-40	-30	Art3§3
FCY 8911 S/MMS	0,29	46	15	100	-40	-30	Art3§3	

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).



Dirt filters

→ FCY (permanent use)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FCY 702	0,39	0,35	16
FCY 702 S & MMS	0,39	0,35	16
FCY 703	0,44	0,40	16
FCY 703 S & MMS	0,44	0,40	16
FCY 894	0,57	0,50	1
FCY 894 S & MMS	0,57	0,50	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FCY 895	0,67	0,60	1
FCY 895 S/MMS	0,67	0,60	1
FCY 896 S & MMS	0,67	0,60	1
FCY 897 S/MMS	0,72	0,65	1
FCY 899 S & MMS	0,72	0,65	1
FCY 8911 S/MMS	0,92	0,85	1



Dirt filters

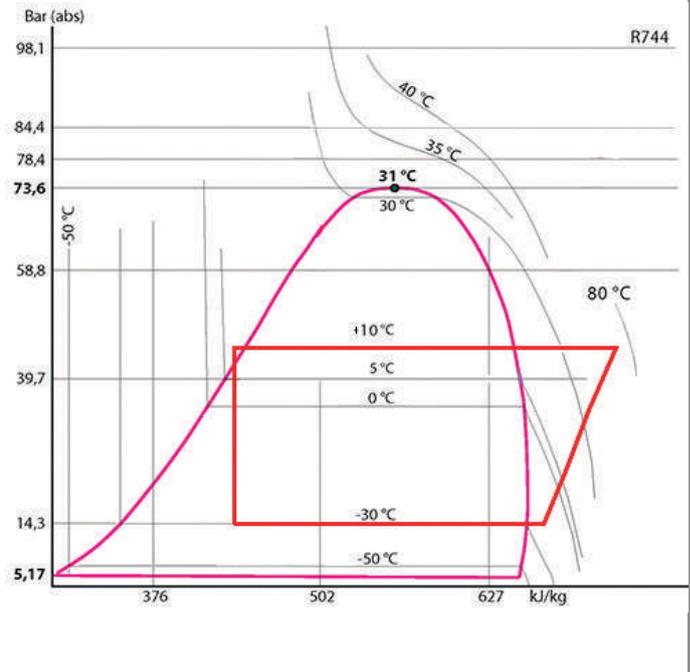
→ FCY-P6 / 64 bar (928 psig) (permanent use)

■ Applications

- Permanent refrigerant filtering, regulation and expansion element protection in refrigerating and air conditioning installations, running with high working pressures.

64 bar

CO₂ SUBCRITICAL



■ Functional features

- Products are compatible with HFC, CO₂, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection
- External steel body hermetically sealed with paint to ensure a high resistance to corrosion
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- One type of connection is on standard products: to be screwed type SAE

Possible customization on demand:

- Specific connections (O-RING, ORFS, ...)
- To be brazed for tubes in inches (S)
- To be brazed for tubes in millimeters (MMS)

■ CARLY advantages

- Maximal working pressure: up to 64 bar with CO₂ in subcritical compression systems.
- Compact products for ease of assembly in reduced footing.
- Internal retention system with minimum pressure drop, preventing the release of trapped contaminating agents.
- Very large filtering area that limits pressure drop.



Dirt filters

→ FCY-P6 / 64 bar (928 psig) *(permanent use)*

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;
- Other are general to all CARLY components, they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the FCY-P6 dirt filters

- FCY-P6 dirt filters are to be mounted on the liquid line between the receiver and the expansion element.
- Never use these dirt filters on the oil line; in such a case, use HCYF-P6 oil filters (refer to chapter 45 of CARLY technical catalogue).
- The refrigerant flow direction is indicated by an "IN" mark in the inlet shell of the filter drier and by an arrow on the filter tag. It must be necessarily respected.
- We recommend the vertical mounting of the dewatering filter with a top-down fluid flow direction in order to favour its filling when in operation and a rapid flow of the fluid when the installation is shut down.
- Be careful to properly select the solenoid valves located downstream of the filters; their oversizing could cause liquid hammer phenomena hindering the filters' proper mechanical behaviour; these liquid hammer phenomena can originate from other sources, in long-piping installations; in case of doubt, it is preferable to use FILTRY-P9 dirt filters. (refer to chapter 11 of CARLY technical catalogue).
- Never install the filters in an area of the circuit that can be isolated.
- Never trap refrigerant in its liquid state (between a check valve and a solenoid valve, for instance).
- It is mandatory to change the dirt filters when the pressure drop measured in filter is too important. CARLY recommends this operation at least once a year as prevention.
- Make sure that the piping can support without deformation the weight of the dirt filter ; otherwise, provide for the attachment of the dirt filter with a clamp on a stable part of the installation.



Dirt filters

→ **FCY-P6 / 64 bar (928 psig)** *(permanent use)*

■ Special precautions for components used with CO₂ in subcritical systems

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The hot gas defrost, frequently used with CO₂ for low temperatures applications, generates also high pressures (to take in consideration)
- The implementation on the liquid line of a filter drier **DCY-P6** is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice and even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly **dirt filters FCY-P6** do not have polymer gaskets directly in contact with CO₂.



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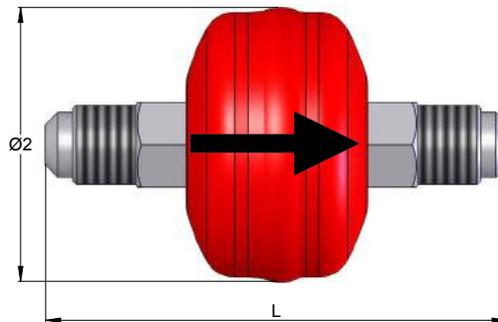
Dirt filters

→ FCY-P6 / 64 bar (928 psig) (permanent use)

■ Technical features

CARLY references	Connections ⁽¹⁾		Connections types ⁽¹⁾	Filtering surface cm ²	Dimensions mm	
	To screw SAE inch	To solder ODF inch			Ø2	L
FCY-P6 502	1/4"		1	20	55	86
FCY-P6 503	3/8"		1	20	55	92

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114 of CARLY technical catalogue).



CARLY references	Volume V L	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
		PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
FCY-P6 502	0,06	64	15	100	-40	-30	Art 3§3
FCY-P6 503	0,06	64	15	100	-40	-30	Art 3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0 of CARLY technical catalogue).

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FCY-P6 502	0,28	0,25	1
FCY-P6 503	0,28	0,25	1

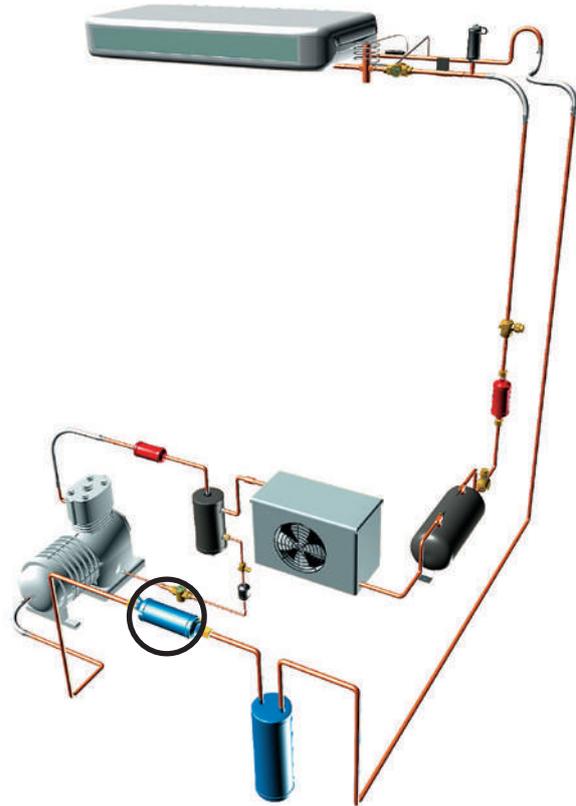


Cleaning filters for suction line (permanent use, with and without automatic bypass)

→ FACY

■ Applications

- Permanent refrigerant filtering, compressor and regulation element protection in refrigerating and air conditioning installations.
- Recommended use after commissioning, during circuit decontamination and refrigerant regeneration operations, and after the burn-out of a compressor.
- Particularly recommended for sealed groups, their automatic bypass system prevents a major drop in suction pressure.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- External steel body hermetically sealed with paint to ensure a high resistance to corrosion
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 10 microns, with a very low pressure drop.
- Presence of a permanent magnet at the intake of the filters, for steel metallic particle trapping.
- Several types of connections are possible on standard products:
 - To be screwed type SAE
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimeters (MMS)



Possible customization on demand:

- Specific connections (O-RING, ORFS, ...)

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Two access valves allow measurement of the filters' pressure drop, to check filter saturation.
- Permanent treatment until saturation and regular refrigerant distribution, through a tubular felt core, that creates a lower depression than in the connection piping.
- Internal automatic bypass system in case of filter blocking.
- Very economical cleaning process without loss of time, because the installation is still running during the operation.
- Environmental protection and refrigerants savings because, according to the refrigerants pollution level, using those cleaning filters allows the reuse of the refrigerant after its cleaning up.
- The copper-plated steel connections up to a diameter of 3/4" to be welded facilitate the brazing and allow using filler metals with a low silver percentage.
- GOST certified products



Cleaning filters for suction line

(permanent use, with and without automatic bypass)

→ FACY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;
- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.
- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in

chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the FACY Cleaning filters

- Cleaning filters are to be mounted on the suction line between the evaporator outlet and the compressor.
- On reversing cycle installations, FACY cleaning filters should always be installed between the inversion valve and the compressor.
- Never use these cleaning filters on the oil line; in such a case, use HCYF oil filters, or HYDROIL filter driers for POE oils (refer to chapters 45 and 47).
- Pay attention to the filters' assembly order, because the automatic bypass operation depends on the refrigerant direction indicated on the filter tag.
- In the event of compressor burnout, the cleaning and pollution control procedure is described in the FACY cleaning filter chapter (refer to chapter 15).
- FACY cleaning filters used for these operations are perfectly interchangeable with FACY filters; therefore, they can be temporarily mounted instead of FACY filters.
- Closely monitor the pressure drops using the access valves, in order to prevent shortage of the refrigerant vapour required to cool the compressor engine.
- Upon saturation or when the bypass system is used, filters have to be replaced.
- The replacement of the cleaning filters is imperative when the pressure drop measured in the filter is too large. As a precaution, CARLY recommends this operation at least once a year.
- Make sure that the piping can support, without deformation, the weight of the filter drier; otherwise, plan the attachment of the filter drier with a clamp on a stable part of the installation.



Cleaning filters for suction line

(permanent use, with and without automatic bypass)

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→ FACY

■ Selection table

CARLY references	Connections		CARLY references	Connections	Refrigerating capacity kW ⁽¹⁾			
	To screw SAE inch	To solder ODF inch			To solder ODF mm	R134a	R404A R507	R22 R407C R410A R407F
FACY 283	3/8				5,13	3,67	5,58	6,3
FACY 284	1/2				8,55	6,11	9,31	10,5
FACY 285	5/8				19,33	13,81	21,03	23,8
FACY 285 S/MMS		5/8	FACY 285 S/MMS	16	19,33	13,81	21,03	23,8
FACY 286 S		3/4	FACY 286 MMS	18	27,63	19,74	30,06	34,0
FACY 287 S/MMS		7/8	FACY 287 S/MMS	22	34,73	24,81	37,78	42,7
FACY 289 S		1 1/8	FACY 289 MMS	28	44,31	31,65	48,21	54,5
FACY 489 S		1 1/8	FACY 489 MMS	28	52,61	37,58	57,23	64,7
FACY 4811 S/MMS		1 3/8	FACY 4811 S/MMS	35	63,98	45,70	69,61	78,7
FACY 4813 S		1 5/8	FACY 4813 MMS	42	69,97	49,98	76,12	86,1

⁽¹⁾ Refrigerating capacities according to Standard ARI 730-2001 for To = 4.4 °C, Tk = 32 °C.

If different conditions, refer to correction factors in chapter 112.

Nota: the diameter of connections must not be inferior to the diameter of the main pipe.

⁽²⁾ Refrigerating capacities Qn for Tk = -10 °C and To = -40 °C

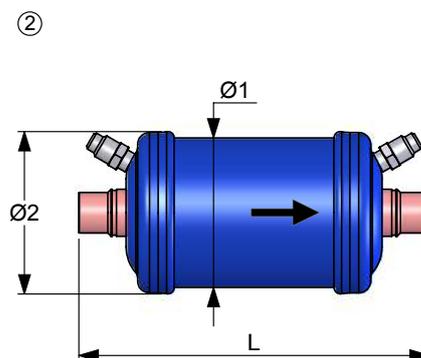
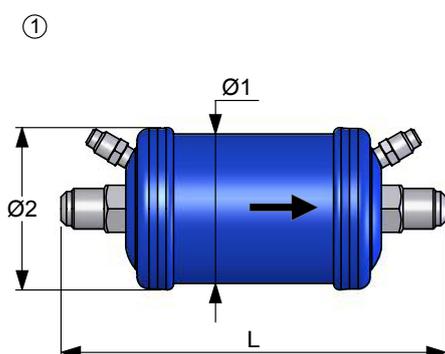
For Tk = 0 °C Qo = Qn + 12 %, For To = -30 °C Qo = Qn - 2 %

For Tk = -20 °C Qo = Qn - 10 %, For To = -20 °C Qo = Qn - 6 %

■ Technical features

CARLY references	Connection types ⁽¹⁾	Drawing Nb	Filtering surface cm ²	Dimensions mm		
				Ø1	Ø2	L
FACY 283	1	1	150	70	76	226
FACY 284	1	1	150	70	76	230
FACY 285	1	1	150	70	76	234
FACY 285 S/MMS	2	2	150	70	76	214
FACY 286 S	FACY 286 MMS	2	150	70	76	220
FACY 287 S/MMS	2	2	150	70	76	234
FACY 289 S	FACY 289 MMS	3	150	70	76	244
FACY 489 S	FACY 489 MMS	3	356	89	96	317
FACY 4811 S/MMS	3	2	356	89	96	337
FACY 4813 S	FACY 4813 MMS	3	356	89	96	337

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).





Cleaning filters for suction line

(permanent use, with and without automatic bypass)

→ FACY

■ Technical features

CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾	
								V L
FACY 283	0,58	46	15	80	-40	-30	Art3§3	
FACY 284	0,58	46	15	80	-40	-30	Art3§3	
FACY 285	0,58	46	15	80	-40	-30	Art3§3	
FACY 285 S/MMS	0,58	46	15	80	-40	-30	Art3§3	
FACY 286 S	FACY 286 MMS	0,58	46	15	80	-40	-30	Art3§3
FACY 287 S/MMS		0,59	46	15	80	-40	-30	Art3§3
FACY 289 S	FACY 289 MMS	0,60	46	15	80	-40	-30	Art3§3
FACY 489 S	FACY 489 MMS	1,39	46	15	80	-40	-30	I
FACY 4811 S/MMS		1,40	46	15	80	-40	-30	I
FACY 4813 S	FACY 4813 MMS	1,42	46	15	80	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FACY 283	0,94	0,90	1
FACY 284	0,99	0,95	1
FACY 285	1,04	1,00	1
FACY 285 S/MMS	1,04	1,00	1
FACY 286 S & MMS	1,04	1,00	1
FACY 287 S/MMS	1,04	1,00	1
FACY 289 S & MMS	1,14	1,10	1
FACY 489 S & MMS	1,77	1,70	1
FACY 4811 S/MMS	1,97	1,90	1
FACY 4813 S & MMS	2,07	2,00	1

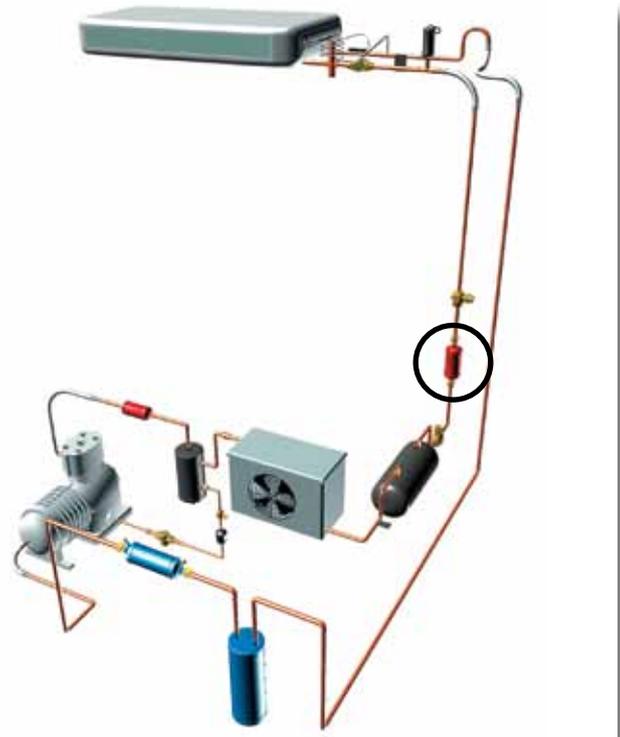


Cleaning filters for suction line (temporary use)

→ NCY

■ Applications

- Cleaning and decontamination of refrigerant circuits in refrigerating and air conditioning installations.
- Temporary uses:
 - new installations during start-up period for a very efficient protection of compressors against all types of dirt.
 - existing installations for an efficient cleaning of the refrigerant after compressor burnout.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 25 microns, with a very low pressure drop.
- No desorption, even at high temperatures.
- A dispenser located at the intake ensures optimal distribution and permanent treatment of the whole refrigerant, inside the cleaning filter driers.
- They integrate all the elements of the filter driers DCY, plus:
 - A decantation filter located at the intake to stop the flow of particles such as iron and copper oxides, carbon, foundry sand, etc.
 - Active charcoal to contain the waxes, the oily sludge, etc.
 - A permanent magnet located at the intake that traps the steel particles (except for models NCY 63 and 63 S/MMS).
- Several types of connections are possible on standard products:
 - To be screwed type SAE
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimeters (MMS).



Possible customization on demand:

- Specific connections (O-RING, ORFS, ...)

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Great efficiency for acid, wax binding and oily sludge neutralization at all temperatures, thanks to a fair distribution of chemical agents present in the filters: molecular sieves, activated alumina, active charcoal.
- Chemical agents in the form of free grain, for increased performance and elimination of the risk of polluting the circuit with solid particles, consecutive to drying core break-up.
- Very economical cleaning process with no loss of time, because the installation is still running during the operation.
- Environmental protection and savings of refrigerant, because using these cleaning filters allows re-use of the refrigerant after pollution control.
- Two access valves that allow filter pressure drop measurement, and define its level of saturation (except for models NCY 63 and 63 S/MMS).
- The copper-plated steel connections facilitate the brazing and allow using filler metals with a low silver percentage.
- GOST certified products.



Cleaning filters for suction line (temporary use)

→ NCY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the NCY Cleaning filter driers

- Cleaning filter driers are to be mounted on the suction line between the evaporator outlet and the compressor or in the liquid line just after the receiver.
- The refrigerant flow direction is indicated by an "IN" mark in the inlet shell of the filter drier and by an arrow on the filter tag. It must be necessarily respected.
- These filters are products intended for temporary use only; they should not be left permanently on the circuit.
- Closely monitor the pressure drop thanks to the access valves, in order to prevent shortage of the refrigerant vapour

required to cool the compressor engine. The replacement of the cleaning filters is imperative when the pressure drop measured in the filter is too large.

- After compressor burnout:
 - refer to the instructions given by the manufacturer, for circuit cleaning operations and compressor replacement
 - visually monitor the oil condition and acidity level with TESTOIL-MAS and TESTOIL-POE acidity tests (refer to chapter 91).
- The decontamination procedure of a refrigerating circuit, after compressor

burnout, using NCY cleaning filters, is identical to that for FNCY cleaning filters (description: refer to chapter 15).

- Make sure that the piping can support, without deformation, the weight of the cleaning filter; otherwise, plan the attachment of the cleaning filter with a clamp on a stable part of the installation.



Cleaning filters for suction line (temporary use)

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→ NCY

■ Selection table (in a suction line)

CARLY references	Connections		CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾				Dehydratable refrigerant capacity kg of refrigerant ⁽³⁾						
	To screw SAE inch	To solder ODF inch			R134a	R404A R507	R22 R407C R410A R407F	R744 CO ₂ ⁽²⁾	R22		R134a R410A		R404A R507		R744 CO ₂
									R407C	R407F	24 °C	52 °C	24 °C	52 °C	24 °C
NCY 63	3/8				1,4	1,0	1,5	1,7	15,0	14,5	17,0	15,5	14,5	13,5	9,1
NCY 63 S		3/8	NCY 63 MMS	10	1,4	1,0	1,5	1,7	15,0	14,5	17,0	15,5	14,5	13,5	9,1
NCY 73	3/8				3,9	2,8	4,3	4,8	40,0	34,0	50,0	37,0	38,0	31,0	24,3
NCY 73 S		3/8	NCY 73 MMS	10	3,9	2,8	4,3	4,8	40,0	34,0	50,0	37,0	38,0	31,0	24,3
NCY 74	1/2				5,2	3,7	5,7	6,4	40,0	34,0	50,0	37,0	38,0	31,0	24,3
NCY 74 S		1/2	NCY 74 MMS	12	5,2	3,7	5,7	6,4	40,0	34,0	50,0	37,0	38,0	31,0	24,3
NCY 75	5/8				13,1	9,3	14,2	15,9	70,0	61,0	80,5	69,0	69,5	56,0	42,5
NCY 75 S/MMS		5/8	NCY 75 S/MMS	16	13,1	9,3	14,2	15,9	70,0	61,0	80,5	69,0	69,5	56,0	42,5

⁽¹⁾ Refrigerating capacities according to Standard ARI 730-2001 for To = 4.4 °C, Tk = 32 °C and Δp = 0.21 bar. If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Refrigerating capacities Qn for Tk = -10 °C and To = -40 °C
For Tk = 0 °C Qo = Qn + 12 %, For To = -30 °C Qo = Qn - 2 %
For Tk = -20 °C Qo = Qn - 10 %, For To = -20 °C Qo = Qn - 6 %

⁽³⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86. Nota: the diameter of connections must not be inferior to the diameter of the main pipe.

■ Selection table (in a liquid line)

CARLY references	Connections		CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾				Dehydratable refrigerant capacity kg of refrigerant ⁽³⁾						
	To screw SAE inch	To solder ODF inch			R134a	R404A R507	R22 R407C R410A R407F	R744 CO ₂ ⁽²⁾	R22		R134a R410A		R404A R507		R744 CO ₂
									R407C	R407F	24 °C	52 °C	24 °C	52 °C	24 °C
NCY 63	3/8				23,0	17,0	24,5	27,4	6,5	5,5	7,0	6,0	6,5	5,5	3,9
NCY 63 S		3/8	NCY 63 MMS	10	23,0	17,0	24,5	27,4	6,5	5,5	7,0	6,0	6,5	5,5	3,9
NCY 73	3/8				24,0	18,0	25,0	28,0	6,5	5,5	7,0	6,0	6,5	5,5	3,9
NCY 73 S		3/8	NCY 73 MMS	10	24,0	18,0	25,0	28,0	6,5	5,5	7,0	6,0	6,5	5,5	3,9
NCY 74	1/2				40,0	32,0	43,0	48,2	9,5	9,0	11,5	10,0	9,5	8,0	5,8
NCY 74 S		1/2	NCY 74 MMS	12	40,0	32,0	43,0	48,2	9,5	9,0	11,5	10,0	9,5	8,0	5,8
NCY 75	5/8				68,0	51,0	72,0	80,6	9,5	9,0	11,5	10,0	9,5	8,0	5,8
NCY 75 S/MMS		5/8	NCY 75 S/MMS	16	68,0	51,0	72,0	80,6	9,5	9,0	11,5	10,0	9,5	8,0	5,8

⁽¹⁾ Refrigerating capacities according to Standard ARI 730-2001 for To = 4.4 °C, Tk = 32 °C and Δp = 0.07 bar. If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Refrigerating capacities Qn for Tk = -10 °C and To = -40 °C
For Tk = 0 °C Qo = Qn + 12 %, For To = -30 °C Qo = Qn - 2 %
For Tk = -20 °C Qo = Qn - 10 %, For To = -20 °C Qo = Qn - 6 %

⁽³⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86. Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



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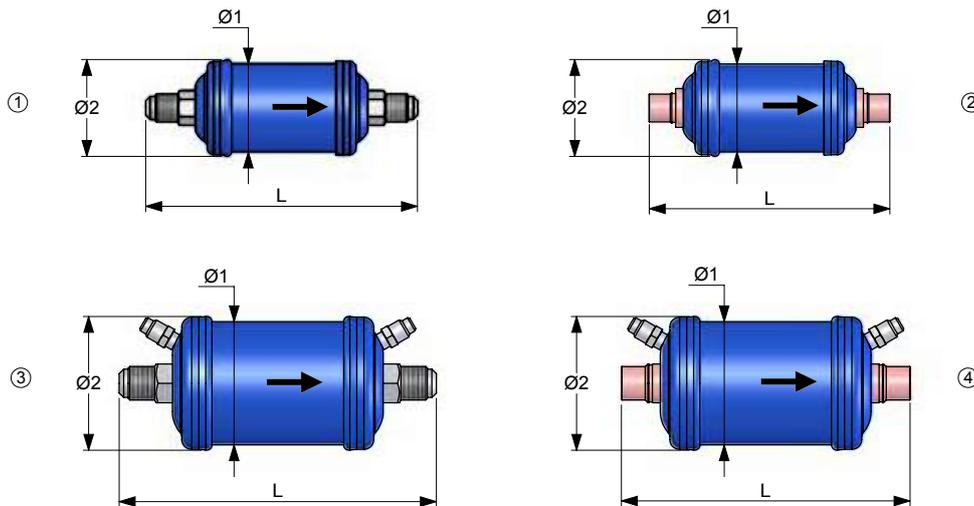
Cleaning filters for suction line (temporary use)

→ NCY

■ Technical features

CARLY references	Connection types ⁽¹⁾	Drawing Nb	Filtering surface cm ²	Volume desiccation products cm ³	Dimensions mm		
					Ø1	Ø2	L
NCY 63	1	1	52	125,0	50	55	156
NCY 63 S NCY 63 MMS	2	2	52	125,0	50	55	140
NCY 73	1	3	102	315,0	70	76	176
NCY 73 S NCY 73 MMS	2	4	102	315,0	70	76	160
NCY 74	1	3	102	315,0	70	76	180
NCY 74 S NCY 74 MMS	2	4	102	315,0	70	76	160
NCY 75	1	3	102	581,6	70	76	260
NCY 75 S/MMS	2	4	102	581,6	70	76	240

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).



CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
NCY 63	0,17	46	15	100	-40	-30	Art3§3
NCY 63 S NCY 63 MMS	0,17	46	15	100	-40	-30	Art3§3
NCY 73	0,39	46	15	100	-40	-30	Art3§3
NCY 73 S NCY 73 MMS	0,39	46	15	100	-40	-30	Art3§3
NCY 74	0,41	46	15	100	-40	-30	Art3§3
NCY 74 S NCY 74 MMS	0,41	46	15	100	-40	-30	Art3§3
NCY 75	0,41	46	15	100	-40	-30	Art3§3
NCY 75 S/MMS	0,41	46	15	100	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).



Cleaning filters for suction line (temporary use)

→ NCY

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
NCY 63	0,43	0,40	1
NCY 63 S & MMS	0,43	0,40	1
NCY 73	0,99	0,95	1
NCY 73 S & MMS	0,99	0,95	1
NCY 74	1,04	1,00	1
NCY 74 S & MMS	1,04	1,00	1
NCY 75	1,54	1,50	1
NCY 75 S/MMS	1,54	1,50	1

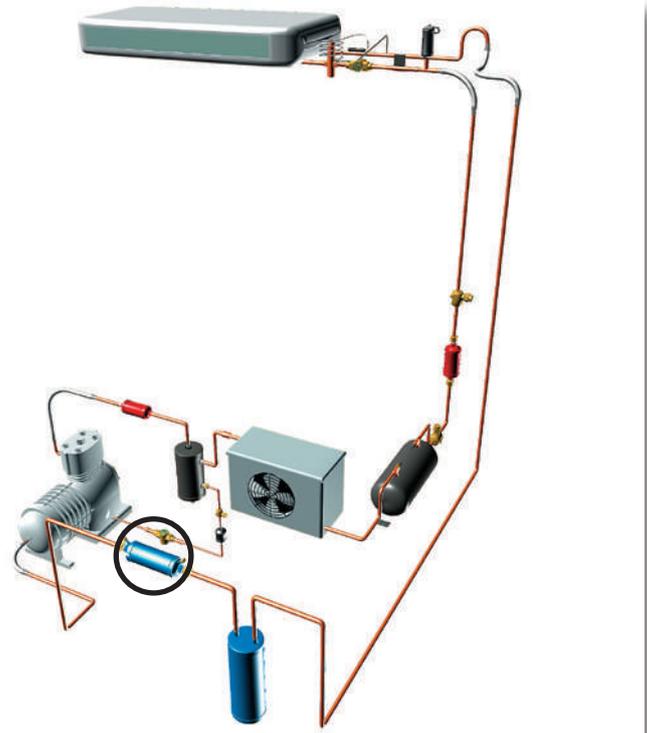


Cleaning filters for suction line (temporary use, special burnout)

→ FNCY

■ Applications

- Reinforced refrigerant circuits cleaning and decontamination in refrigerating and air conditioning installations.
- Temporary use for:
 - new installations during start-up period for a very efficient protection of compressors against all types of dirt.
 - existing installations for an efficient refrigerant cleaning after compressor burnout.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtering at outlet preventing propagation within the circuit of particles bigger than 10 microns, with a very low pressure drop.
- No desorption, even at high temperatures.
- They integrate all the elements of the filter driers DCY, plus :
 - A permanent magnet located at the intake that traps the steel particles.
 - Active charcoal to contain the waxes, the oily sludge, etc.
 - A felt core for an optimal filtration rate (which is not present in filters NCY)
 - Two access valves for checking pressure, which facilitates the monitoring of filter blocking.
- Several types of connections are possible on standard products:
 - To be screwed type SAE
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimeters (MMS).



Possible customization on demand:

- Specific connections (O-RING, ORFS, ...)

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Great efficiency for acid, wax binding and oily sludge neutralization at all temperatures, thanks to a fair distribution of chemical agents present in the filters: molecular sieves, activated alumina, active charcoal.
- Chemical agents in the form of free grains for increased performance and elimination of the risk of polluting the circuit with solid particles, consecutive to desiccant core break-up.
- Important retention capacity, without blocking risk and with minimum pressure drop.
- Very economical cleaning process without loss of time, because the installation is still running during the operation.
- Environmental protection and savings of refrigerant, because using these cleaning filters allows re-use of the refrigerant after pollution control.
- The copper-plated steel connections up to a diameter of 3/4" to be welded facilitate the brazing and allow using filler metals with a low silver percentage.
- GOST certified products.



Cleaning filters for suction line (temporary use, special burnout)

→ FNCY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the FNCY Cleaning filter driers

- The cleaning filter driers are to be mounted on the suction line between the evaporator outlet and the compressor.
- The refrigerant flow direction is indicated by an “IN” mark in the inlet shell of the filter drier and by an arrow on the filter tag. It must be necessarily respected.
- These filters are products intended for temporary use only; they should not be left permanently on the circuit.
- Closely monitor the pressure drop thanks to the two access valves, in order to

prevent shortage of the refrigerant vapour required to cool the compressor engine. The replacement of the cleaning filters is imperative when the pressure drop measured in the filter is too large.

- After compressor burnout:
 - Refer to instructions given by the manufacturer, for circuit cleaning operations and compressor replacement and apply the CARLY decontamination procedure described hereinafter.

- Visually monitor the oil condition and acidity level with TESTOIL-MAS and TESTOIL-POE acidity tests (refer to chapter 91).
- Make sure that the piping can support, without deformation, the weight of the cleaning filter; otherwise, plan the attachment of the cleaning filter with a clamp on a stable part of the installation.



Cleaning filters for suction line

(temporary use, special burnout)

→ FNCY

■ Decontamination procedure for a refrigerating circuit, after a compressor burnout, using FNCY cleaning filter driers

- 1 • Evaluate the importance of the circuit contamination. If the pollution present in the refrigerating circuit is not too high, it is economical to recover the refrigerant for re-use after treatment.
- 2 • Install replacement compressor and perform usual checks.
- 3 • Make sure that the part of the suction line immediately upstream of the compressor is clean.
- 4 • Replace all filters on the liquid line by **NCY** sealed decontamination filter of a greater capacity than that required by the new installation.
- 5 • Install special **FNCY** «burnout» filter drier, selected according to the installation capacity, on the suction line as close as possible to the compressor
- 6 • For reverse cycle systems, **FNCY** should be installed between the inversion valve and the compressor.
- 7 • Check circuit air-tightness according to the art.
- 8 • Make vacuum in the installation.
- 9 • Put circuit back under pressure.
- 10 • Power up the installation.
Monitor **FNCY** pressure drop evolution using the valves provided to that effect.
- 11 • Replace filter if pressure drop becomes too important.
The acceptable values are:
 - 0.15 bar** for a low temperature application
 - 0.25 bar** for a positive refrigeration application
 - 0.50 bar** for an air conditioning applicationIncrease of pressure drop indicates that the **FNCY** is performing its decontamination role.
- 12 • Monitor system operation during the first four hours (this monitoring must be increased when the compressor is hermetic or hermetic accessible). Replace **FNCY** as often as necessary until pressure drop in **FNCY** remains acceptable.
- 13 • After 48 hours of operation in decontamination phase, proceed to an oil sampling; visually inspect the sampling's condition and check the oil acidity level using **TESTOIL** oil acidity tests: **TESTOIL-POE** for polyol-ester oils or **TESTOIL-MAS** for synthetic alkylbenzene mineral oils (refer to chapter 91). If this sampling shows a non-satisfactory quality, drain oil, replace oil filter **HCYF** or **HYDROIL** and **FNCY**.

Repeat the operation starting from phase 10.
- 14 • After about 15 days, proceed to a new oil analysis by repeating phase 14 operation.
If it is satisfactory, repeat the operation starting from phase 1.
- 15 • When the procedure is finished, replace the cleaning filter **FNCY** by an equivalent filter **FACY** and the cleaning filter **NCY** by an equivalent filter drier **DCY**.

▲ This process ensures complete circuit decontamination and pollution control, thus protecting the new compressor and all the other components of a refrigerating circuit after compressor burnout.



Cleaning filters for suction line

(temporary use, special burnout)

→ FNCY

■ Selection table

CARLY references	Connections		CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾				Dehydratable refrigerant capacity kg of refrigerant ⁽³⁾						
	To screw SAE inch	To solder ODF inch			R134a	R404A	R22 R407C R410A R407F	R744 CO ₂ ⁽²⁾	R22		R134a R410A		R404A R507		R744 CO ₂
									R407C	R407F	24 °C	52 °C	24 °C	52 °C	24 °C
FNCY 283	3/8				1,37	0,98	1,49	1,5	38,5	32,5	40	38,5	61	34	23,4
FNCY 284	1/2				3,93	2,81	4,28	4,4	38,5	32,5	40	38,5	61	34	23,4
FNCY 285	5/8				6,59	4,70	7,17	7,4	38,5	32,5	40	38,5	61	34	23,4
FNCY 285 S/MMS		5/8	FNCY 285 S/MMS	16	6,59	4,70	7,17	7,4	38,5	32,5	40	38,5	61	34	23,4
FNCY 286 S		3/4	FNCY 286 MMS	18	11,05	7,90	12,02	12,4	38,5	32,5	40	38,5	61	34	23,4
FNCY 287 S/MMS		7/8	FNCY 287 S/MMS	22	17,02	12,16	18,52	19,1	38,5	32,5	40	38,5	61	34	23,4
FNCY 489 S		1 1/8	FNCY 489 MMS	28	21,56	15,40	23,45	24,1	68,5	57,0	71	68,5	111	61	41,6
FNCY 4811 S/MMS		1 3/8	FNCY 4811 S/MMS	35	41,91	29,94	45,60	46,9	68,5	57,0	71	68,5	111	61	41,6
FNCY 4813 S		1 5/8	FNCY 4813 MMS	42	45,85	32,75	49,88	51,4	68,5	57,0	71	68,5	111	61	41,6

⁽¹⁾ Refrigerating capacities according to Standard ARI 730-2001 for $T_o = 4.4\text{ °C}$, $T_k = 32\text{ °C}$.
If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Refrigerating capacities Q_n for $T_k = -10\text{ °C}$ and $T_o = -40\text{ °C}$
For $T_k = 0\text{ °C}$ $Q_o = Q_n + 12\%$, For $T_o = -30\text{ °C}$ $Q_o = Q_n - 2\%$
For $T_k = -20\text{ °C}$ $Q_o = Q_n - 10\%$, For $T_o = -20\text{ °C}$ $Q_o = Q_n - 6\%$

⁽³⁾ Dehydratable refrigerant capacity according to Standard ARI 710-86.
Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



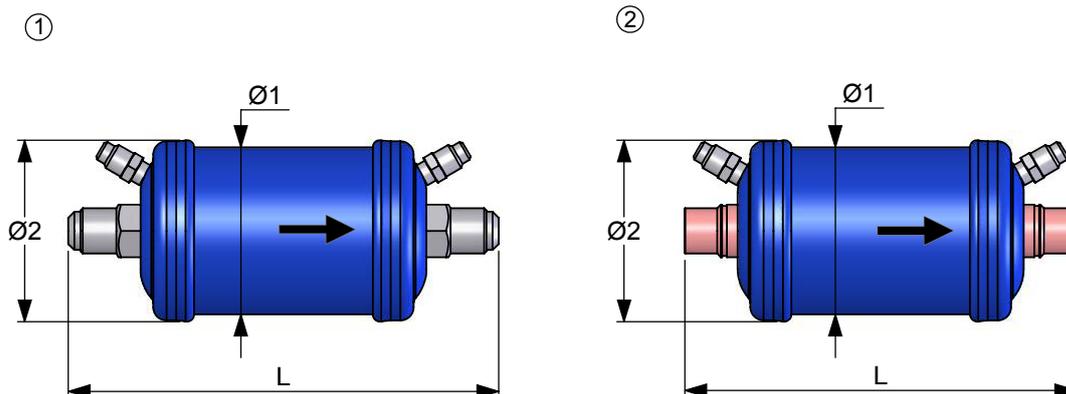
Cleaning filters for suction line (temporary use, special burnout)

→ FNCY

■ Technical features

CARLY references	Connection types ⁽¹⁾	Drawing Nb	Filtering surface cm ²	Volume desiccation products cm ³	Dimensions mm			
					Ø1	Ø2	L	
FNCY 283	1	1	150	290	70	76	226	
FNCY 284	1	1	150	290	70	76	230	
FNCY 285	1	1	150	290	70	76	234	
FNCY 285 S/MMS	2	2	150	290	70	76	214	
FNCY 286 S	FNCY 286 MMS	2	2	150	290	70	76	220
FNCY 287 S/MMS		2	2	150	290	70	76	234
FNCY 489 S	FNCY 489 MMS	3	2	356	550	89	96	317
FNCY 4811 S/MMS		3	2	356	550	89	96	337
FNCY 4813 S	FNCY 4813 MMS	3	2	356	550	89	96	337

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).



CARLY references	Volume V L	Maximal working pressure PS bar	Working pressure ⁽¹⁾ PS BT bar	Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature ⁽¹⁾ TS BT °C	CE Category ⁽²⁾	
								FNCY 283
FNCY 284	0,58	46	15	80	-40	-30	Art3§3	
FNCY 285	0,58	46	15	80	-40	-30	Art3§3	
FNCY 285 S/MMS	0,58	46	15	80	-40	-30	Art3§3	
FNCY 286 S	FNCY 286 MMS	0,59	46	15	80	-40	-30	Art3§3
FNCY 287 S/MMS		0,59	46	15	80	-40	-30	Art3§3
FNCY 489 S	FNCY 489 MMS	1,39	46	15	80	-40	-30	I
FNCY 4811 S/MMS		1,40	46	15	80	-40	-30	I
FNCY 4813 S	FNCY 4813 MMS	1,42	46	15	80	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).



Cleaning filters for suction line

(temporary use, special burnout)

→ FNCY

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FNCY 283	1,09	1,05	1
FNCY 284	1,14	1,10	1
FNCY 285	1,19	1,15	1
FNCY 285 S/MMS	1,19	1,15	1
FNCY 286 S & MMS	1,22	1,17	1
FNCY 287 S/MMS	1,24	1,20	1
FNCY 489 S & MMS	2,22	2,15	1
FNCY 4811 S/MMS	2,42	2,35	1
FNCY 4813 S & MMS	2,47	2,40	1

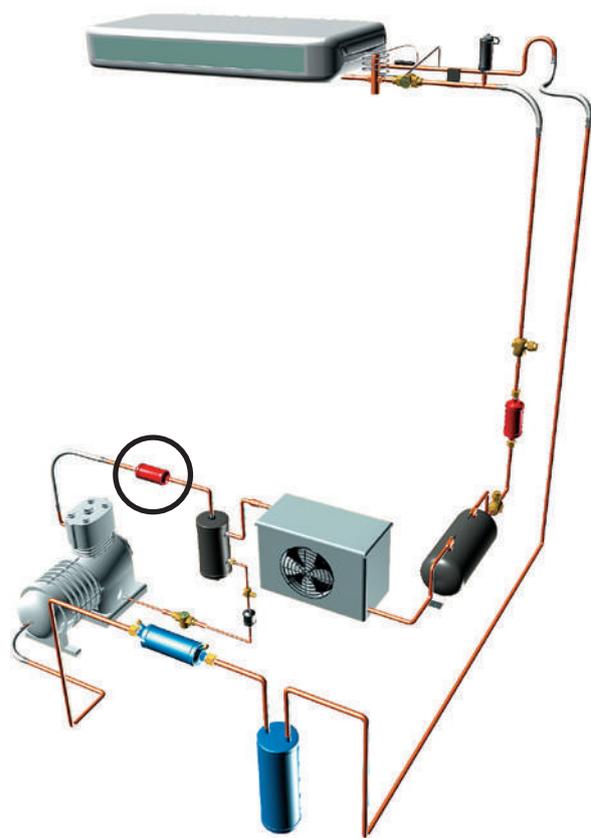


Discharge line mufflers

→ SCY

■ Applications

- Reduction of noise caused by gas pulses in the discharge lines of refrigerating and air conditioning installations. Those pulses generally come from reciprocating compressors or screw compressors. The mufflers have no effect on the mechanical vibrations transmitted to the pipes by the compressors; this is the role of the vibration eliminators EVCYAC or EVCYDEAC.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.

■ Possible customization on demand :

- Specific connections (O-RING, ORFS, ...)
- Aluminium casing and connections (weight optimisation)
- Stainless steel casings and connections (resistance to corrosion and at low temperature)
- Connections to braze 100 % copper.

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Design allows coverage of a wide range of frequencies.
- Discharge line muffler mounting is possible in vertical and horizontal positions. There is no oil trap whichever the position. The refrigerant can flow in both directions.
- Excellent distribution of the refrigerant in its gaseous phase, with minimum pressure drop.
- The copper-plated steel connections up to a diameter of 3/4"-18 mm facilitate the brazing and allow using brazing alloys with a low silver percentage.
- GOST certified products.



Discharge line mufflers

→ SCY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

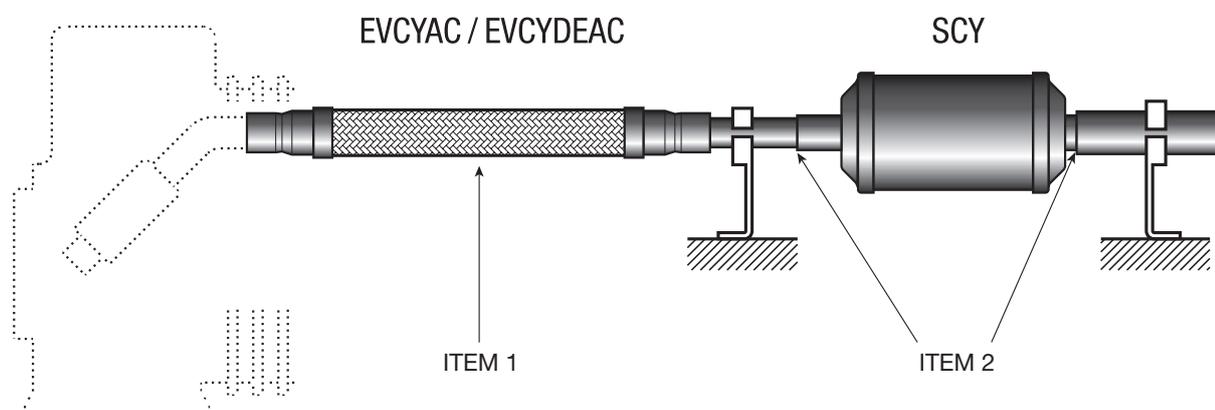
- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to SCY mufflers

- The discharge line mufflers are to be mounted on the discharge gas line between the compressor and the condenser; the muffler's connections diameter must correspond to the discharges pipes diameter.
- The optimum muffler position will be determined according to your installation's features, by getting in touch with your distributor or with CARLY's technical services.
- It is recommended to perform an inner connection at the intake point, and an outer connection at the muffler outlet point (refer to drawing below, item 2).
- In case of vertical assembling, it is recommended not to place the muffler just over the compressor.
- Provide for efficient clamping before the intake and after the outlet of the mufflers (refer to drawing below).
- For increased efficiency, it is imperative

to install, upstream of the discharge mufflers, that is to say between the muffler and the compressor, an EVCYAC standard or EVCYDEAC double-effect vibration eliminator (see drawing below, item 1 and to chapters 22 & 23).





Discharge line mufflers

→ SCY

■ Selection table

CARLY references	Connections To solder ODF pouce	CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾				Refrigerating capacity kW Subcritical CO ₂ ⁽²⁾		
				R22 R407F	R134a	R404A R507	R407C R410A	0 °C	- 20 °C	- 40 °C
SCY 30 S	3/8	SCY 30 MMS	10	7,0	5,5	8,0	7,5	20,9	16,3	12,8
SCY 40 S	1/2	SCY 40 MMS	12	11,5	9,0	14,0	13,5	38,2	29,8	23,4
SCY 50 S/MMS	5/8	SCY 50 S/MMS	16	19,0	15,0	22,5	22,0	61,9	48,2	37,8
SCY 60 S	3/4	SCY 60 MMS	18	27,5	21,5	32,5	31,5	92,8	72,3	56,7
SCY 70 S/MMS	7/8	SCY 70 S/MMS	22	38,5	30,0	45,5	43,5	132,4	103,1	80,9
SCY 90 S	1 1/8	SCY 90 MMS	28	60,0	47,0	71,0	68,0	243,3	189,6	148,7
SCY 110 S/MMS	1 3/8	SCY 110 S/MMS	35	94,0	73,5	111,0	108,0	409,2	318,8	250,1
SCY 130 S	1 5/8	SCY 130 MMS	42	134,0	105,0	160,0	152,0	648,2	505,0	396,2
SCY 170 S/MMS	2 1/8	SCY 170 S/MMS	54	229,0	179,5	273,5	260,0	Refrigerating capacities Q _n for T _k = + 10 °C For T _k = 0 °C Q ₀ = Q _n - 22 %, For T _k = - 10 °C Q ₀ = Q _n - 41 %, For T _k = - 20 °C Q ₀ = Q _n - 56 %.		
SCY 210 S	2 5/8	SCY 210 MMS	67	350,5	274,5	418,5	398,0			
SCY 250 S	3 1/8	SCY 250 MMS	80	497,5	390,0	594,5	565,0			

⁽¹⁾ Refrigerating capacities for To = 4 °C, Tk = 32 °C and Δp = 0,21 bar.
If different conditions, refer to correction factors in chapter 112.

⁽²⁾ Nota: the diameter of connections must not be inferior to the diameter of the main pipe.



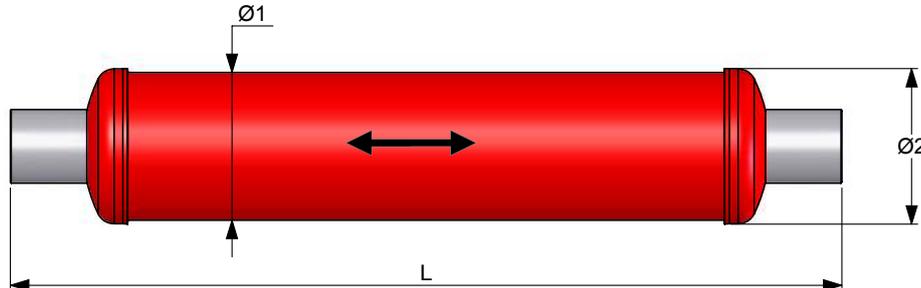
Discharge line mufflers

→ SCY

■ Technical features

CARLY references		Connections types ⁽¹⁾	Dimensions mm		
			Ø1	Ø2	L
SCY 30 S	SCY 30 MMS	2	50	55	161
SCY 40 S	SCY 40 MMS	2	50	55	161
SCY 50 S/MMS		2	50	55	165
SCY 60 S	SCY 60 MMS	2	89	96	168
SCY 70 S/MMS		2	89	96	182
SCY 90 S	SCY 90 MMS	3	89	96	282
SCY 110 S/MMS		3	89	96	302
SCY 130 S	SCY 130 MMS	3	89	96	302
SCY 170 S/MMS		3	121	128	675
SCY 210 S	SCY 210 MMS	3	152	156	624
SCY 250 S	SCY 250 MMS	3	152	156	871

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).



CARLY references		Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
SCY 30 S	SCY 30 MMS	0,19	46	15	120	-40	-30	Art3§3
SCY 40 S	SCY 40 MMS	0,19	46	15	120	-40	-30	Art3§3
SCY 50 S/MMS		0,19	46	15	120	-40	-30	Art3§3
SCY 60 S	SCY 60 MMS	0,56	46	15	120	-40	-30	Art3§3
SCY 70 S/MMS		0,57	46	15	120	-40	-30	Art3§3
SCY 90 S	SCY 90 MMS	1,09	46	15	120	-40	-30	I
SCY 110 S/MMS		1,10	46	15	120	-40	-30	I
SCY 130 S	SCY 130 MMS	1,12	46	15	120	-40	-30	I
SCY 170 S/MMS		5,59	46	15	120	-40	-30	II
SCY 210 S	SCY 210 MMS	7,90	46	15	120	-40	-30	II
SCY 250 S	SCY 250 MMS	12,57	46	15	120	-40	-30	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).



Discharge line mufflers

→ SCY

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
SCY 30 S & MMS	0,38	0,35	24
SCY 40 S & MMS	0,38	0,35	24
SCY 50 S/MMS	0,38	0,35	24
SCY 60 S & MMS	1,02	0,95	6
SCY 70 S/MMS	1,12	1,05	6
SCY 90 S & MMS	1,57	1,50	6

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
SCY 110 S/MMS	1,72	1,65	6
SCY 130 S & MMS	1,82	1,75	6
SCY 170 S/MMS	6,55	6,20	1
SCY 210 S & MMS	10,25	9,85	1
SCY 250 S & MMS	14,10	13,70	1



Discharge line mufflers

→ SCY-P6 / 64 bar (928 psig)

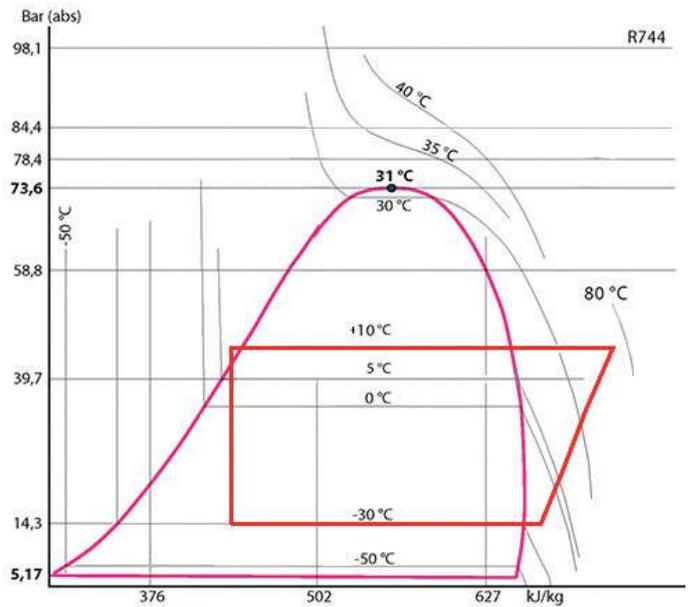
■ Applications

- Reduction of noise caused by gas pulses in the discharge lines of refrigerating and air conditioning installations, running with high working pressures.
- Those pulses generally come from reciprocating compressors or screw compressors. The mufflers have no effect on the mechanical vibrations transmitted to the pipes by the compressors.



64 bar

CO₂ SUBCRITICAL



■ Functional features

- Products are compatible with HFC, CO₂ as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Several types of connections are possible on standard products:
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimeters (MMS).



Possible customization on demand :

- Specific connections (SAE, O-RING, ORFS, ...).
- Stainless steel casings and connections (resistance to corrosion and at low temperature).

■ CARLY advantages

- Maximal working pressure: up to 64 bar with CO₂ in subcritical compression systems.
- Design allows coverage of a wide range of frequencies.
- Discharge line muffer mounting is possible in vertical and horizontal positions. There is no oil trap whichever the position. The refrigerant can flow in both directions.
- Excellent distribution of the refrigerant in its gaseous phase, with minimum pressure drop.
- The copper-plated steel connections up to a diameter of 3/4" - 18 mm facilitate the brazing and allow using brazing alloys with a low silver percentage.



Discharge line mufflers

→ SCY-P6 / 64 bar (928 psig)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 to CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component,

and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;

- Other are general to all CARLY components,

they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to SCY-P6 mufflers

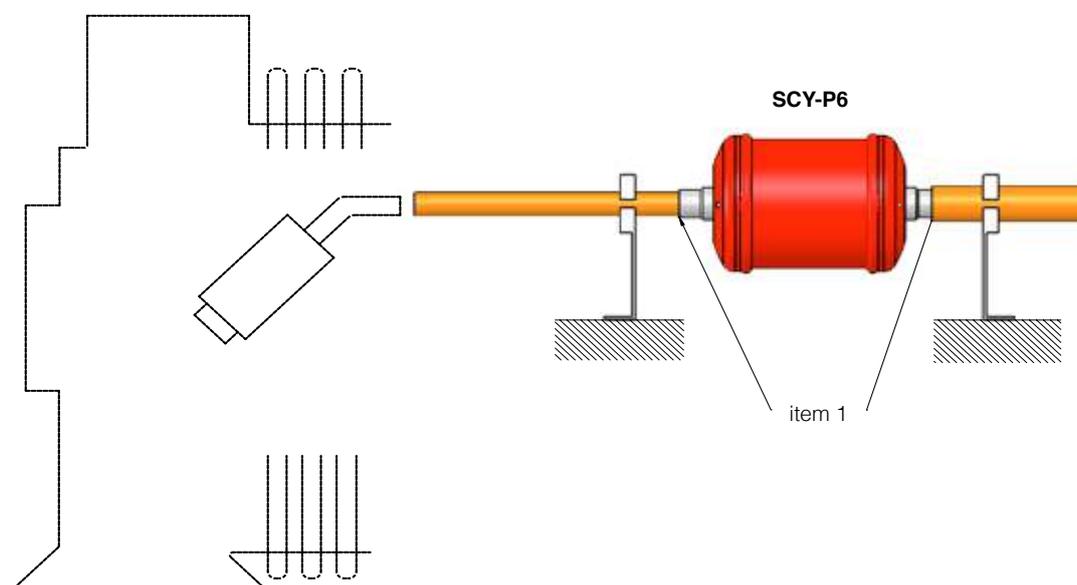
- The discharge line mufflers are to be mounted on the discharge gas line between the compressor and the condenser; the muffler's connections diameter must correspond to the discharges pipes diameter.
- The optimum muffler position will be determined according to your

installation's features, by getting in touch with your distributor or with CARLY's technical services.

- It is recommended to perform an inner connection at the intake point, and an outer connection at the muffler outlet point (refer to drawing below item 1).

- In case of vertical assembling, it is recommended not to place the muffler just over the compressor.

- Provide for efficient clamping before the intake and after the outlet of the mufflers (refer to drawing below).





Discharge line mufflers

→ SCY-P6 / 64 bar (928 psig)

■ Special precautions for components used with CO₂ in subcritical systems

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The hot gas defrost, frequently used with CO₂ for low temperatures applications, generates also high pressures (to take in consideration)
- The implementation on the liquid line of a filter drier **DCY-P6**, or a filter drier shell **BCY-P6** equipped with drying cores **CCY 48 HP** or **PLATINIUM 48**, is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly mufflers SCY-P6 do not have polymer gaskets directly in contact with CO₂.



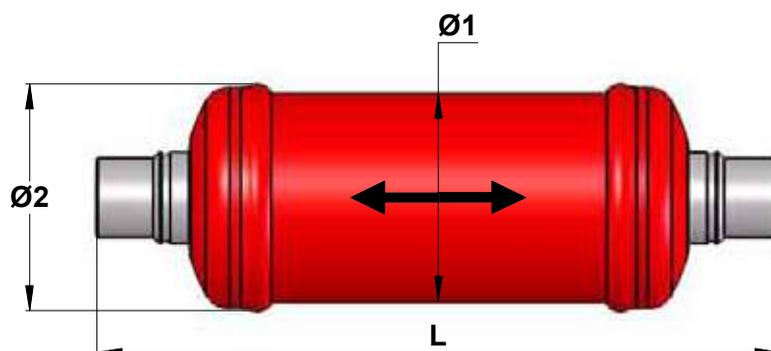
Discharge line mufflers

→ SCY-P6 / 64 bar (928 psig)

■ Technical features

CARLY references	Connections ⁽¹⁾		Dimensions mm			
	To solder ODF	CARLY references	To solder ODF	Ø1	Ø2	L
	pouce		mm			
SCY-P6 30 S	3/8	SCY-P6 30 MMS	10	50	55	159
SCY-P6 40 S	1/2	SCY-P6 40 MMS	12	50	55	159
SCY-P6 50 S/MMS	5/8		16	50	55	163
SCY-P6 60 S	3/4	SCY-P6 60 MMS	18	89	96	171
SCY-P6 70 S/MMS	7/8		22	89	96	185

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114 of CARLY technical catalogue).



CARLY references		Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
		V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
SCY-P6 30 S	SCY-P6 30 MMS	0,19	64	15	140	-40	-30	Art3§3
SCY-P6 40 S	SCY-P6 40 MMS	0,19	64	15	140	-40	-30	Art3§3
SCY-P6 50 S/MMS		0,19	64	15	140	-40	-30	Art3§3
SCY-P6 60 S	SCY-P6 60 MMS	0,56	64	15	140	-40	-30	Art3§3
SCY-P6 70 S/MMS		0,57	64	15	140	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0 of CARLY technical catalogue).



Discharge line mufflers

→ SCY-P6 / 64 bar (928 psig)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
SCY-P6 30 S & MMS	0,41	0,38	1
SCY-P6 40 S & MMS	0,41	0,38	1
SCY-P6 50 S/MMS	0,41	0,38	1
SCY-P6 60 S & MMS	1,32	1,27	1
SCY-P6 70 S/MMS	1,32	1,27	1



Discharge line mufflers

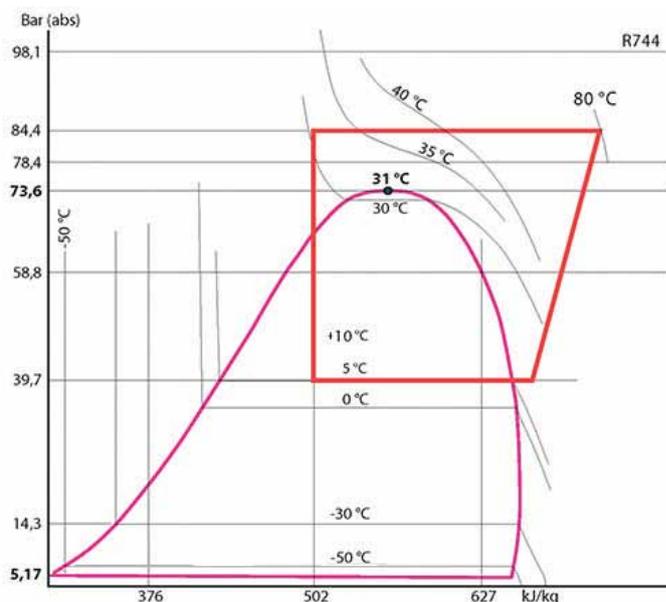
→ SCY-P14 / 140 bar (2030 psig)

■ Applications

- Reduction of noise caused by gas pulses in the discharge lines of refrigerating and air conditioning installations, running with high working pressures, with CO₂ in transcritical compression systems.
- Those pulses generally come from reciprocating compressors or screw compressors. The mufflers have no effect on the mechanical vibrations transmitted to the pipes by the compressors.

140 bar

CO₂ TRANSCRITICAL



■ Functional features

- Products are compatible with CO₂ as well as with its associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Connections on standard products: to solder ODF.

Possible customization on demand :

- Stainless steel casings and connections (resistance to corrosion and at low temperature)

■ CARLY advantages

- Maximal working pressure: up to 140 bar with CO₂ in transcritical compression systems.
- Design allows coverage of a wide range of frequencies.
- Discharge line muffler mounting is possible in vertical and horizontal positions. There is no oil trap whichever the position. The refrigerant can flow in both directions.
- Excellent distribution of the refrigerant in its gaseous phase, with minimum pressure drop.



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Discharge line mufflers

→ SCY-P14 / 140 bar (2030 psig)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

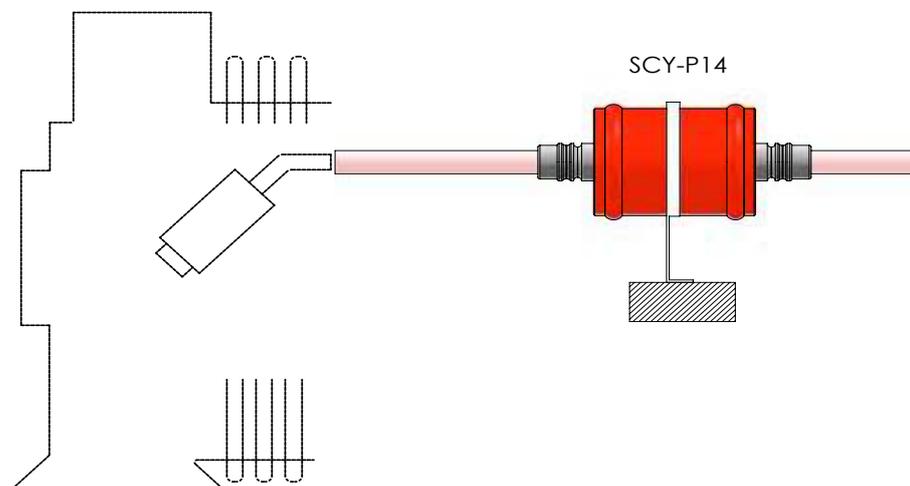
- Some are specific to each component,
- Other are general to all CARLY components,

and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;

they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to SCY-P14 mufflers

- The discharge line mufflers are to be mounted on the discharge gas line between the compressor and the condenser; the muffler's connections diameter must correspond to the discharges pipes diameter.
- The optimum muffler position will be determined according to your installation's features, by getting in touch with your distributor or with CARLY's technical services.
- Provide for an efficient clamping directly on the muffler (refer to drawing below).
- In case of vertical assembling, it is recommended not to place the muffler just over the compressor.
- Provide for efficient clamping directly on the muffler (refer to drawing below).





Discharge line mufflers

→ SCY-P14 / 140 bar (2030 psig)

■ Special precautions for components used with CO₂ in transcritical systems

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The hot gas defrost, frequently used with CO₂ for low temperatures applications, generates also high pressures (to take in consideration)
- The implementation on the liquid line of a filter drier **DCY-P14**, or a filter drier shell **BCY-P14** equipped with drying cores **CCY 48 HP** or **PLATINIUM 48**, is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice and even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly mufflers SCY-P14 do not have polymer gaskets directly in contact with CO₂.



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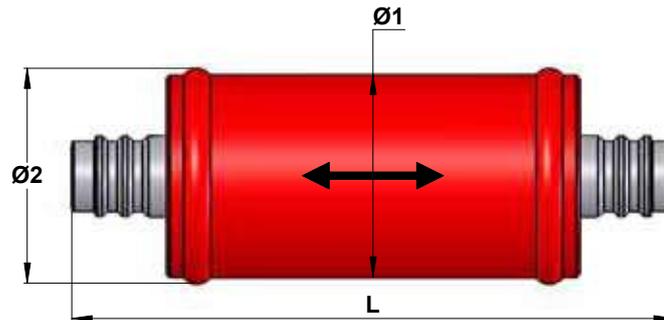
Discharge line mufflers

→ SCY-P14 / 140 bar (2030 psig)

■ Technical features

CARLY references	Connections to solder ODF inch	CARLY references	Connections to solder ODF mm	Connections types ⁽¹⁾	Dimensions mm		
					Ø1	Ø2	L
SCY-P14 30 S/MMS	3/8		10	4	60	64	162
SCY-P14 40 S/MMS	1/2		12	4	60	64	178
SCY-P14 50 S/MMS	5/8		16	5	60	64	178
SCY-P14 60 S	3/4	SCY-P14 60 MMS	18	5	89	92	206
SCY-P14 70 S/MMS	7/8		22	5	89	92	206
SCY-P14 90 S	1 1/8	SCY-P14 90 MMS	28	6	114	118	314
SCY-P14 110 S/MMS	1 3/8		35	5	114	118	318

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114 of CARLY technical catalogue).



CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
SCY-P14 30 S/MMS	0,20	140	15	140	-40	-30	Art 3§3
SCY-P14 40 S/MMS	0,20	140	15	140	-40	-30	Art 3§3
SCY-P14 50 S/MMS	0,20	140	15	140	-40	-30	Art 3§3
SCY-P14 60 S	SCY-P14 60 MMS	0,41	140	15	140	-40	Cat I
SCY-P14 70 S/MMS		0,41	140	15	140	-40	Cat I
SCY-P14 90 S	SCY-P14 90 MMS	1,30	140	15	140	-40	Cat I
SCY-P14 110 S/MMS		1,30	140	15	140	-40	Cat I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0 of CARLY technical catalogue).



Discharge line mufflers

→ SCY-P14 / 140 bar (2030 psig)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
SCY-P14 30 S/MMS	1,33	1,20	1
SCY-P14 40 S/MMS	1,33	1,20	1
SCY-P14 50 S/MMS	1,33	1,20	1
SCY-P14 60 S & MMS	3,13	3,00	1
SCY-P14 70 S/MMS	3,13	3,00	1
SCY-P14 90 S & MMS	7,13	7,00	1
SCY-P14 110 S/MMS	7,13	7,00	1



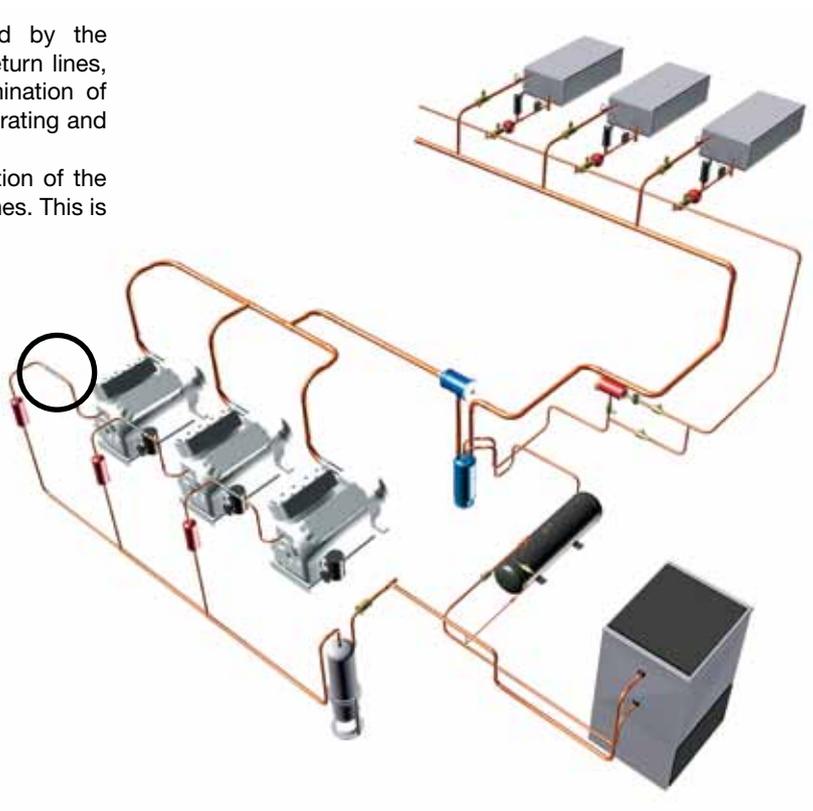
Stainless steel vibration eliminators, nickel-plated connections

CTCY-EN – 22.1-4 / 09-2015

→ EVCYAC

■ Applications

- Reduction of the mechanical vibrations transmitted by the compressor to the discharge, liquid, suction and oil return lines, and indirectly, of the noises they generate, and elimination of stresses linked with piping thermal expansion in refrigerating and air conditioning installations.
- The vibration eliminators have no effect on the reduction of the noises caused by the gas pulsations in the discharge lines. This is the role of the mufflers SCY.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- Flexible wavy stainless steel metallic hoses constituted of parallel waves from a tube welded end to end and covered with a stainless steel wire braid (see sketch n° 2).
- Nickel-plated steel connections, for the standards models.
- Vibration eliminators are cleaned and dried before individual packaging under heat-sealed plastic tubular film.



Possible customization on request, even for unit needs :

- Specific lengths
- Stainless steel connections, for better resistance to corrosive environments (e.g. railway and maritime application, ...)
- Specific flanges or connections

■ CARLY advantages

- Maximal working pressure: until 46 bar.
- Specifically designed in order to resist frost and major temperature shifts, from - 40 °C to + 140 °C.
- Principle for connecting the components together (stainless steel hose + air-tightness ring + braid + connection) by stainless steel TIG weld. Contrary to a braze, this weld eliminates all risks of deteriorating the vibration eliminator by heat transfer during connection to the installation's piping.
- Very high mechanical resistance to corrosion.
- Long brazed or welded connections, in order to facilitate connection to installation.
- Unity helium air-tightness inspection.
- Marking meets perfectly the requirements of PED 97/23/CE.
- GOST certified products.



Stainless steel vibration eliminators, nickel-plated connections

→ EVCYAC

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to EVCYAC vibration eliminators

- Mounting of vibration eliminators should be performed:

→ on a piping straight-up part

→ As close as possible of the vibration generator: compressor, evaporator, condenser, etc... imperatively in horizontal position at compressor's suction.

→ without twisting, extension or axial compression stress. The vibration eliminator must be perfectly straight.

→ preferably 90° in relation to vibration source (refer to sketch No1).

- Warning, when put under pressure, the vibration eliminators can present a slight

extension (about 2 % of initial length); it is therefore necessary to take this into account during the assembly operation.

- For the brazing operation, we recommend the use of a filler metal with a high silver content (38 % minimum) and the use of a neutral gas inside the vibration eliminators in order to not trigger internal corrosion phenomena.

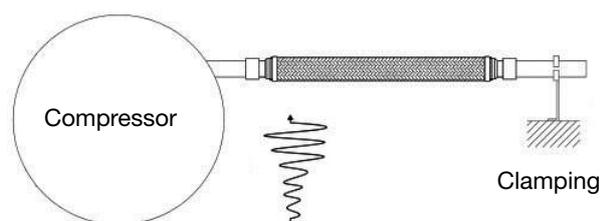
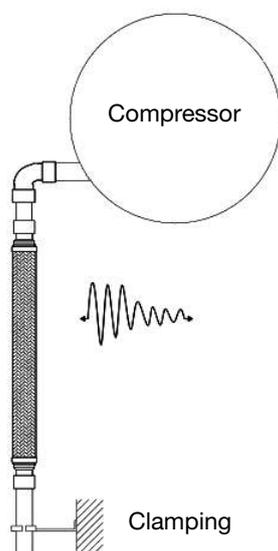
- During the brazing operation, be careful that the scouring flux used does not come in contact with the hose and its braid.

- The connections' nickel lining holds ready nicely during temperature increase; it is nevertheless recommended to protect

the connections after brazing with an appropriate product, against corrosion risks.

- Provide for clamping of the vibration eliminator ends that are located opposite the vibration source (refer to sketch No1).

- All arrangements must be taken, in order to prevent water concentration that may freeze and then deteriorate the vibration eliminator.



Sketch No 1



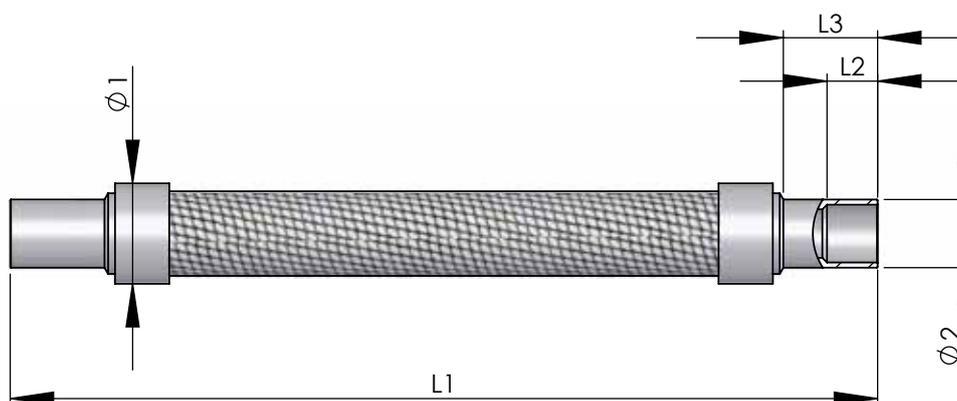
Stainless steel vibration eliminators, nickel-plated connections

CTCY-EN – 22.1-4 / 09-2015

→ EVCYAC

■ Technical features

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Dimensions mm				
				Ø1	Ø2	L1	L2	L3
EVCYAC 2 S	1/4	EVCYAC 2 MMS	6,0	14	9	200	6	16
EVCYAC 3 S	3/8	EVCYAC 3 MMS	10,0	18	13	221	9	21
EVCYAC 4 S	1/2	EVCYAC 4 MMS	12,0	19	16	242	11	24
EVCYAC 5 S	5/8	EVCYAC 5 MMS	15,0	25	19	288	14	29
EVCYAC 6 S	3/4	EVCYAC 6 MMS	18,0	30	22	318	16	33
EVCYAC 7 S/MMS	7/8	EVCYAC 7 S/MMS	22,0	30	25	318	18	42
EVCYAC 9 S	1 1/8	EVCYAC 9 MMS	28,0	36	32	360	20	51
EVCYAC 11 S/MMS	1 3/8	EVCYAC 11 S/MMS	35,0	47	40	408	30	56
EVCYAC 13 S	1 5/8	EVCYAC 13 MMS	42,0	58	48	472	30	68
EVCYAC 17 S/MMS	2 1/8	EVCYAC 17 S/MMS	54,0	69	60	560	40	88
EVCYAC 21 S	2 5/8	EVCYAC 21 MMS	67,0	84	75	670	50	105
EVCYAC 25 S	3 1/8	EVCYAC 25 MMS	80,0	107	88	760	55	124
EVCYAC 29 S	3 5/8	EVCYAC 29 MMS	88,9	132	102	895	55	142
EVCYAC 33 S	4 1/8	EVCYAC 33 MMS	108,0	132	114	930	60	160





Stainless steel vibration eliminators, nickel-plated connections

→ EVCYAC

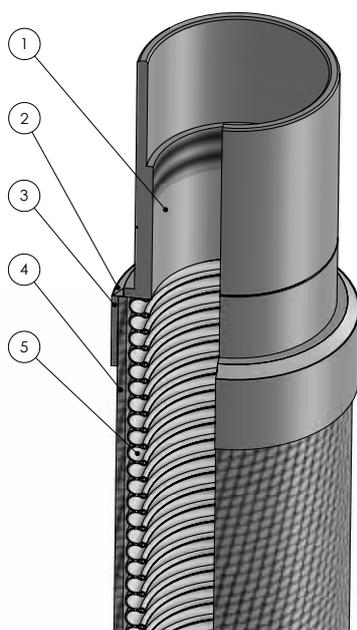
■ Technical features

CARLY references	Nominal diameter	CARLY references	Nominal diameter	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	DN inch		DN mm	PS bar	PS BT bar	TS maxi* °C	TS mini °C	TS BT °C	
EVCYAC 2 S	1/4	EVCYAC 2 MMS	6,0	46	15	140	-40	-30	Art3§3
EVCYAC 3 S	3/8	EVCYAC 3 MMS	10,0	46	15	140	-40	-30	Art3§3
EVCYAC 4 S	1/2	EVCYAC 4 MMS	12,0	46	15	140	-40	-30	Art3§3
EVCYAC 5 S	5/8	EVCYAC 5 MMS	15,0	46	15	140	-40	-30	Art3§3
EVCYAC 6 S	3/4	EVCYAC 6 MMS	18,0	42	15	100	-40	-30	Art3§3
EVCYAC 7 S/MMS	7/8	EVCYAC 7 S/MMS	22,0	42	15	100	-40	-30	Art3§3
EVCYAC 9 S	1 1/8	EVCYAC 9 MMS	28,0	42	15	100	-40	-30	Art3§3
EVCYAC 11 S/MMS	1 3/8	EVCYAC 11 S/MMS	35,0	35	15	120	-40	-30	I
EVCYAC 13 S	1 5/8	EVCYAC 13 MMS	42,0	35	15	120	-40	-30	I
EVCYAC 17 S/MMS	2 1/8	EVCYAC 17 S/MMS	54,0	34	15	120	-40	-30	I
EVCYAC 21 S	2 5/8	EVCYAC 21 MMS	67,0	25	15	120	-40	-30	I
EVCYAC 25 S	3 1/8	EVCYAC 25 MMS	80,0	20	15	120	-40	-30	I
EVCYAC 29 S	3 5/8	EVCYAC 29 MMS	88,9	20	15	120	-40	-30	I
EVCYAC 33 S	4 1/8	EVCYAC 33 MMS	108,0	20	15	120	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

* Other WT (working temperatures) possible on demand.



- 1 - Nickel plated steel connections (or, stainless steel, on request)
- 2 - TIG weld
- 3 - Stainless steel ring
- 4 - Stainless steel wire braid
- 5 - Flexible wavy stainless steel hose

Sketch No 2



Stainless steel vibration eliminators, nickel-plated connections

→ EVCYAC

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
EVCYAC 2 S et MMS	0,06	0,06	1
EVCYAC 3 S & MMS	0,07	0,07	1
EVCYAC 4 S et MMS	0,10	0,10	1
EVCYAC 5 S & MMS	0,15	0,15	1
EVCYAC 6 S et MMS	0,25	0,25	1
EVCYAC 7 S/MMS	0,25	0,25	1
EVCYAC 9 S et MMS	0,43	0,42	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
EVCYAC 11 S/MMS	0,77	0,76	1
EVCYAC 13 S et MMS	1,36	1,35	1
EVCYAC 17 S/MMS	2,13	2,12	1
EVCYAC 21 S et MMS	3,90	3,85	1
EVCYAC 25 S & MMS	5,65	5,60	1
EVCYAC 29 S et MMS	8,60	8,55	1
EVCYAC 33 S & MMS	9,20	9,15	1

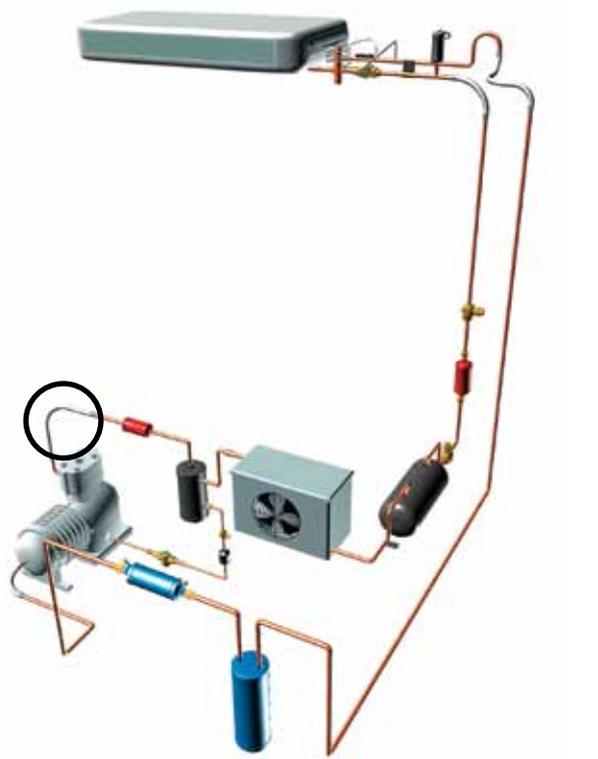


Stainless steel double effect vibration eliminators, nickel-plated connections

→ EVCYDEAC (double effect)

■ Applications

- Reduction of the mechanical vibrations transmitted by the compressor to the discharge, liquid, suction and oil return lines, and indirectly, of the noises they generate, and elimination of stresses linked with piping thermal expansion in refrigerating and air conditioning installations.
- Vibrations generated by a refrigerating compressor propagate in several directions, therefore, it is usually recommended to install two vibration eliminators placed at 90°; the use of EVCYDEAC double-effect vibration eliminators replaces this assembly, because it is possible to bend them at 90°.
- The vibration eliminators have no effect on the reduction of the noises caused by the gas pulsations in the discharge lines. This is the role of the mufflers SCY.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- Flexible wavy stainless steel metallic hoses constituted of parallel waves from a tube welded end to end and covered with a stainless steel wire braid (see sketch n° 2).
- Construction allows the use in a straight or curved position, with an imposed minimum radius of curvature (see technical specifications table below)
- Nickel-plated steel connections, for the standards models.
- Vibration eliminators are cleaned and dried before individual packaging under heat-sealed plastic tubular film.



Possible customization on request, even for unit needs:

- Specific lengths
- Stainless steel connections, for better resistance to corrosive environments (e.g. railway and maritime application, ...)
- Specific flanges or connections.

■ CARLY advantages

- Maximal working pressure: until 46 bar.
- Specifically designed in order to resist frost and major temperature shifts, from - 40 °C to + 140 °C.
- Principle for connecting the components together (stainless steel hose + air-tightness ring + braid + connection) by stainless steel TIG weld. Contrary to a braze, this weld eliminates all risks of deteriorating the vibration eliminator by heat transfer during connection to the installation's piping.
- Reduction of installation costs and of footprint, compared with the use of two vibration eliminators placed at 90°.
- Very high mechanical resistance to corrosion.
- Long brazed or welded connections, in order to facilitate connection to installation.
- Unity helium air-tightness inspection.
- Marking meets perfectly the requirements of PED 97/23/CE.
- GOST certified products.



Stainless steel double effect vibration eliminators, nickel-plated connections

→ EVCYDEAC (double effect)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to EVCYDEAC double effect vibration eliminators

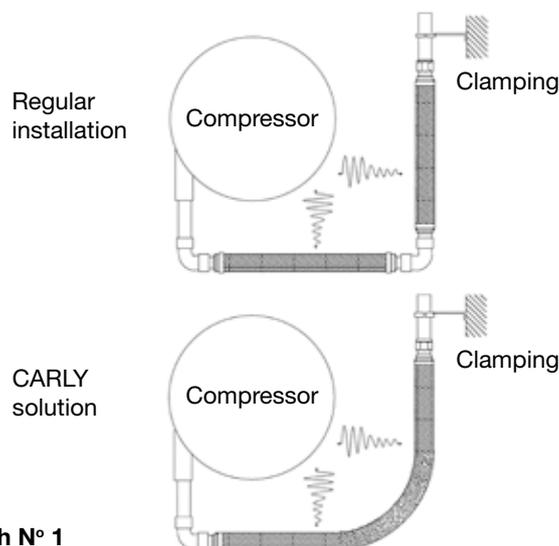
- Mounting of vibration eliminators should be performed:
 - As close as possible of the vibration generator: compressor, evaporator, condenser, etc ...
 - Imperatively in horizontal position at compressor's suction.
 - without twisting, extension or axial compression stress
 - without over-bending, or extension of the hose
 - preferably 90° in relation to vibration source, if straight-up mounting.
- Warning, when put under pressure, the vibration eliminators can present a slight

extension (about 2 % of initial length); it is therefore necessary to take this into account during the assembly operation.

- Respect the minimum radius of curvature (static and dynamic) indicated in the technical specifications table, and the configurations of sketch n° 3 hereafter.
- For the brazing operation, we recommend the use of filler metal with a high silver content (38 % minimum) and the use of a neutral gas inside the vibration eliminators in order to not trigger internal corrosion phenomena.
- During the brazing operation, be careful that the scouring flux used does not come

in contact with the hose and its braid.

- The nickel lining of the connections hold really nicely during temperature increase; it is nevertheless recommended to protect the connections after brazing with an appropriate product, against corrosion risks.
- Provide for clamping of the vibration eliminators ends that are located opposite the vibration source (refer to sketch N° 1).
- All arrangements must be taken, in order to prevent water concentration that may freeze and then deteriorate the vibration eliminator.



Sketch N° 1

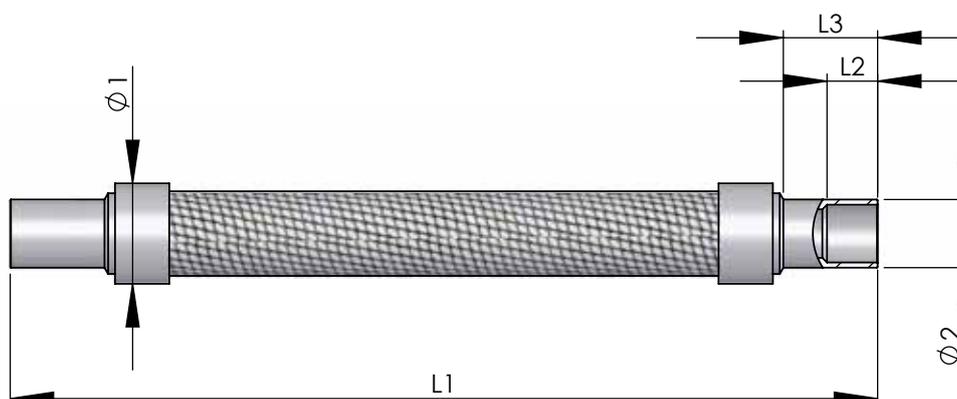


Stainless steel double effect vibration eliminators, nickel-plated connections

→ EVCYDEAC (double effect)

■ Technical features

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Dimensions mm					Minimal bending radius mm	
				Ø1	Ø2	L1	L2	L3	Statique	Dynamique
EVCYDEAC 2 S	1/4	EVCYDEAC 2 MMS	6,0	14	9	270	6	16	20	105
EVCYDEAC 3 S	3/8	EVCYDEAC 3 MMS	10,0	18	13	340	9	21	18	100
EVCYDEAC 4 S	1/2	EVCYDEAC 4 MMS	12,0	20	16	360	11	24	20	140
EVCYDEAC 5 S	5/8	EVCYDEAC 5 MMS	15,0	25	19	420	14	29	25	190
EVCYDEAC 6 S	3/4	EVCYDEAC 6 MMS	18,0	30	22	462	15	33	30	230
EVCYDEAC 7 S/MMS	7/8	EVCYDEAC 7 S/MMS	22,0	30	25	480	18	42	30	230
EVCYDEAC 9 S	1 1/8	EVCYDEAC 9 MMS	28,0	37	32	530	20	51	40	250
EVCYDEAC 11 S/MMS	1 3/8	EVCYDEAC 11 S/MMS	35,0	47	40	630	30	56	50	290
EVCYDEAC 13 S	1 5/8	EVCYDEAC 13 MMS	42,0	58	48	750	30	68	60	320
EVCYDEAC 17 S/MMS	2 1/8	EVCYDEAC 17 S/MMS	54,0	70	60	880	40	88	70	360
EVCYDEAC 21 S	2 5/8	EVCYDEAC 21 MMS	67,0	84	75	1060	50	105	80	420
EVCYDEAC 25 S	3 1/8	EVCYDEAC 25 MMS	80,0	108	88	1210	55	124	100	480
EVCYDEAC 29 S	3 5/8	EVCYDEAC 29 MMS	88,9	132	102	1560	55	142	120	580
EVCYDEAC 33 S	4 1/8	EVCYDEAC 33 MMS	108,0	135	114	1610	60	160	120	580





Stainless steel double effect vibration eliminators, nickel-plated connections

➔ EVCYDEAC (double effect)

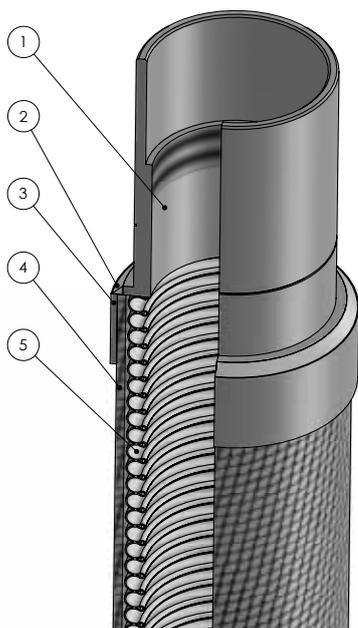
■ Technical features

CARLY references	Nominal diameter	CARLY references	Nominal diameter	Maximal working pressure	Working pressure (1)	Maximal working temperature	Minimal working temperature	Working temperature (1)	CE Category (2)
	DN inch		DN mm						
EVCYDEAC 2 S	1/4	EVCYDEAC 2 MMS	6,0	46	15	140	-40	-30	Art3§3
EVCYDEAC 3 S	3/8	EVCYDEAC 3 MMS	10,0	46	15	140	-40	-30	Art3§3
EVCYDEAC 4 S	1/2	EVCYDEAC 4 MMS	12,0	46	15	140	-40	-30	Art3§3
EVCYDEAC 5 S	5/8	EVCYDEAC 5 MMS	15,0	46	15	140	-40	-30	Art3§3
EVCYDEAC 6 S	3/4	EVCYDEAC 6 MMS	18,0	42	15	100	-40	-30	Art3§3
EVCYDEAC 7 S/MMS	7/8	EVCYDEAC 7 S/MMS	22,0	42	15	100	-40	-30	Art3§3
EVCYDEAC 9 S	1 1/8	EVCYDEAC 9 MMS	28,0	42	15	100	-40	-30	Art3§3
EVCYDEAC 11 S/MMS	1 3/8	EVCYDEAC 11 S/MMS	35,0	35	15	120	-40	-30	I
EVCYDEAC 13 S	1 5/8	EVCYDEAC 13 MMS	42,0	35	15	120	-40	-30	I
EVCYDEAC 17 S/MMS	2 1/8	EVCYDEAC 17 S/MMS	54,0	34	15	120	-40	-30	I
EVCYDEAC 21 S	2 5/8	EVCYDEAC 21 MMS	67,0	25	15	120	-40	-30	I
EVCYDEAC 25 S	3 1/8	EVCYDEAC 25 MMS	80,0	20	15	120	-40	-30	I
EVCYDEAC 29 S	3 5/8	EVCYDEAC 29 MMS	88,9	20	15	120	-40	-30	I
EVCYDEAC 33 S	4 1/8	EVCYDEAC 33 MMS	108,0	20	15	120	-40	-30	I

(1) The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

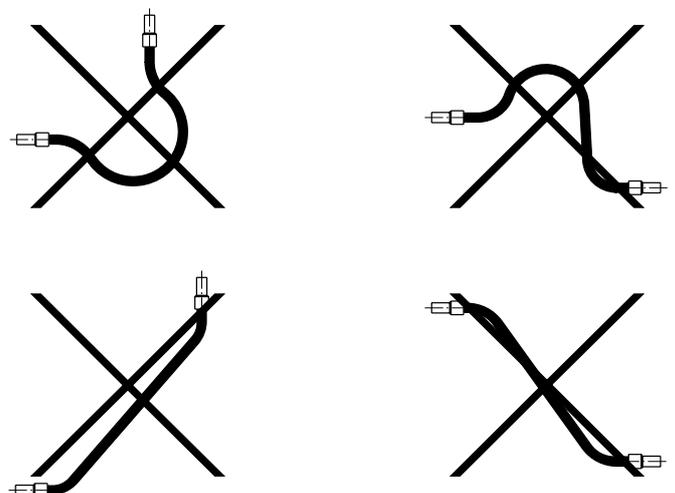
(2) Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

* Other WT (working temperatures) possible on demand.



- 1 - Nickel plated steel connections (or, stainless steel, on request)
- 2 - TIG weld
- 3 - Stainless steel ring
- 4 - Stainless steel wire braid
- 5 - Flexible wavy stainless steel hose

Sketch N° 2



Sketch N° 3



Stainless steel double effect vibration eliminators, nickel-plated connections

→ **EVCYDEAC** *(double effect)*

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
EVCYDEAC 2 S et MMS	0,07	0,07	1
EVCYDEAC 3 S & MMS	0,12	0,12	1
EVCYDEAC 4 S et MMS	0,17	0,17	1
EVCYDEAC 5 S & MMS	0,26	0,26	1
EVCYDEAC 6 S et MMS	0,37	0,37	1
EVCYDEAC 7 S/MMS	0,42	0,42	1
EVCYDEAC 9 S et MMS	0,69	0,68	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
EVCYDEAC 11 S/MMS	1,16	1,15	1
EVCYDEAC 13 S et MMS	1,50	1,49	1
EVCYDEAC 17 S/MMS	3,80	3,79	1
EVCYDEAC 21 S et MMS	6,45	6,40	1
EVCYDEAC 25 S & MMS	9,00	8,95	1
EVCYDEAC 29 S et MMS	12,10	12,05	1
EVCYDEAC 33 S & MMS	13,20	13,15	1

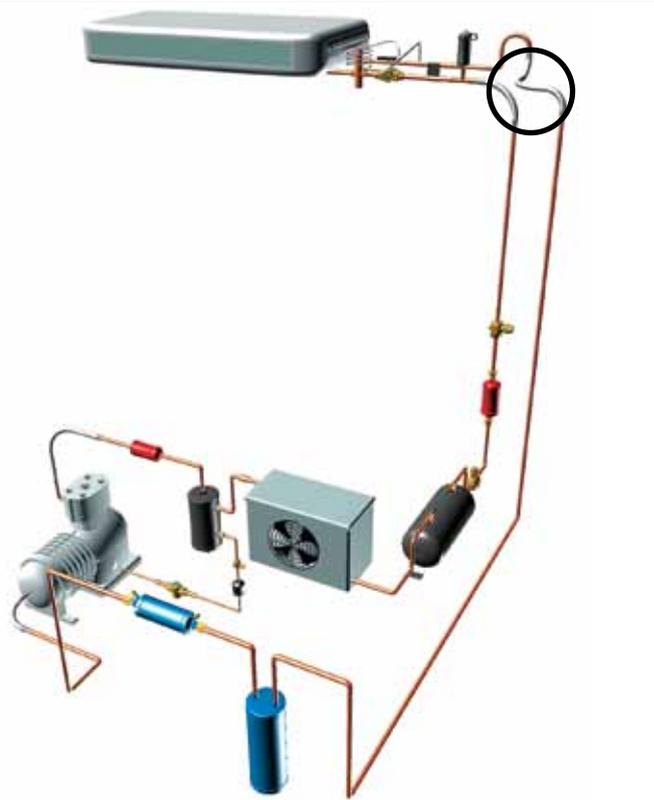
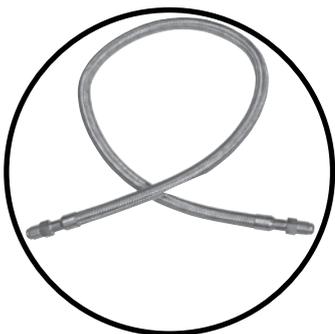


Stainless steel hoses, nickel-plated steel connections

→ TSCYS

■ Applications

- Flexible joining between fixed or mobile elements of refrigerating and air conditioning installations.
- Disconnection of installation's components, in order to eliminate all vibration transmissions.
- Elimination of stresses linked to dimensional piping variations (thermal expansion, retraction).
- Particularly recommended for:
 - Construction of mobile refrigerated display
 - Installations requiring the dismantling of removable parts in order to facilitate their cleaning
 - Any installation, refrigeration or air conditioning, which includes a mobile part
 - Replacement of the traditional copper piping in particular cases (operation of brazing difficult to make, search of time-saving, ...)



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- Flexible wavy stainless steel metallic hoses constituted of spiral waves from a tube welded end to end and covered with a stainless steel wire braid.
- Nickel-plated steel connections, for the standards models: to screw SAE and to solder ODF.
- Standard lengths: 1 metre, and 1.50 metre.
- Cleaning and drying before individual packaging under heat sealed plastic tubular film.

 **Possible customization on request, even for unit needs:**

- Specific lengths
- Stainless steel connections, for better resistance to corrosive environments (e.g. railway and maritime application, ...)
- Specific flanges or connections

■ CARLY advantages

- Maximal working pressure: 46 bar.
- Specifically designed in order to resist frost and major temperature shifts, from - 40 °C to + 140 °C.
- Principle for connecting the components together (stainless steel hose + air-tightness ring + braid + connection) by stainless steel TIG weld. Contrary to a braze, this weld eliminates all risks of deteriorating the flexible hose by heat transfer during connection to the installation's piping.
- Very high mechanical resistance to corrosion.
- Long brazed or welded connections, in order to facilitate connection to installation.
- Unity helium air-tightness inspection.
- GOST certified products.



Stainless steel hoses, nickel-plated steel connections

→ TSCYS

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to TSCYS stainless steel flexible hoses

- Mounting of hoses can be performed in any direction, but without twisting, over-bending, extension or axial compression stress.
- Respect the minimum radius of curvature (static and dynamic) indicated in the technical specifications table.
- The hoses must imperatively be protected against shocks, not be put directly on the ground, not lie on sharp edges and not be in contact with each other.
- In the case of a dynamic assembly, the direction of movement and the axis of

the hose should be located within a same plane.

- For the brazing operation, we recommend the use of a filler metal with a high silver content (38 %minimum) and the use of a neutral gas inside the hose in order to avoid internal corrosion phenomena.
- During the brazing operation, be careful that the scouring flux used does not come in contact with the hose and its braid.
- The nickel lining of the connections hold ready nicely during temperature increase; it is nevertheless recommended to protect

the connections after brazing with an appropriate product, against corrosion risks.

- Tightening of hoses with flare connections must imperatively be performed with two wrenches, in order to prevent piping twisting.
- All arrangements must be taken, in order to prevent water concentration that may freeze and then deteriorate the flexible hose.



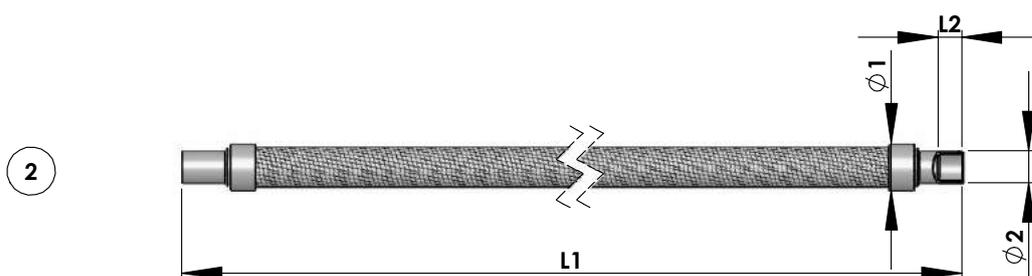
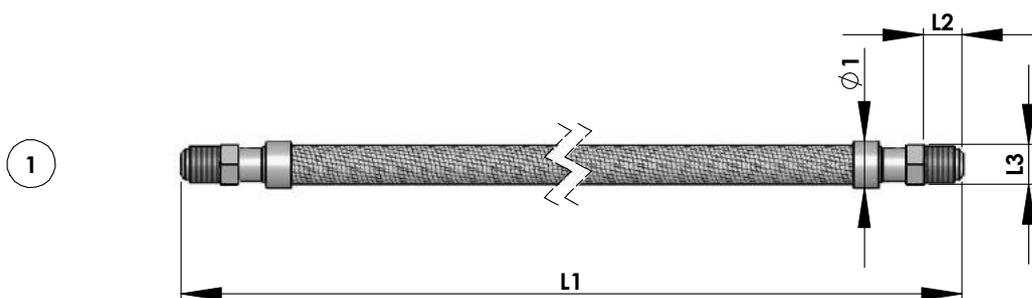
Stainless steel hoses, nickel-plated steel connections

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→ TSCYS

■ Technical features

CARLY references	Connections To screw SAE pouce	Connections To solder ODF pouce	CARLY references	Connections To solder ODF mm	Drawing No	Dimensions mm					Minimal bending radius mm	
						Ø1	Ø2	L1	L2	L3 upper faces	Static	Dynamic
TSCYS 1002	1/4				1	13	/	1000	15	14	20	105
TSCYS 1002 S		1/4	TSCYS 1002 MMS	6	2	13	9	1000	6	/	20	105
TSCYS 1003	3/8				1	18	/	1000	18	17	30	130
TSCYS 1003 S		3/8	TSCYS 1003 MMS	10	2	18	13	1000	9	/	30	130
TSCYS 1004	1/2				1	20	/	1000	20	22	40	150
TSCYS 1004 S		1/2	TSCYS 1004 MMS	12	2	20	16	1000	11	/	40	150
TSCYS 1005	5/8				1	26	/	1000	23	24	60	190
TSCYS 1005 S		5/8	TSCYS 1005 MMS	15	2	26	19	1000	14	/	60	190
TSCYS 1502	1/4				1	13	/	1500	15	14	20	105
TSCYS 1502 S		1/4	TSCYS 1502 MMS	6	2	13	9	1500	6	/	20	105
TSCYS 1503	3/8				1	18	/	1500	18	17	30	130
TSCYS 1503 S		3/8	TSCYS 1503 MMS	10	2	18	13	1500	9	/	30	130
TSCYS 1504	1/2				1	20	/	1500	20	22	40	150
TSCYS 1504 S		1/2	TSCYS 1504 MMS	12	2	20	16	1500	11	/	40	150
TSCYS 1505	5/8				1	26	/	1500	23	24	60	190
TSCYS 1505 S		5/8	TSCYS 1505 MMS	15	2	26	19	1500	14	/	60	190





Stainless steel hoses, nickel-plated steel connections

→ TSCYS

■ Technical features

CARLY references	Nominal diameter	CARLY references	Nominal diameter	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	DN inch		DN mm	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
TSCYS 1002	1/4			46	15	140	-40	-30	Art3§3
TSCYS 1002 S	1/4	TSCYS 1002 MMS	6	46	15	140	-40	-30	Art3§3
TSCYS 1003	3/8			46	15	140	-40	-30	Art3§3
TSCYS 1003 S	3/8	TSCYS 1003 MMS	10	46	15	140	-40	-30	Art3§3
TSCYS 1004	1/2			46	15	140	-40	-30	Art3§3
TSCYS 1004 S	1/2	TSCYS 1004 MMS	12	46	15	140	-40	-30	Art3§3
TSCYS 1005	5/8			46	15	140	-40	-30	Art3§3
TSCYS 1005 S	5/8	TSCYS 1005 MMS	15	46	15	140	-40	-30	Art3§3
TSCYS 1502	1/4			46	15	140	-40	-30	Art3§3
TSCYS 1502 S	1/4	TSCYS 1502 MMS	6	46	15	140	-40	-30	Art3§3
TSCYS 1503	3/8			46	15	140	-40	-30	Art3§3
TSCYS 1503 S	3/8	TSCYS 1503 MMS	10	46	15	140	-40	-30	Art3§3
TSCYS 1504	1/2			46	15	140	-40	-30	Art3§3
TSCYS 1504 S	1/2	TSCYS 1504 MMS	12	46	15	140	-40	-30	Art3§3
TSCYS 1505	5/8			46	15	140	-40	-30	Art3§3
TSCYS 1505 S	5/8	TSCYS 1505 MMS	15	46	15	140	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
TSCYS 1002	0,21	0,21	1	TSCYS 1502	0,29	0,29	1
TSCYS 1002 S & MMS	0,16	0,16	1	TSCYS 1502 S & MMS	0,25	0,25	1
TSCYS 1003	0,30	0,30	1	TSCYS 1503	0,39	0,39	1
TSCYS 1003 S & MMS	0,25	0,25	1	TSCYS 1503 S & MMS	0,34	0,34	1
TSCYS 1004	0,40	0,40	1	TSCYS 1504	0,56	0,56	1
TSCYS 1004 S & MMS	0,35	0,35	1	TSCYS 1504 S & MMS	0,45	0,45	1
TSCYS 1005	0,55	0,54	1	TSCYS 1505	0,72	0,71	1
TSCYS 1005 S & MMS	0,41	0,40	1	TSCYS 1505 S & MMS	0,40	0,39	1



Liquid receivers

→ RLHCY (horizontal) / RLVCY (vertical)

■ Applications

- - Liquid receivers ensure the compensation of refrigerant volume variations in refrigerating and air conditioning installations.
- These volume variations are due to fluctuations generated by various operating temperatures at various seasons, and to the opening and closing sequences of the expansion valve, which fills - or not - the evaporator with its refrigerant.
- Liquid receivers also allow storage of the whole installation's refrigerant, for maintenance or breakdown service.



■ Functional features

- Produits compatibles avec les CFC, HCFC, HFC, CO₂, ainsi qu'avec leurs huiles et additifs associés. Produits étudiés pour l'utilisation des fluides frigorigènes non dangereux du groupe 2 de la DESP 97/23/CE. Pour l'utilisation des composants CARLY avec des fluides du groupe 1 de type hydrocarbures - Propane R290, Butane R600, Isobutane R600a, Propylène R1270 - avec les HFO et le CO₂ transcritique et pour une application cycle organique de RANKINE - contacter le service technique CARLY.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- They have fasteners adapted to their volume and their weight.
- The receivers are supplied without valve (see paragraph "Spare parts" page 31.7)
- From the 9-litre model and on, receivers come with a 3/8" NPT boss for mounting of safety elements such as safety valves.



Customization possible on demand:

- Bi-flow receiver for applications such as heat pumps
- Dimensions, volumes, connections, pressure point for safety valve, support brackets
- Body and connections in stainless steel (better resistance to corrosion and to very low temperature).
- Bracket sets for compressors.

■ CARLY advantages

- Maximum working pressure from 42 to 46 bar.
- They offer both following connection possibilities :
 - Outside of the connections to screw.
 - Inside of the connections to braze.
- A wide range of accessories is available:
 - Rotalock stop valves, with connections to screw or to braze.
 - Rotalock connections with possibility of diameter reductions and with connections to braze.
- The liquid receiver are delivered perfectly clean deshydrated.
- GOST certified products.



Liquid receivers

→ RLHCY (horizontal) / RLVCY (vertical)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the liquid receivers RLHCY and RLVCY

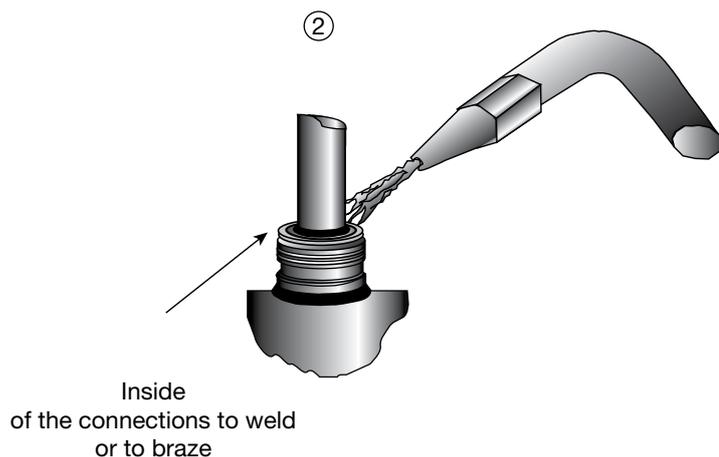
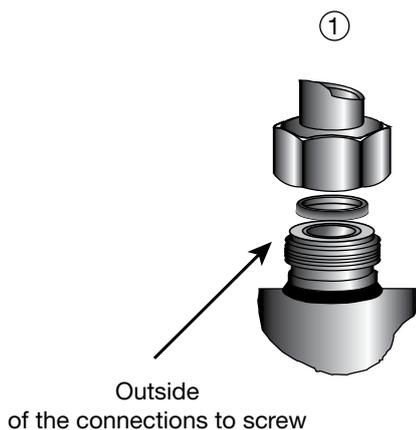
- Liquid receivers are to be mounted after the condenser
- For optimal operation, special attention should be paid to the receivers' level: RLHCY receivers should be perfectly horizontal and RLVCY should be perfectly vertical.
- Comply with the direction of the refrigerant flow; the inlet connection is tagged "IN"
- If sizing of the receivers is performed on the basis of the total refrigerant load, it is imperative to select receivers with an

internal volume 20 % bigger, so that the gas reserve is always above the liquid level.

- In case of an outside installation, it is recommended to protect the receiver against corrosion, low external temperatures and solar radiation.
- In accordance with the regulations, provide safety switch devices to limit the pressure.
- For operation with CO₂ at low temperature, provide additional insulation.

- The CARLY company declines any responsibility if any modifications, repairs are made by the user / buyer.

- The connections of the water cooled condensers CONDOR have an external screw thread (sketch 1) allowing the assembly of isolating valves or Rotalock connections, and an internal bore (sketch 2) allowing the brazing of a pipe.



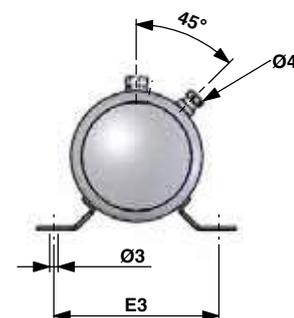
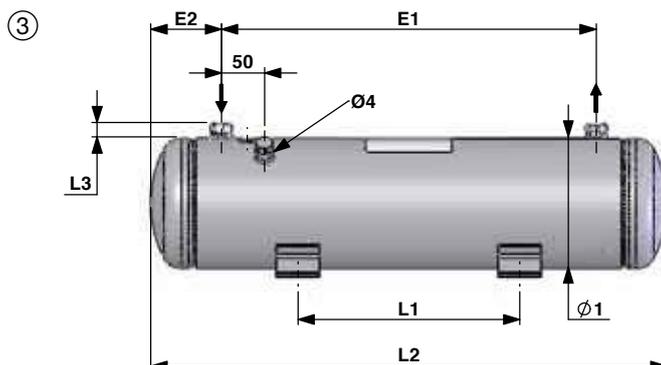
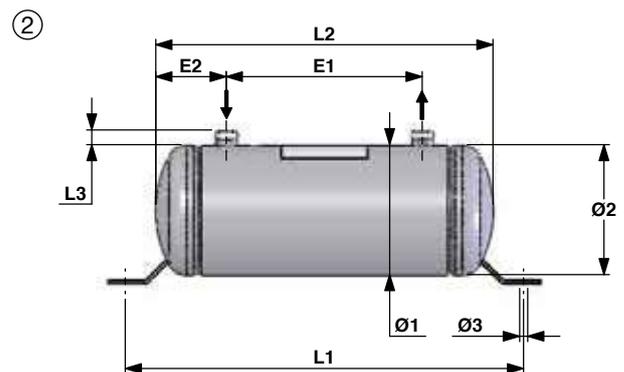
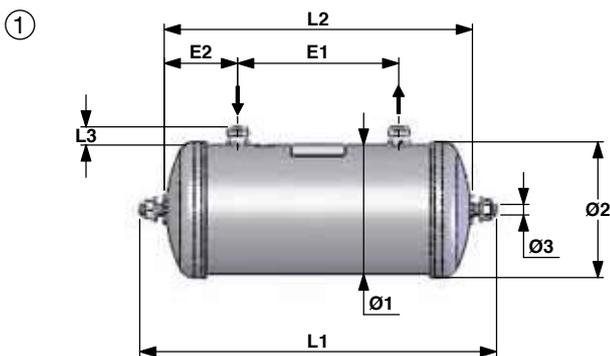


Liquid receivers

→ RLHCY (horizontal)

■ Technical features

CARLY references	Outside of connections to screw UNF inch	Inside of connections to solder inch	Drawing No	Dimensions mm									
				Ø1	Ø2	L1	L2	E1	E2	E2	Ø3	L3	Ø4 NPTF inch
RLHCY 15	3/4	1/4	1	88,9	95	343	298	210	44	/	M10	17,0	/
RLHCY 25	3/4	3/8	1	121,0	128	332	287	150	68	/	M10	17,0	/
RLHCY 30	3/4	3/8	1	121,0	128	368	323	186	68	/	M10	17,0	/
RLHCY 45	3/4	3/8	2	152,4	156	376	304	145	80	/	2 x Ø 10,5 x 9,5	17,0	/
RLHCY 60	1	1/2	2	152,4	156	459	387	228	80	/	2 x Ø 10,5 x 9,5	17,0	/
RLHCY 75	1	1/2	2	152,4	156	557	485	328	79	/	2 x Ø 10,5 x 9,5	17,0	/
RLHCY 90	1	1/2	3	152,4	156	258	595	436	80	192	4 x Ø 10,5 x 9,5	17,0	3/8
RLHCY 120	1 1/4	5/8	3	152,4	156	389	726	567	80	192	4 x Ø 10,5 x 9,5	22,5	3/8
RLHCY 150	1 1/4	3/4	3	168,3	172	352	748	582	83	200	4 x Ø 10,5 x 9,5	22,5	3/8
RLHCY 200	1 1/4	3/4	3	168,3	172	600	996	830	83	200	4 x Ø 10,5 x 9,5	22,5	3/8
RLHCY 250	1 1/4	3/4	3	168,3	172	750	1244	1078	83	200	4 x Ø 10,5 x 9,5	22,5	3/8
RLHCY 300	1 1/4	3/4	3	219,1	224	402	914	691	112	220	4 x Ø 10,5 x 9,5	22,5	3/8
RLHCY 400	1 3/4	1 1/8	3	219,1	224	690	1202	979	112	220	4 x Ø 10,5 x 9,5	22,5	1/2
RLHCY 500	1 3/4	1 1/8	3	219,1	224	800	1491	1268	112	220	4 x Ø 10,5 x 9,5	22,5	1/2
RLHCY 600	1 3/4	1 1/8	3	323,9	330	455	857	559	149	320	4 x Ø 10,5 x 9,5	22,5	1/2
RLHCY 700	1 3/4	1 1/8	3	323,9	330	605	1007	709	149	320	4 x Ø 10,5 x 9,5	22,5	1/2





Liquid receivers

→ RLHCY (horizontal)

■ Technical features

CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
RLHCY 15	1,6	46	15	100	-40	-30	I
RLHCY 25	2,8	46	15	100	-40	-30	I
RLHCY 30	3,1	46	15	100	-40	-30	I
RLHCY 45	4,4	45	15	100	-40	-30	I
RLHCY 60	6,0	46	15	100	-40	-30	II
RLHCY 75	7,6	46	15	100	-40	-30	II
RLHCY 90	9,1	46	15	100	-40	-30	II
RLHCY 120	11,4	46	15	100	-40	-30	II
RLHCY 150	15,0	46	15	100	-40	-30	II
RLHCY 200	20,0	46	15	100	-40	-30	II
RLHCY 250	25,0	46	15	100	-40	-30	III
RLHCY 300	30,0	45	15	100	-40	-30	III
RLHCY 400	40,0	45	15	100	-40	-30	III
RLHCY 500	50,0	45	15	100	-40	-30	III
RLHCY 600	60,0	42	15	100	-40	-30	III
RLHCY 700	70,0	42	15	100	-40	-30	III

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

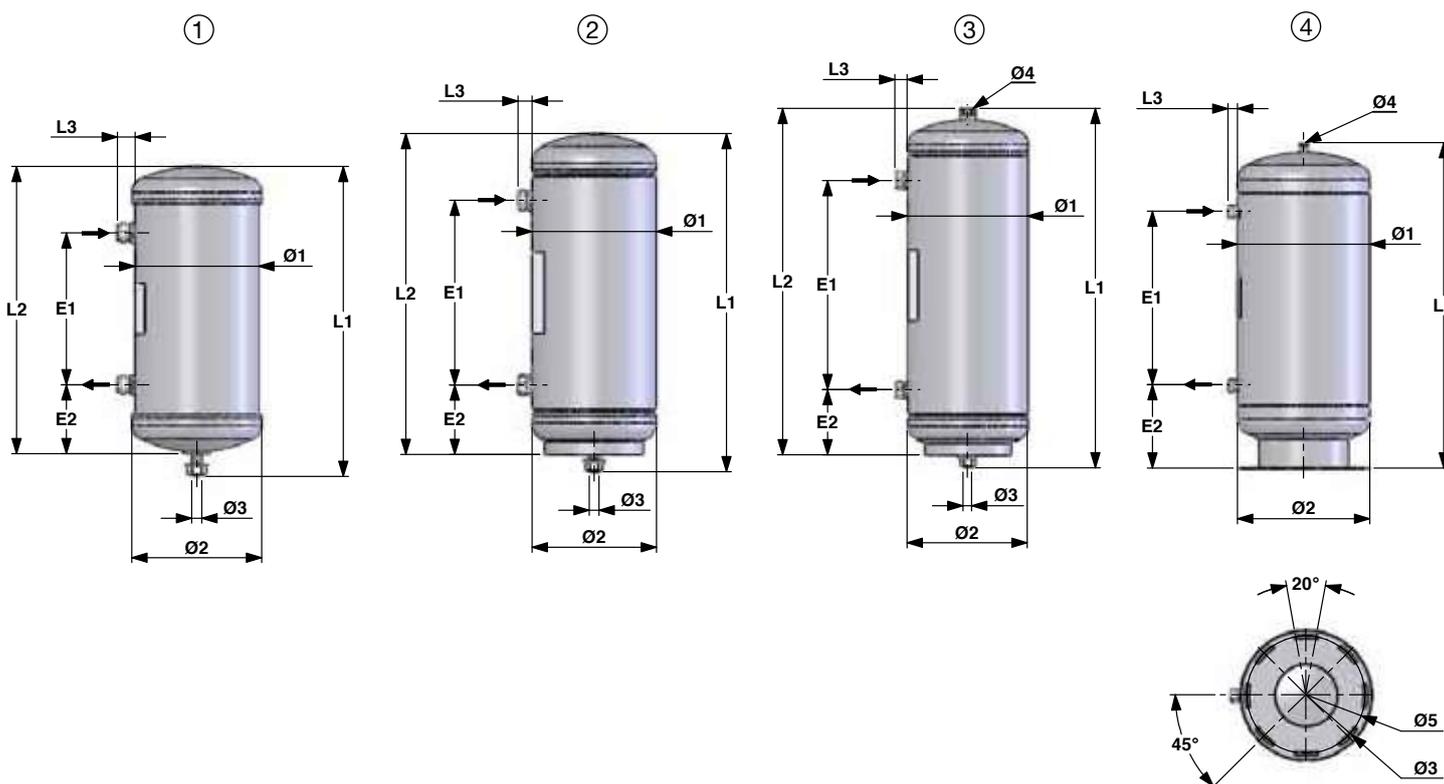


Liquid receivers

→ RLV CY (vertical)

■ Technical features

CARLY references	Outside of connections to screw UNF inch	Inside of connections to solder inch	Drawing No	Dimensions mm									
				Ø1	Ø2	L1	L2	E1	E2	Ø5	Ø3	L3	Ø4 NPTF inch
RLVCY 09	3/4	1/4	1	88,9	95	218	195	110	44	/	M10	17,0	/
RLVCY 15	3/4	1/4	1	88,9	95	318	295	210	44	/	M10	17,0	/
RLVCY 20	3/4	1/4	1	101,6	109	286	264	140	63	/	M10	17,0	/
RLVCY 25	3/4	3/8	1	121,0	128	306	284	150	68	/	M10	17,0	/
RLVCY 30	3/4	3/8	1	121,0	128	342	320	186	68	/	M10	17,0	/
RLVCY 40	3/4	3/8	1	121,0	128	442	420	286	68	/	M10	17,0	/
RLVCY 45	3/4	3/8	2	152,4	156	329	308	145	83	/	M12	17,0	/
RLVCY 60	1	1/2	2	152,4	156	412	391	228	83	/	M12	17,0	/
RLVCY 75	1	1/2	2	152,4	156	510	489	328	82	/	M12	17,0	/
RLVCY 90	1	1/2	3	168,3	172	507	487	295	89	/	M12	17,0	3/8
RLVCY 120	1 1/4	5/8	3	168,3	172	622	603	410	89	/	M12	22,5	3/8
RLVCY 150	1 1/4	3/4	4	219,1	224	569	/	280	154	190	8 x Ø 10,2	22,5	3/8
RLVCY 200	1 1/4	3/4	4	219,1	224	719	/	430	154	190	8 x Ø 10,2	22,5	3/8
RLVCY 250	1 1/4	3/4	4	219,1	224	836	/	547	154	190	8 x Ø 10,2	22,5	3/8
RLVCY 300	1 1/4	3/4	4	323,9	330	534	/	160	205	290	8 x Ø 10,2 x 50	22,5	3/8
RLVCY 400	1 3/4	1 1/8	4	323,9	330	670	/	296	205	290	8 x Ø 10,2 x 50	22,5	1/2
RLVCY 500	1 3/4	1 1/8	4	323,9	330	802	/	428	205	290	8 x Ø 10,2 x 50	22,5	1/2
RLVCY 600	1 3/4	1 1/8	4	323,9	330	934	/	560	205	290	8 x Ø 10,2 x 50	22,5	1/2
RLVCY 700	1 3/4	1 1/8	4	323,9	330	1084	/	709	206	290	8 x Ø 10,2 x 50	22,5	1/2





Liquid receivers

→ RLVCY (vertical)

■ Technical features

CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
RLVCY 09	1,0	46	15	100	-40	-30	Art3§3
RLVCY 15	1,6	46	15	100	-40	-30	I
RLVCY 20	1,8	46	15	100	-40	-30	I
RLVCY 25	2,8	46	15	100	-40	-30	I
RLVCY 30	3,1	46	15	100	-40	-30	I
RLVCY 40	4,2	46	15	100	-40	-30	I
RLVCY 45	4,4	45	15	100	-40	-30	I
RLVCY 60	6,0	46	15	100	-40	-30	II
RLVCY 75	7,6	46	15	100	-40	-30	II
RLVCY 90	9,2	46	15	100	-40	-30	II
RLVCY 120	11,5	46	15	100	-40	-30	II
RLVCY 150	15,7	45	15	100	-40	-30	II
RLVCY 200	20,9	45	15	100	-40	-30	II
RLVCY 250	25,0	45	15	100	-40	-30	III
RLVCY 300	29,6	42	15	100	-40	-30	III
RLVCY 400	40,0	42	15	100	-40	-30	III
RLVCY 500	50,0	42	15	100	-40	-30	III
RLVCY 600	60,0	42	15	100	-40	-30	III
RLVCY 700	70,0	42	15	100	-40	-30	III

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

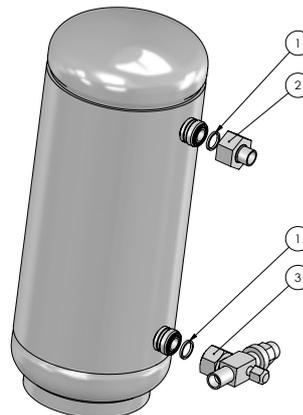
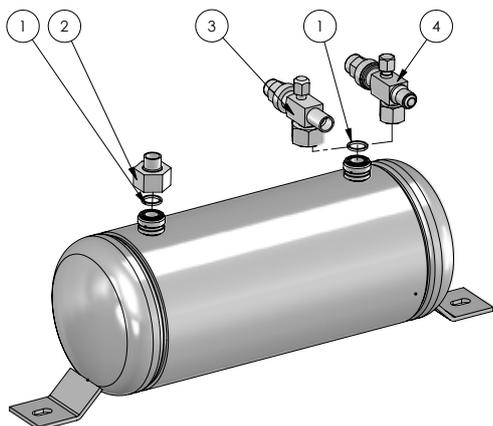
⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).



Liquid receivers

→ RLHCY (horizontal) / RLVCY (vertical)

■ Spare parts



RLHCY / RLVCY	CARLY references	Part N°	Gasket for ROTALOCK connections and valves inch
09 --> 45	CY 15580100	1	3/4
120 --> 300	CY 15580120	1	1 1/4
400 --> 700 < 03/2014	CY 15580120	1	1 1/4
60 --> 90	CY 15580140	1	1
400 --> 700 > 04/2014	CY 15580160	1	1 3/4



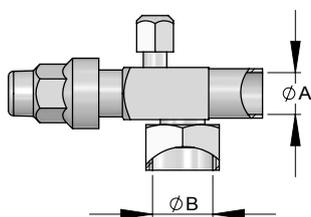
RLHCY / RLVCY	CARLY references	Part N°	ROTALOCK connection	
			ØA outlet ODF connection inch	ØB fixing UNF connector inch
09 --> 45	CY 17400000	2	1/4	3/4
09 --> 45	CY 17400010	2	3/8	3/4
60 --> 90	CY 17400020	2	1/2	1
120 --> 300	CY 17400035	2	5/8	1 1/4
400 --> 700 < 03/2014	CY 17400035	2	5/8	1 1/4
120 --> 300	CY 17400040	2	7/8	1 1/4
400 --> 700 < 03/2014	CY 17400040	2	7/8	1 1/4
120 --> 300	CY 17400050	2	1 1/8	1 1/4
400 --> 700 < 03/2014	CY 17400050	2	1 1/8	1 1/4
400 --> 700 > 04/2014	CY 17400055	2	7/8	1 3/4
400 --> 700 > 04/2014	CY 17400060	2	1 1/8	1 3/4
400 --> 700 > 04/2014	CY 17400065	2	1 3/8	1 3/4



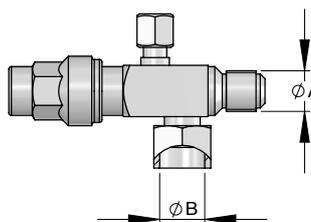
Liquid receivers

→ RLHCY (horizontal) / RLVCY (vertical)

■ Spare parts



RLHCY / RLVCY	CARLY references	Part N°	ROTALOCK valve with connection to solder	
			ØA outlet ODF valve inch	ØB fixing UNF valve inch
09 --> 45	CY 19700080	3	1/4	3/4
09 --> 45	CY 19700110	3	3/8	3/4
60 --> 90	CY 19700120	3	1/2	1
60 --> 90	CY 19700130	3	5/8	1
120 --> 300	CY 19700135	3	5/8	1 1/4
400 --> 700 < 03/2014	CY 19700135	3	5/8	1 1/4
120 --> 300	CY 19700160	3	7/8	1 1/4
400 --> 700 < 03/2014	CY 19700160	3	7/8	1 1/4
120 --> 300	CY 19700170	3	1 1/8	1 1/4
400 --> 700 < 03/2014	CY 19700170	3	1 1/8	1 1/4
400 --> 700 > 04/2014	CY 19700175	3	7/8	1 3/4
400 --> 700 > 04/2014	CY 19700180	3	1 1/8	1 3/4
400 --> 700 > 04/2014	CY 19700185	3	1 3/8	1 3/4



RLHCY / RLVCY	CARLY references	Part N°	ROTALOCK valve with connection to screw	
			ØA outlet SAE valve pouce	ØB fixing UNF valve pouce
09 --> 45	CY 19700090	4	1/4	3/4
09 --> 45	CY 19700100	4	3/8	3/4
60 --> 90	CY 19700140	4	1/2	1



Liquid receivers

➔ RLHCY (horizontal) / RLVCY (vertical)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
RLHCY 15	1,90	1,55	1
RLHCY 25	3,41	3,11	1
RLHCY 30	3,86	3,56	1
RLHCY 45	5,95	5,55	1
RLHCY 60	7,40	6,80	1
RLHCY 75	8,73	8,13	1
RLHCY 90	10,00	9,40	1
RLHCY 120	12,40	11,80	1
RLHCY 150	16,60	16,00	1
RLHCY 200	20,60	20,00	1
RLHCY 250	25,20	23,00	1
RLHCY 300	31,74	29,54	1
RLHCY 400	39,94	37,74	1
RLHCY 500	47,90	45,70	1
RLHCY 600	57,70	55,50	1
RLHCY 700	63,60	62,40	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
RLVCY 09	1,50	1,10	1
RLVCY 15	2,15	1,75	1
RLVCY 20	2,87	2,47	1
RLVCY 25	3,36	3,11	1
RLVCY 30	3,51	3,16	1
RLVCY 40	4,36	4,26	1
RLVCY 45	5,85	5,55	1
RLVCY 60	7,10	6,80	1
RLVCY 75	8,48	8,13	1
RLVCY 90	10,35	10,00	1
RLVCY 120	10,60	10,10	1
RLVCY 150	19,65	19,15	1
RLVCY 200	24,27	23,67	1
RLVCY 250	28,92	28,32	1
RLVCY 300	34,80	34,00	1
RLVCY 400	42,10	41,30	1
RLVCY 500	50,60	49,40	1
RLVCY 600	57,20	56,00	1
RLVCY 700	64,70	63,50	1

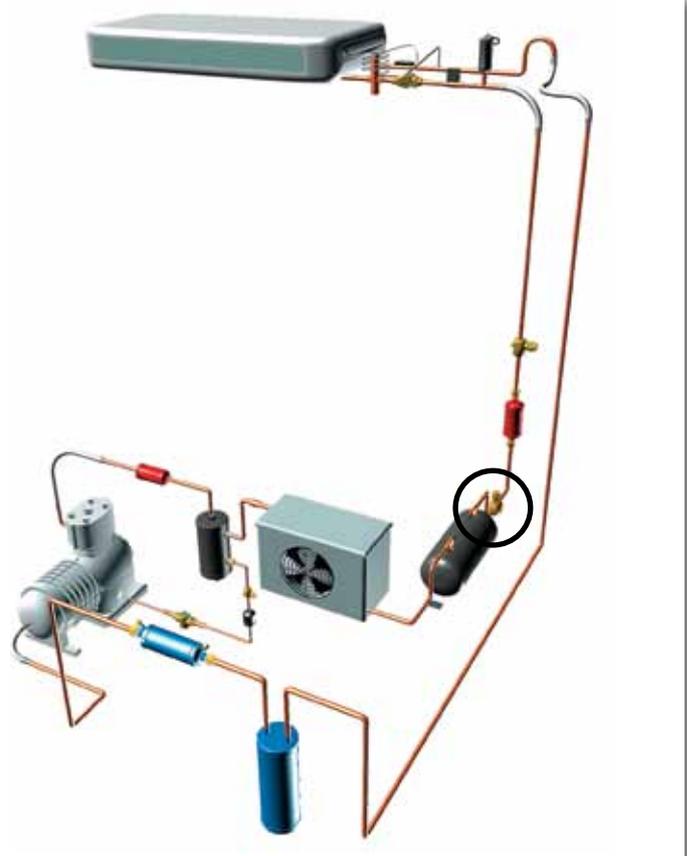


Receiver sight glasses

→ VCYR / VCYR-W

■ Applications

- Immediate and direct monitoring of levels of refrigerant in its liquid phase or of refrigerating oil, in refrigerating and air conditioning installations.
- In addition, the VCYR-W allows the monitoring of the moisture content in the refrigerant.
- These level sight glasses are to be positioned directly on the receivers' body or on the piping.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- The sight glass is made of four parts:
 - a steel base intended to be directly welded on a bracket after drilling.
 - a glass screwed on the base.
 - a PTFE O-ring gasket ensuring air-tightness between the base and the glass.
 - a coloured ball ensures a correct liquid level visualisation inside the component on which the sight glass is positioned.
- Model VCYR-W 32 : include a glass with a moisture indicator resistant to acids.

■ CARLY advantages

- Maximum working pressure: 46 bar
- The large size of the glass ensures an excellent visibility of refrigerant.
- Saves space, material and assembly time, compared to the installation of a sight glass mounted in series with the refrigerating piping.
- The nickel-plated steel base and the dichromated zinc-plated steel glass guarantee perfect resistance to corrosion.
- The glass is cast in metal; therefore it eliminates risks of leak.
- GOST certified products.



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Receiver sight glasses

→ VCYR / VCYR-W

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the receiver sight glass VCYR

- The glass and the O-ring gasket should be removed during the welding of the base on the bracket.

- After this welding and when the base temperature is low enough, put the

O-ring seal back into its compartment and screw the glass back complying with the recommended tightening torque of 25 N.m.

- The O-ring seal (CARLY reference

CY15552180) must be replaced after each removal of the glass.

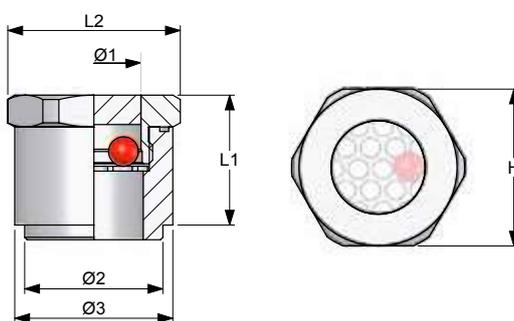


Receiver sight glasses

→ VCYR / VCYR-W

■ Technical features

CARLY references	Dimensions mm					
	L1	L2	H upper faces	Ø1	Ø2	Ø3
VCYR 32	27	35	32	19	28	32
VCYR-W 32	27	35	32	19	28	32



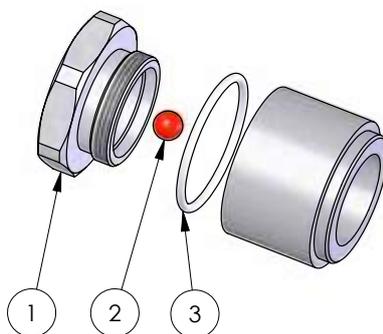
CARLY references	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
VCYR 32	46	15	120	-40	-30	Art3§3
VCYR-W 32	46	15	120	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Accessories, according to PED 97/23/EC (refer to chapter 0).

■ Spare parts

CARLY references		Part N°	Description	Quantity
Receiver sight glass	Spare parts			
VCYR 32	CY 35012150	1	Glass without moisture indicator, gasket included	1
VCYR-W 32	CY 35012140	1	Glass with moisture indicator, gasket included	1
VCYR 32	CY 10501000	2	Colour ball for sight glass	1
VCYR-W 32				
VCYR 32	CY 15552180	3	O-ring PTFE gasket for sight glass	1
VCYR-W 32				





CTCY-GB – 32.1-3 / 01-2013

Receiver sight glasses

→ VCYR / VCYR-W

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
VCYR 32	0,10	0,10	1
VCYR-W 32	0,10	0,10	1

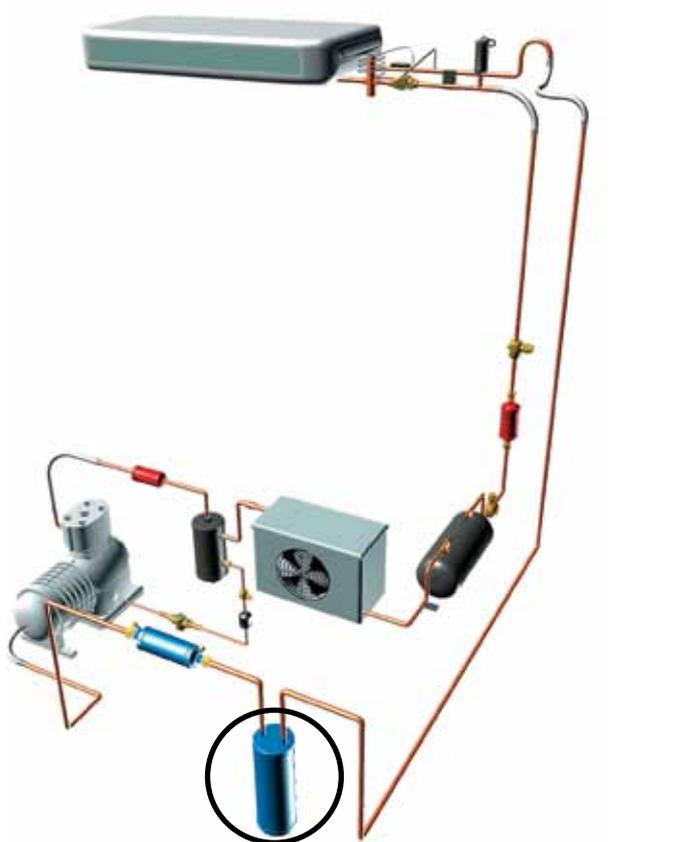
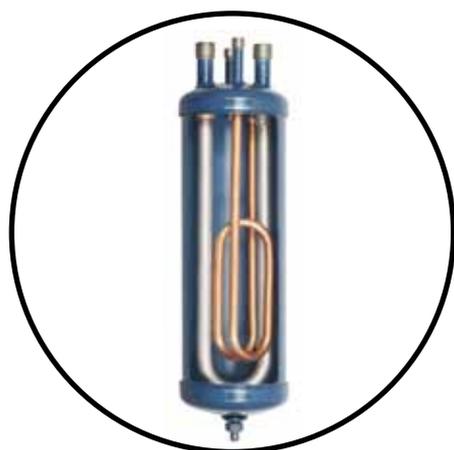


Suction line accumulators

➔ **LCY** (without heat exchanger) / **LCYE** (with heat exchanger) / **LCY-ST** (stainless steel without heat exchanger)

■ Applications

- Elimination of risks linked to the return of refrigerant in its liquid phase and to the massive oil intake at compressor's suction of refrigerating and air conditioning installations.
- The suction line accumulators LCY and LCYE are particularly recommended for installations that are:
 - ➔ exposed to sudden thermal load variations,
 - ➔ whose piping lengths are important,
 - ➔ operating with cycle inversions.
- The LCYE suction accumulators with heat exchanger are particularly recommended:
 - ➔ For installations with a low overheating of refrigerant vapours at compressor suction (liquid cooler, low temperature display cabinets, vehicle refrigerating, etc ...).
 - ➔ For installations where the suction line accumulator is positioned outside (in this case, the exchanger allows a faster reevaporation of the liquid).



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- LCY and LCYE suction line accumulators are designed to ensure optimal separation between the vapour phase and the liquid phase of the refrigerant; only the vapour phase is aspirated by the compressor.
- Reduction of the low pressure circuit vibrations.
- **LCY-ST** : Body and connections in stainless steel 316L (better resistance to corrosion and to very low temperature).

🧑‍🔧 Possible customization on demand:

- Specifics volumes and connections,
- Different supports and dimensions.

■ CARLY advantages

- Maximum working pressure: up to 46 bar.
- The pressure drops are low and never go over 0.3°C.
- The heat exchanger allows the increase of the refrigerant's refrigerating effect, by high pressure liquid sub-refrigerating, upstream of the pressure relief valve; it therefore prevents the risks of gas presence at the intake of the pressure relief valve.
- A hole on the lower part of the inner rod ensures liquid expansion and return to the compressor of the oil that could be trapped inside the suction line accumulator.
- From models LCY(E) 1517 S/MMS, presence of a connection on the low part for an oil return by gravity.
- A very large range of suction line accumulators is available, from 0.9 to 70 litres.
- GOST certified products.



Suction line accumulators

→ **LCY** (*without heat exchanger*) / **LCYE** (*with heat exchanger*) / **LCY-ST** (*stainless steel without heat exchanger*)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the suction line accumulators LCY / LCYE

- The capacity of the selected accumulator (Kg of fluid) must be higher than 50% of the total load in refrigerant of the installation.
- Mounting should be exclusively performed in vertical position, as close as possible to the compressor and at the same height.
- In order to avoid the freezing of the accumulators, it is advised to thematically insulate them.
- For optimal operation, the refrigerant flow speed in the suction line accumulators rods should be between 8 and 12 m/s; for lower speed values, the oil return to the compressor is unsure.
- The LCYE suction line accumulators' heat exchanger should be connected in series with the liquid line, between the installation's receiver and pressure relief valve.
- Imperative input through the connection marked "IN".
- For the model LCYE, the two connections of the exchanger can be used as input indifferently.
- The CARLY company declines any responsibility if any modifications, repairs are made by the user / buyer.



Suction line accumulators

→ **LCY** (*without heat exchanger*) / **LCYE** (*with heat exchanger*) / **LCY-ST** (*stainless steel without heat exchanger*)

■ SELECTION OF A CARLY (LCY/LCYE) SUCTION LINE ACCUMULATOR

- 1 • The capacity of the installation should not be higher than the maximum acceptable capacity of the selected accumulator.
- 2 • The oil return is ensured when the capacity of the installation is not lower than the minimum acceptable capacity of the selected accumulator.

LCY/LCYE MODEL SELECTION USING THE INSTALLATION'S REFRIGERATING CAPACITY

- *"MAXIMUM refrigerating capacity" selection curves, according to the refrigerant used*

Carry forward on the curve the installation's refrigerating capacity and the evaporation temperature: if the operating point is between 2 curves: take the higher curve.

- *"MINIMUM refrigerating capacity" selection curves, according to the refrigerant used*

Carry forward on the curve the installation's refrigerating capacity and the evaporation temperature: the operating point should be above the curve of the accumulator selected. If this is not the case, choose a smaller accumulator.

LCY/LCYE VOLUME SELECTION USING THE INSTALLATION'S REFRIGERANT LOAD

- *Selection tables*

The capacity of the selected accumulator in kg of refrigerant at 30 °C must be higher than half the installation's total refrigerant load (except CO₂).



Suction line accumulators

→ **LCY** (without heat exchanger) / **LCYE** (with heat exchanger) / **LCY-ST** (stainless steel without heat exchanger)

■ Example of selection of a LCY suction line accumulator without heat exchanger

The sizing of a product implies for the buyer to take into account the conditions under which the product will be used (temperature - pressure - refrigerant - oil - external environment). The values of the selection tables proposed in the CARLY catalogue match accurate test conditions.

- Installation operating with R404A under the following conditions⁽¹⁾:
 - $T_0 = -10\text{ °C}$
 - $T_k = 30\text{ °C}$
 - $Q_{Ox} = 8\text{ kW}$
 - Capacity of refrigerant at 30 °C of the circuit = 5 kg
 - Suction piping = 7/8"
- Which LCY suction line accumulator to choose?

LCY MODEL SELECTION USING THE INSTALLATION'S REFRIGERATING CAPACITY

- "MAXIMUM refrigerating capacity" selection curves according to the refrigerant used

Selection curves for R 404A

$Q_{Ox} = 8\text{ kW}$

$T_0 = -10\text{ °C}$

Result:

LCY 27 S/MMS or LCY 47 S/MMS

- "MINIMUM refrigerating capacity" selection curves according to the refrigerant used

Selection curves for R 404A

Range chosen: LCY 27 S/MMS or LCY 47 S/MMS

Result:

Minimum power: 2 kW lower than 8 kW → The selection is correct

LCY VOLUME SELECTION USING THE INSTALLATION'S REFRIGERANT LOAD

- Selection table

→ Refrigerant capacity of the refrigerating circuit: 5 kg

Half the load represents: $5/2 = 2,5\text{ kg}$

LCY 27 S/MMS : 1,8 kg LCY 47 S/MMS : 2,6 kg

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Capacity of accumulator kg of refrigerant at 30 °C		
				R134a R407C R22 - R407F	R404A R410A R507	R744
LCY 27 S/MMS	7/8	LCY 27 S/MMS	22	2,0	1,7	1,1
LCY 47 S/MMS	7/8	LCY 47 S/MMS	22	2,8	2,4	1,5

Result:

Among the 2 pre-selected references, the LCY 47 S/MMS accumulator should be selected because its capacity in kg of refrigerant (2.6 kg) is higher than half the installation's total refrigerant load (2.5 kg).

⁽¹⁾ Chapter "Abbreviations and units" (refer to chapter 113).

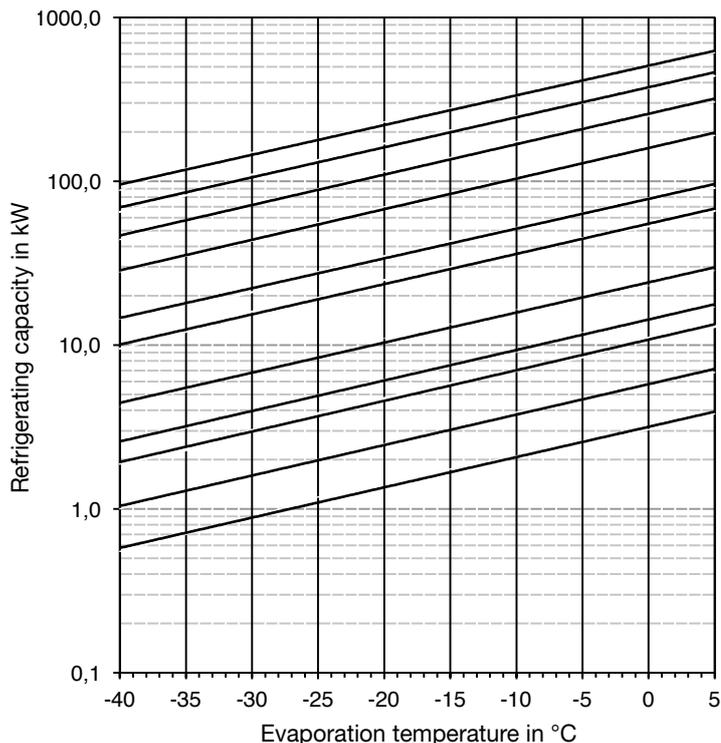


Suction line accumulators

➔ **LCY** (without heat exchanger) / **LCYE** (with heat exchanger) / **LCY-ST** (stainless steel without heat exchanger)

■ Selection curves for R22 - R404A - R507 - R407C - R410A - R407F

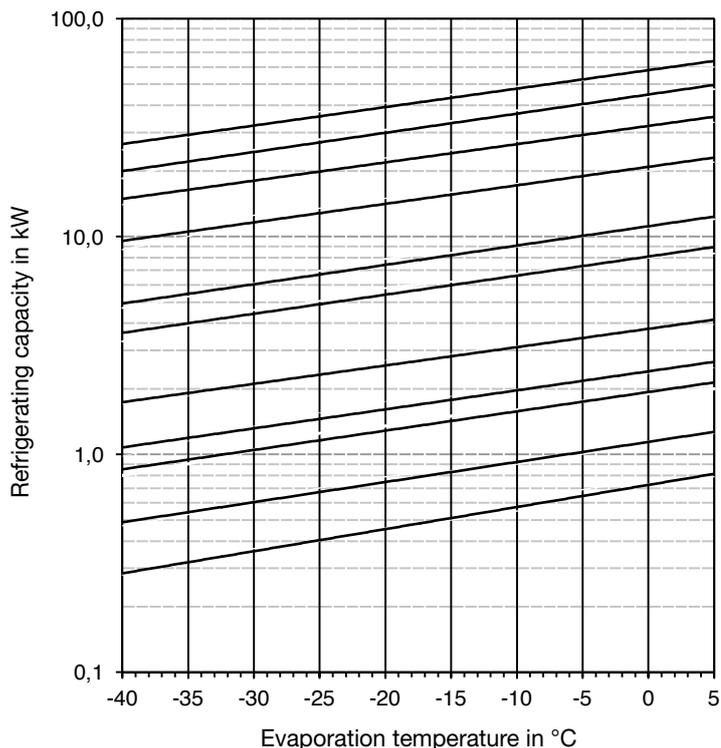
MAXIMAL REFRIGERATING CAPACITY



CARLY REFERENCES

- LCY 7029
- LCY 3625 - LCY 5025 - LCY 7025 - LCYE 3625
- LCY 3621 - LCY 5021 - LCYE 3621
- LCY 1517 - LCY 1817 - LCY 3617 - LCYE 1517
- LCY 813 - LCY 1013 - LCYE 1013 - LCY-ST 1013
- LCY 611 - LCY 811 - LCY 1011 - LCYE 811 - LCY-ST 1011
- LCY49 - LCY 69 - LCY 89 - LCYE 69 - LCY-ST 89
- LCY 27 - LCY 47 - LCYE 47
- LCY 16 - LCY 26 - LCYE 26
- LCY 15 - LCY 25 - LCYE 25
- LCY 04 - LCY 14

MINIMAL REFRIGERATING CAPACITY



CARLY REFERENCES

- LCY 7029
- LCY 3625 - LCY 5025 - LCY 7025 - LCYE 3625
- LCY 3621 - LCY 5021 - LCYE 3621
- LCY 1517 - LCY 1817 - LCY 3617 - LCYE 1517
- LCY 813 - LCY 1013 - LCYE 1013 - LCY-ST 1013
- LCY 611 - LCY 811 - LCY 1011 - LCYE 811 - LCY-ST 1011
- LCY49 - LCY 69 - LCY 89 - LCYE 69 - LCY-ST 89
- LCY 27 - LCY 47 - LCYE 47
- LCY 16 - LCY 26 - LCYE 26
- LCY 15 - LCY 25 - LCYE 25
- LCY 04 - LCY 14

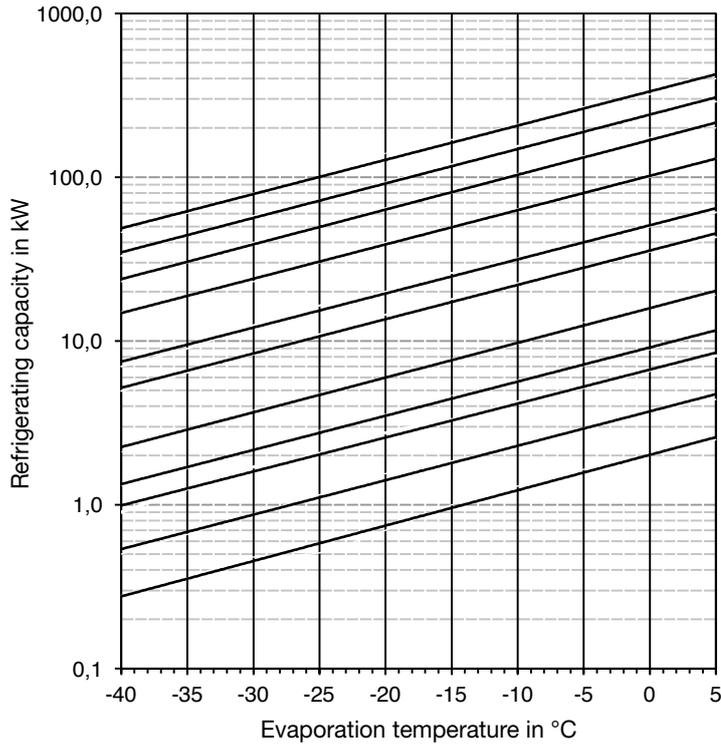


Suction line accumulators

➔ **LCY** (without heat exchanger) / **LCYE** (with heat exchanger) / **LCY-ST** (stainless steel without heat exchanger)

■ Selection curves for R314a

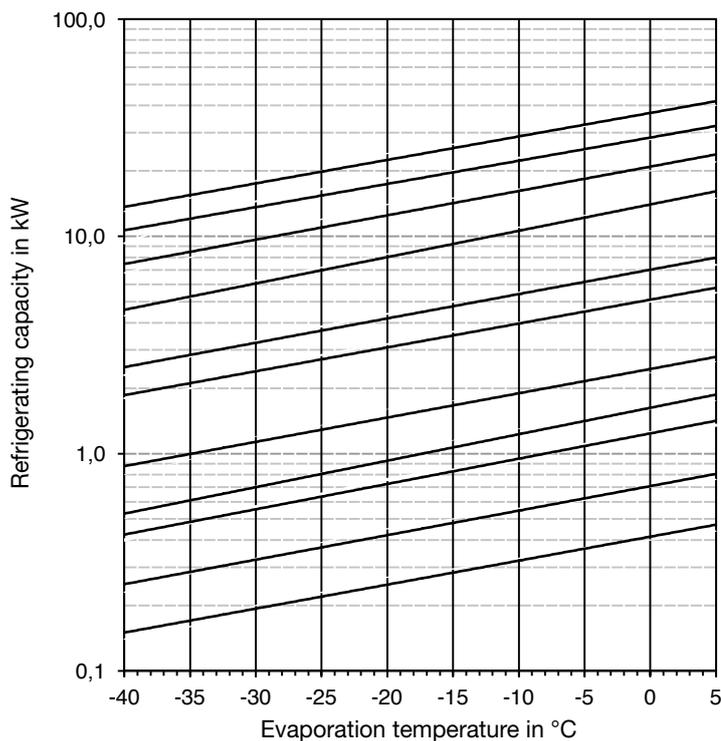
MAXIMAL REFRIGERATING CAPACITY



CARLY REFERENCES

- LCY 7029
- LCY 3625 - LCY 5025 - LCY 7025 - LCYE 3625
- LCY 3621 - LCY 5021 - LCYE 3621
- LCY 1517 - LCY 1817 - LCY 3617 - LCYE 1517
- LCY 813 - LCY 1013 - LCYE 1013 - LCY-ST 1013
- LCY 611 - LCY 811 - LCY 1011 - LCYE 811 - LCY-ST 1011
- LCY49 - LCY 69 - LCY 89 - LCYE 69 - LCY-ST 89
- LCY 27 - LCY 47 - LCYE 47
- LCY 16 - LCY 26 - LCYE 26
- LCY 15 - LCY 25 - LCYE 25
- LCY 04 - LCY 14

MINIMAL REFRIGERATING CAPACITY



CARLY REFERENCES

- LCY 7029
- LCY 3625 - LCY 5025 - LCY 7025 - LCYE 3625
- LCY 3621 - LCY 5021 - LCYE 3621
- LCY 1517 - LCY 1817 - LCY 3617 - LCYE 1517
- LCY 813 - LCY 1013 - LCYE 1013 - LCY-ST 1013
- LCY 611 - LCY 811 - LCY 1011 - LCYE 811 - LCY-ST 1011
- LCY49 - LCY 69 - LCY 89 - LCYE 69 - LCY-ST 89
- LCY 27 - LCY 47 - LCYE 47
- LCY 16 - LCY 26 - LCYE 26
- LCY 15 - LCY 25 - LCYE 25
- LCY 04 - LCY 14

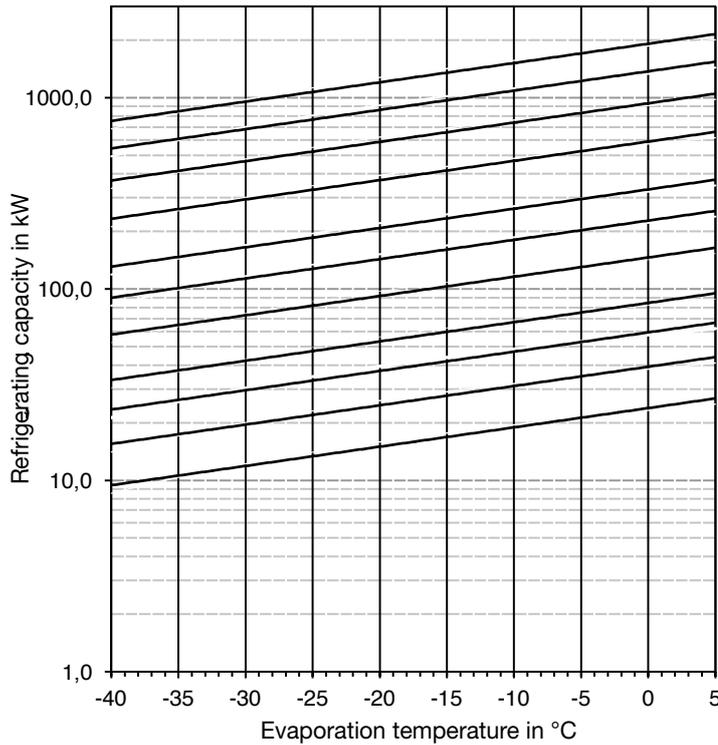


Suction line accumulators

➔ **LCY** (without heat exchanger) / **LCYE** (with heat exchanger) / **LCY-ST** (stainless steel without heat exchanger)

■ Selection curves for R744 (CO₂)

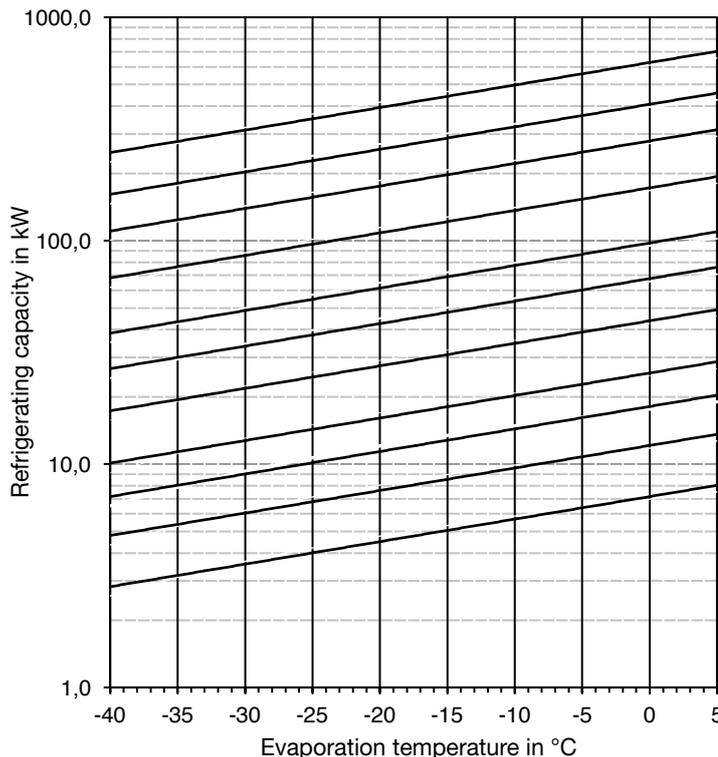
MAXIMAL REFRIGERATING CAPACITY



CARLY REFERENCES

- LCY 7029
- LCY 3625 - LCY 5025 - LCY 7025 - LCYE 3625
- LCY 3621 - LCY 5021 - LCYE 3621
- LCY 1517 - LCY 1817 - LCY 3617 - LCYE 1517
- LCY 813 - LCY 1013 - LCYE 1013 - LCY-ST 1013
- LCY 611 - LCY 811 - LCY 1011 - LCYE 811 - LCY-ST 1011
- LCY49 - LCY 69 - LCY 89 - LCYE 69 - LCY-ST 89
- LCY 27 - LCY 47 - LCYE 47
- LCY 16 - LCY 26 - LCYE 26
- LCY 15 - LCY 25 - LCYE 25
- LCY 04 - LCY 14

MINIMAL REFRIGERATING CAPACITY



CARLY REFERENCES

- LCY 7029
- LCY 3625 - LCY 5025 - LCY 7025 - LCYE 3625
- LCY 3621 - LCY 5021 - LCYE 3621
- LCY 1517 - LCY 1817 - LCY 3617 - LCYE 1517
- LCY 813 - LCY 1013 - LCYE 1013 - LCY-ST 1013
- LCY 611 - LCY 811 - LCY 1011 - LCYE 811 - LCY-ST 1011
- LCY49 - LCY 69 - LCY 89 - LCYE 69 - LCY-ST 89
- LCY 27 - LCY 47 - LCYE 47
- LCY 16 - LCY 26 - LCYE 26
- LCY 15 - LCY 25 - LCYE 25
- LCY 04 - LCY 14



Suction line accumulators

➔ **LCY** (without heat exchanger) / **LCY-ST** (stainless steel without heat exchanger)

■ Selection table

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Capacity of accumulator kg of refrigerant at 30 °C		
				R134a R407C R22- R407F	R404A R410A R507	R744
LCY 04 S	1/2	LCY 04 MMS	12	0,8	0,7	0,4
LCY 14 S	1/2	LCY 14 MMS	12	1,4	1,2	0,7
LCY 15 S/MMS	5/8	LCY 15 S/MMS	16	1,3	1,1	0,7
LCY 16 S	3/4	LCY 16 MMS	18	1,3	1,1	0,7
LCY 25 S/MMS	5/8	LCY 25 S/MMS	16	2,1	1,8	1,1
LCY 26 S	3/4	LCY 26 MMS	18	2,1	1,8	1,1
LCY 27 S/MMS	7/8	LCY 27 S/MMS	22	2,0	1,7	1,1
LCY 47 S/MMS	7/8	LCY 47 S/MMS	22	2,8	2,4	1,5
LCY 49 S	1 1/8	LCY 49 MMS	28	3,6	3,1	1,9
LCY 69 S	1 1/8	LCY 69 MMS	28	4,8	4,1	2,6
LCY 89 S	1 1/8	LCY 89 MMS	28	6,6	5,6	3,5
LCY 611 S/MMS	1 3/8	LCY 611 S/MMS	35	4,6	3,9	2,4
LCY 811 S/MMS	1 3/8	LCY 811 S/MMS	35	6,2	5,3	3,3
LCY 813 S	1 5/8	LCY 813 MMS	42	5,9	5,1	3,1
LCY 1011 S/MMS	1 3/8	LCY 1011 S/MMS	35	8,1	6,9	4,3
LCY 1013 S	1 5/8	LCY 1013 MMS	42	7,7	6,6	4,1
LCY 1517 S/MMS	2 1/8	LCY 1517 S/MMS	54	12,3	10,5	6,5
LCY 1817 S/MMS	2 1/8	LCY 1817 S/MMS	54	17,4	15,0	9,3
LCY 3617 S/MMS	2 1/8	LCY 3617 S/MMS	54	27,2	23,3	14,5
LCY 3621 S	2 5/8	LCY 3621 MMS	67	26,0	22,3	13,8
LCY 3625 S	3 1/8	LCY 3625 MMS	80	24,6	21,1	13,1
LCY 5021 S	2 5/8	LCY 5021 MMS	67	42,0	36,1	22,4
LCY 5025 S	3 1/8	LCY 5025 MMS	80	39,9	34,3	21,2
LCY 7025 S	3 1/8	LCY 7025 MMS	80	59,1	50,7	31,4
LCY 7029 S	3 5/8	LCY 7029 MMS	89	56,7	48,6	30,1
LCY-ST						
LCY-ST 89 S	1 1/8	/	/	6,6	5,6	3,5
LCY-ST 1011 S/MMS	1 3/8	LCY-ST 1011 S/MMS	35	8,1	6,9	4,3
LCY-ST 1013 S	1 5/8	LCY-ST 1013 MMS	42	7,7	6,6	4,1



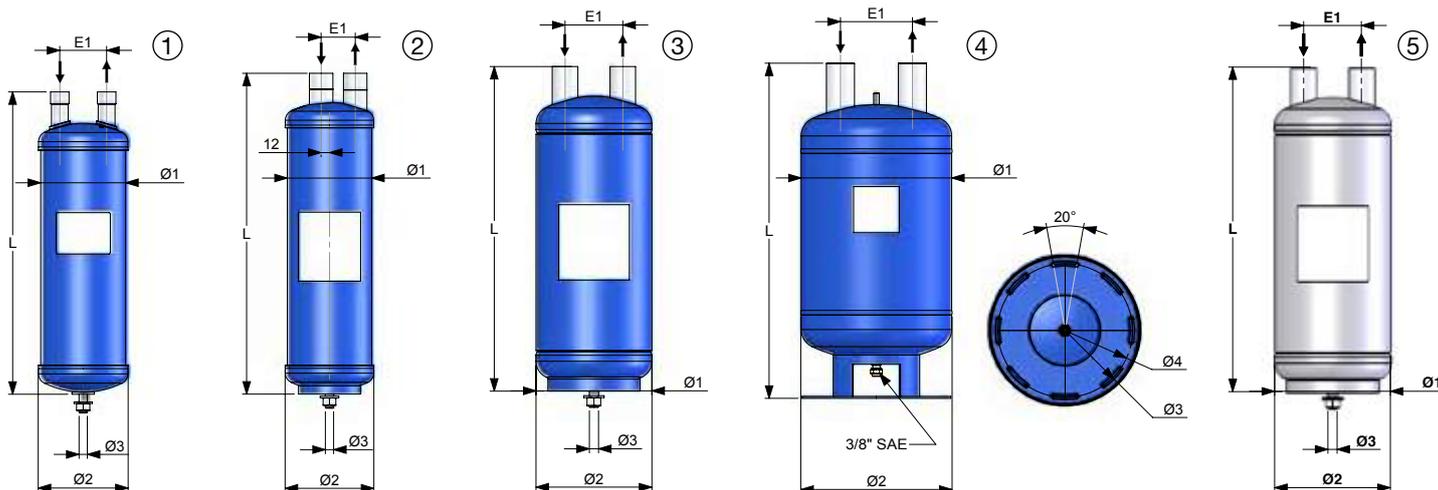
Suction line accumulators

CTCY-EN – 33.1-3 / 09-2014

→ LCY (without heat exchanger) / LCY-ST (stainless steel without heat exchanger)

■ Technical features

CARLY references		Drawing Nb	Dimensions mm						Possible retention volume L
			Ø1	Ø2	L	E1	Ø3	Ø4	
LCY 04 S	LCY 04 MMS	1	88,9	95	208	50	M10	/	0,09
LCY 14 S	LCY 14 MMS	1	88,9	95	299	50	M10	/	0,09
LCY 15 S/MMS		1	88,9	95	299	48	M10	/	0,10
LCY 16 S	LCY 16 MMS	1	88,9	95	299	37	M10	/	0,12
LCY 25 S/MMS		1	101,6	109	365	56	M10	/	0,13
LCY 26 S	LCY 26 MMS	1	101,6	109	365	56	M10	/	0,12
LCY 27 S/MMS		1	101,6	109	375	56	M10	/	0,14
LCY 47 S/MMS		1	101,6	109	488	56	M10	/	0,14
LCY 49 S	LCY 49 MMS	2	121,0	128	464	49	M12	/	0,16
LCY 69 S	LCY 69 MMS	3	152,4	156	430	76	M12	/	0,21
LCY 89 S	LCY 89 MMS	3	152,4	156	528	76	M12	/	0,21
LCY 611 S/MMS		3	152,4	156	436	76	M12	/	0,25
LCY 811 S/MMS		3	152,4	156	534	76	M12	/	0,25
LCY 813 S	LCY 813 MMS	3	152,4	156	534	73	M12	/	0,25
LCY 1011 S/MMS		3	152,4	156	644	76	M12	/	0,25
LCY 1013 S	LCY 1013 MMS	3	152,4	156	644	73	M12	/	0,25
LCY 1517 S/MMS		4	219,1	224	638	114	8 x Ø 10,2	190	0,48
LCY 1817 S/MMS		4	219,1	224	788	114	8 x Ø 10,2	190	0,48
LCY 3617 S/MMS		4	323,9	330	686	155	8 x Ø 10,2 x 50	290	1,60
LCY 3621 S	LCY 3621 MMS	4	323,9	330	727	155	8 x Ø 10,2 x 50	290	1,80
LCY 3625 S	LCY 3625 MMS	4	323,9	330	727	155	8 x Ø 10,2 x 50	290	2,10
LCY 5021 S	LCY 5021 MMS	4	323,9	330	927	155	8 x Ø 10,2 x 50	290	1,80
LCY 5025 S	LCY 5025 MMS	4	323,9	330	927	155	8 x Ø 10,2 x 50	290	2,10
LCY 7025 S	LCY 7025 MMS	4	323,9	330	1177	155	8 x Ø 10,2 x 50	290	2,10
LCY 7029 S	LCY 7029 MMS	4	323,9	330	1177	155	8 x Ø 10,2 x 50	290	2,30
LCY-ST									
LCY-ST 89 S	/	5	168,3	172	441	76	M10	/	0,17
LCY-ST 1011 S/MMS	LCY-ST 1011 S/MMS	5	168,3	172	551	73	M10	/	0,20
LCY-ST 1013 S	LCY-ST 1013 S/MMS	5	168,3	172	644	73	M10	/	0,20





Suction line accumulators

➔ **LCY** (without heat exchanger) / **LCY-ST** (stainless steel without heat exchanger)

■ Technical features

CARLY references		Volume V L	Maximal working pressure PS bar	Working pressure (1) PS BT bar	Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature (1) TS BT °C	CE Category (2)
LCY 04 S	LCY 04 MMS	0,9	46	15	100	-40	-30	Art 3§3
LCY 14 S	LCY 14 MMS	1,5	46	15	100	-40	-30	I
LCY 15 S/MMS		1,5	46	15	100	-40	-30	I
LCY 16 S	LCY 16 MMS	1,5	46	15	100	-40	-30	I
LCY 25 S/MMS		2,3	46	15	100	-40	-30	I
LCY 26 S	LCY 26 MMS	2,3	46	15	100	-40	-30	I
LCY 27 S/MMS		2,3	46	15	100	-40	-30	I
LCY 47 S/MMS		3,2	46	15	100	-40	-30	I
LCY 49 S	LCY 49 MMS	4,2	46	15	100	-40	-30	I
LCY 69 S	LCY 69 MMS	5,8	33	15	100	-40	-30	I
LCY 89 S	LCY 89 MMS	7,5	26	15	100	-40	-30	I
LCY 611 S/MMS		5,7	33	15	100	-40	-30	I
LCY 811 S/MMS		7,3	27	15	100	-40	-30	I
LCY 813 S	LCY 813 MMS	7,3	27	15	100	-40	-30	I
LCY 1011 S/MMS		9,2	46	15	100	-40	-30	II
LCY 1013 S	LCY 1013 MMS	9,2	46	15	100	-40	-30	II
LCY 1517 S/MMS		15,2	45	15	100	-40	-30	II
LCY 1817 S/MMS		20,2	45	15	100	-40	-30	II
LCY 3617 S/MMS		35,4	27	15	100	-40	-30	II
LCY 3621 S	LCY 3621 MMS	35,6	27	15	100	-40	-30	II
LCY 3625 S	LCY 3625 MMS	35,9	27	15	100	-40	-30	II
LCY 5021 S	LCY 5021 MMS	50,6	42	15	100	-40	-30	III
LCY 5025 S	LCY 5025 MMS	50,9	42	15	100	-40	-30	III
LCY 7025 S	LCY 7025 MMS	70,9	42	15	100	-40	-30	III
LCY 7029 S	LCY 7029 MMS	71,2	42	15	100	-40	-30	III
LCY-ST								
LCY-ST 89 S	/	7,6	26 ⁽³⁾	/	80	-80 ⁽³⁾	/	I
LCY-ST 1011 S/MMS	LCY-ST 1011 S/MMS	11,4	26 ⁽³⁾	/	80	-80 ⁽³⁾	/	II
LCY-ST 1013 S	LCY-ST 1013 MMS	11,4	26 ⁽³⁾	/	80	-80 ⁽³⁾	/	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

⁽³⁾ Limitation of the working pressures PSBT depending on the temperatures: 15 bar from -30°C to -50°C
8 bar from -50°C to -80°C.



Suction line accumulators

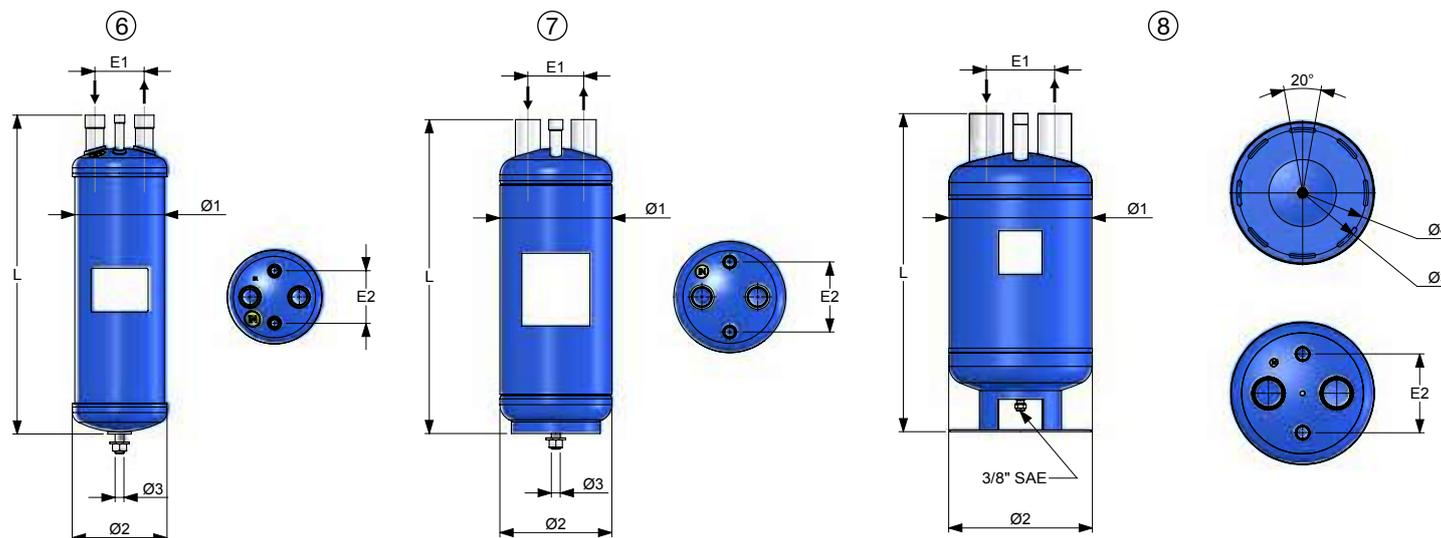
→ LCYE (with heat exchanger)

■ Selection table

CARLY references	Connections to solder ODF inch	Heat exchangers connections to solder ODF inch	CARLY references	Connections to solder ODF mm	Heat exchangers connections to solder ODF mm	Capacity of accumulator kg of refrigerant at 30 °C		
						R134a R407C R22 - R407F	R404A R410A R507	R744
LCYE 25 S	5/8	3/8	LCYE 25 MMS	16	10	2,1	1,8	1,1
LCYE 26 S	3/4	3/8	LCYE 26 MMS	18	10	2,1	1,8	1,1
LCYE 47 S	7/8	1/2	LCYE 47 MMS	22	12	2,8	2,4	1,5
LCYE 69 S	1 1/8	5/8	LCYE 69 MMS	28	16	4,8	4,1	2,6
LCYE 811 S/MMS	1 3/8	5/8	LCYE 811 S/MMS	35	16	6,2	5,3	3,3
LCYE 1013 S	1 5/8	3/4	LCYE 1013 MMS	42	18	7,7	6,6	4,1
LCYE 1517 S/MMS	2 1/8	7/8	LCYE 1517 S/MMS	54	22	12,3	10,5	6,5
LCYE 3621 S	2 5/8	1 1/8	LCYE 3621 MMS	67	28	26,0	22,3	13,8
LCYE 3625 S	3 1/8	1 3/8	LCYE 3625 MMS	80	35	24,6	21,1	13,1

■ Technical features

CARLY references	Drawing Nb	Dimensions mm								Possible retention volume L
		Ø1	Ø2	L	E1	E2	Ø3	Ø4		
LCYE 25 S	LCYE 25 MMS	6	101,6	109	365	56	60	M10	/	0,13
LCYE 26 S	LCYE 26 MMS	6	101,6	109	365	56	60	M10	/	0,12
LCYE 47 S	LCYE 47 MMS	6	101,6	109	488	56	70	M10	/	0,14
LCYE 69 S	LCYE 69 MMS	7	152,4	156	430	76	96	M12	/	0,21
LCYE 811 S/MMS		7	152,4	156	534	76	96	M12	/	0,25
LCYE 1013 S	LCYE 1013 MMS	7	152,4	156	644	73	96	M12	/	0,25
LCYE 1517 S/MMS		8	219,1	224	638	114	141	8 x Ø 10,2	190	0,48
LCYE 3621 S	LCYE 3621 MMS	8	323,9	330	727	155	180	8 x Ø 10,2 x 50	290	1,80
LCYE 3625 S	LCYE 3625 MMS	8	323,9	330	727	155	180	8 x Ø 10,2 x 50	290	2,10





Suction line accumulators

→ LCYE (with heat exchanger)

■ Technical features

CARLY references		Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
LCYE 25 S	LCYE 25 MMS	2,3	46	15	100	-40	-30	I
LCYE 26 S	LCYE 26 MMS	2,3	46	15	100	-40	-30	I
LCYE 47 S	LCYE 47 MMS	3,2	46	15	100	-40	-30	I
LCYE 69 S	LCYE 69 MMS	5,8	33	15	100	-40	-30	I
LCYE 811 S/MMS		7,3	27	15	100	-40	-30	I
LCYE 1013 S	LCYE 1013 MMS	9,1	33	15	100	-40	-30	II
LCYE 1517 S/MMS		15,2	33	15	100	-40	-30	II
LCYE 3621 S	LCYE 3621 MMS	35,6	27	15	100	-40	-30	II
LCYE 3625 S	LCYE 3625 MMS	35,0	27	15	100	-40	-30	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

→ LCY (without heat exchanger) / LCYE (with heat exchanger) / LCY-ST (stainless steel without heat exchanger)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
LCY 04 S & MMS	1,27	1,16	6	LCY 3621 S & MMS	47,10	45,70	1
LCY 14 S & MMS	1,73	1,61	6	LCY 3625 S & MMS	48,75	47,35	1
LCY 15 S/MMS	1,82	1,71	6	LCY 5021 S & MMS	58,50	57,10	1
LCY 16 S & MMS	1,98	1,86	6	LCY 5025 S & MMS	60,50	59,10	1
LCY 25 S/MMS	2,48	2,24	1	LCY 7025 S & MMS	76,40	75,00	1
LCY 26 S & MMS	3,60	3,20	1	LCY 7029 S & MMS	80,40	79,00	1
LCY 27 S/MMS	2,71	2,48	1	LCY-ST 89 S	9,00	8,50	1
LCY 47 S/MMS	3,38	3,14	1	LCY-ST 1011 S/MMS	15,10	14,50	1
LCY 49 S & MMS	5,54	5,27	1	LCY-ST 1013 S & MMS	15,60	15,00	1
LCY 69 S & MMS	6,85	6,53	1	LCYE 25 S & MMS	2,73	2,49	1
LCY 89 S & MMS	8,18	7,85	1	LCYE 26 S & MMS	2,92	2,69	1
LCY 611 S/MMS	9,45	9,10	1	LCYE 47 S & MMS	3,38	3,14	1
LCY 811 S/MMS	9,74	9,41	1	LCYE 69 S & MMS	7,44	7,12	1
LCY 813 S & MMS	11,95	11,60	1	LCYE 811 S/MMS	10,60	10,40	1
LCY 1011 S/MMS	11,89	11,39	1	LCYE 1013 S & MMS	13,25	12,80	1
LCY 1013 S & MMS	12,57	11,92	1	LCYE 1517 S/MMS	22,35	21,85	1
LCY 1517 S/MMS	18,70	17,50	1	LCYE 3621 S & MMS	48,90	47,50	1
LCY 1817 S/MMS	26,00	24,80	1	LCYE 3625 S & MMS	53,40	52,00	1
LCY 3617 S/MMS	45,40	42,90	1				

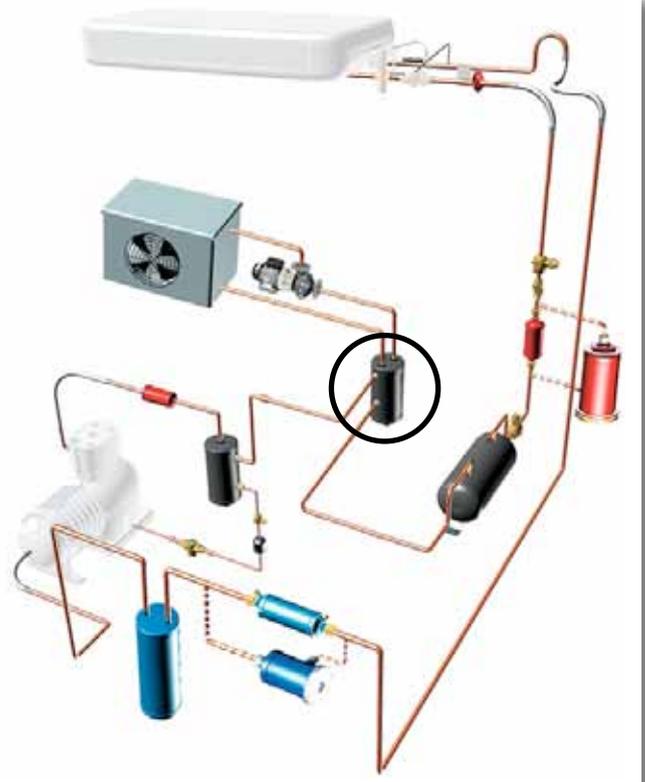


Water cooled condensers with liquid receiver

→ CONDOR-H (horizontal) / CONDOR-V (vertical)

■ Applications

- Water cooled condensers with liquid receiver ensure cooling, condensation and storage of refrigerant in refrigerating and air conditioning installations.
- They also allow storage of the refrigerant, in order to compensate volume variations due to the opening and closing sequences of the expansion valve.
- In CO₂ subcritical installations, they can be used as a liquid receiver with exchanger to keep temperature and pressure stable.
- Heat exchange is carried out by a water circulation inside a very high performance finned copper tubing coil.
- Energy recovery: The use of a water cooled condenser CONDOR allows to heat with lower costs water circulating in the exchanger (technical hot water ...)



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is done with the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Two ranges of water cooled condensers receivers for an installation and an operation in horizontal position for CONDOR-H and in vertical position for CONDOR-V.
- They are fitted with fastening means suited to their volume and to their weight.
- They can function with tap water, river water, tower water (treated or not), with glycol water and with refrigerants and heat transfer fluids.
- Presence of a 3/8" NPT boss on the model CONDOR-V 2500, for mounting of safety elements in accordance with the standard EN 378-2.

■ Possible customization on demand:

- Depending on the application, CARLY can transform its water cooled condensers in subcoolers.

■ CARLY advantages

- Maximum working pressure 46 bar.
- Water cooled condensers with receiver are supplied perfectly clean and dried.
- They offer both following connection possibilities for the refrigerant:
 - Outside of the connections to screw.
 - Inside of the connections to braze.
- Heat exchangers made of finned copper for very high performance.
- Low water consumptions.
- Low pressure drop on water.
- A wide range of accessories is available:
 - Rotalock stop valves, with connections to screw or to braze.
 - Rotalock connections with possibility of diameter reductions and with connections to braze.
- Reduction of the quantity of the refrigerant in the circuit compared to installations with air cooled condensers.
- GOST certified products.



Water cooled condensers with liquid receiver

→ CONDOR-H (horizontal) / CONDOR-V (vertical)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

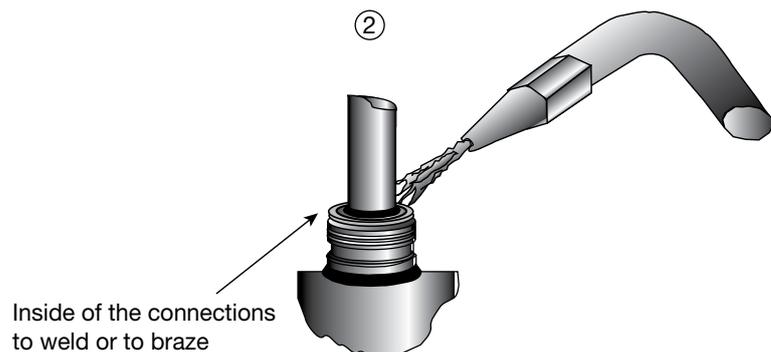
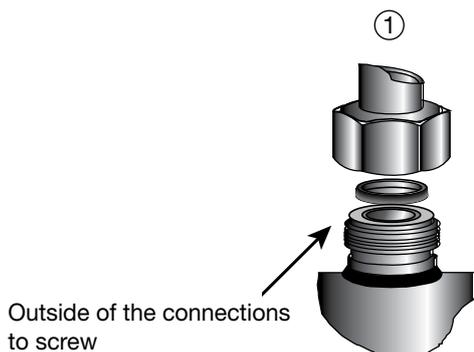
RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the water cooled condenser with liquid receiver CONDOR

- The water cooled condensers must be installed at the discharge of the compressors, horizontally for models CONDOR-H, vertically for models CONDOR-V and in both cases, with their feet brackets at the bottom.
- For optimal operation, refrigerant and water flow directions should be respected ("IN" tag at the inlet of each circuit).
- If sizing of the receivers is performed on the basis of the total refrigerant load, it is imperative to select receivers with an internal volume 20 % bigger, so that the gas reserve is always above the liquid level.
- It is essential to ensure a water circulation before any handling on the refrigerating circuit (risk of freezing).
- Water circulating in the heat exchangers can freeze:
 - when the installation is running, if the refrigerant pressure decreases
 - when the installation is stopped, if the ambient temperature drops.
 It is therefore recommended to install appropriate frost protection devices.
- Be sure to maintain a good cleanliness of the water circuit using appropriate and regularly changed filters.
- Use of sea water strictly prohibited.
- The connections of the water cooled condensers CONDOR have an external screw thread (sketch 1) allowing the assembly of isolating valves or Rotalock connections, and an internal bore (sketch 2) allowing the brazing of a pipe.





Water cooled condensers with liquid receiver

→ CONDOR-H (horizontal)

■ Quick selection table

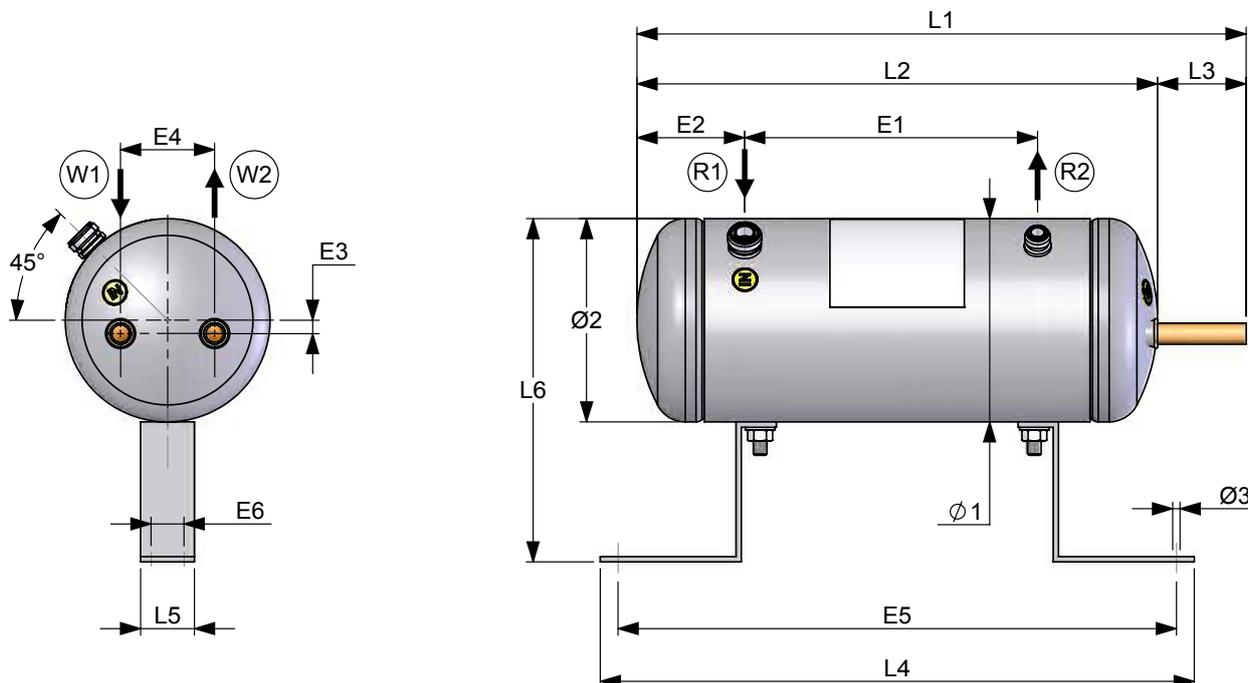
CARLY references	Gas inlet connections R1		Liquid outlet connections R2		Water inlet W1 and outlet W2 connections mm	Condensation capacity Qk (1) kW	Water flow m ³ /h	Water pressure drop bar	Volume of refrigerant	
	Outside of connections to screw UNF inch	Inside of connections to braze ODF inch	Outside of connections to screw UNF inch	Inside of connections to braze ODF inch					Maximum storage L	Without subcooling L
CONDOR-H 150	3/4	3/8	3/4	3/8	1/2 ODF	1,45	0,10	0,01	2,9	0,27
CONDOR-H 250	3/4	3/8	3/4	3/8	1/2 ODF	2,46	0,20	0,02	2,9	0,27
CONDOR-H 500	1	1/2	3/4	3/8	1/2 ODF	5,00	0,25	0,06	4,9	0,32
CONDOR-H 750	1	1/2	3/4	3/8	1/2 ODF	7,50	0,30	0,12	4,1	0,41
CONDOR-H 1000	1	1/2	3/4	3/8	1/2 ODF	9,90	0,40	0,16	6,3	0,41

(1) Refrigerant R404A ; Δt1 = 25 K ;

Δt1 = Condensing temperature - Water inlet temperature

■ Technical features

CARLY references	Dimensions mm															
	Ø1	Ø2	Ø3	L1	L2	L3	L4	L5	L6	E1	E2	E3	E4	E5	E6	
CONDOR-H 150	121,0	128	4 x Ø6,5 x 10	405	371	34	340	80	227	230	66	4	40	300	60	
CONDOR-H 250	121,0	128	4 x Ø6,5 x 10	405	371	34	340	80	227	230	66	4	40	300	60	
CONDOR-H 500	152,4	156	2 x Ø9 x 5,5	453	387	66	442	40	257	218	80	10	70	410	/	
CONDOR-H 750	121,0	128	4 x Ø6,5 x 10	531	497	34	340	80	227	360	68	4	40	300	60	
CONDOR-H 1000	152,4	156	2 x Ø9 x 5,5	565	499	66	442	40	257	348	71	10	70	410	/	





Water cooled condensers with liquid receiver

→ CONDOR-H (horizontal)

■ Technical features

CARLY references	Volume	Maximal working pressure	Heat exchanger maximal working pressure	Maximal working temperature	Minimal working temperature	Working temperature	CE Category ⁽¹⁾
	V L	PS bar	PS Ech. bar	TS maxi °C	TS mini °C	TS BT °C	
CONDOR-H 150	3,4	46	10	120	-20	/	I
CONDOR-H 250	3,2	46	10	120	-20	/	I
CONDOR-H 500	5,8	46	10	120	-20	/	II
CONDOR-H 750	4,0	46	10	120	-20	/	I
CONDOR-H 1000	7,4	46	10	120	-20	/	II

⁽¹⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

■ Example of selection of a CONDOR water cooled condenser with liquid receiver

The sizing of a product implies for the buyer to take into account the conditions under which the product will be used (temperature - pressure - refrigerant oil external environment). The values of the selection tables proposed in the CARLY catalogue match accurate test conditions.

- Installation operating with R404A under the following conditions⁽¹⁾:
 - $Qk_x = 7 \text{ kW}$
 - $T_k = 40 \text{ °C}$
 - $Tl_1 = 20 \text{ °C} \longrightarrow \Delta t_1 = 40 - 20 = 20\text{K}$
 - Maximum water flow = 500 l/h
 - Normal city water
- Which water cooled condenser CONDOR to choose?

1° Make corrections according to the water and the refrigerantes:

- 1-1 Correction according to fouling factor F_e (refer to page 34.5)
- 1-2 Correction according to refrigerant F_r (refer to page 34.5)

Result: $Qk = Qk_x \times F_e \times F_r = 7 \text{ kW}$

2° Report the capacity to the quick selection table, page 34.5

3° Report the maximum water flow to the quick selection table, page 34.5

4° Select the CONDOR H model.

Result:

CONDOR H -1000	→	$\Delta t_1 = 18\text{K}$
CONDOR H -750	→	$\Delta t_1 = 20\text{K}$
CONDOR H -500	→	$\Delta t_1 = 25\text{K}$

⁽¹⁾ Chapter «Abbreviations and units» (refer to chapter 113).



Water cooled condensers with liquid receiver

→ CONDOR-H (horizontal)

■ Technical features

- According to the type of water available, the condensation capacity (Q_{kx}) of the installation should be corrected in accordance to the fouling factor by the formula:

$$Q_k = Q_{kx} \times Fe$$

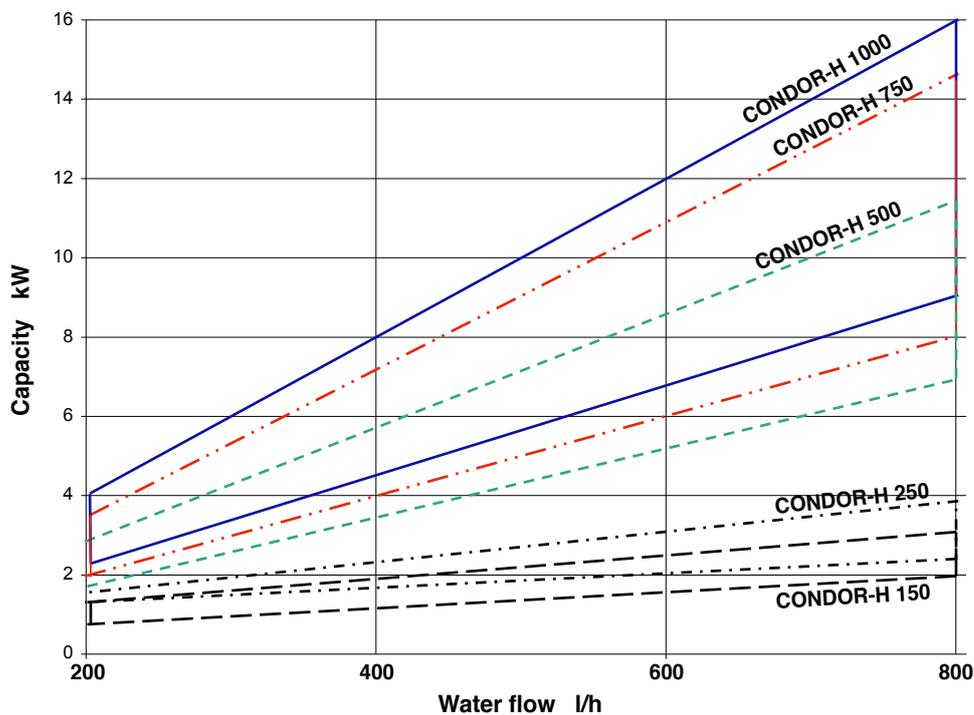
Water type	Fouling factor $m^2.K / W$	Correction factor Fe
Normal city water	43.10-6	1,00
Treated tower water	43.10-6	1,00
Untreated tower water	86.10-6	1,19
River water	86.10-6	1,19
Glycol water below 40 %	86.10-6	1,19
Glycol water below 70 %	172.10-6	1,56

- According to the type of refrigerant used, the condensation capacity (Q_{kx}) of the installation should be corrected in accordance to the following Fr factor by the formula:

$$Q_k = Q_{kx} \times Fr$$

Refrigerant	Correction factor Fr
R404A / R507	1,00
R 22 / R410A / R407F	0,92
R134a / R407C	0,85

■ Quick Selection Table



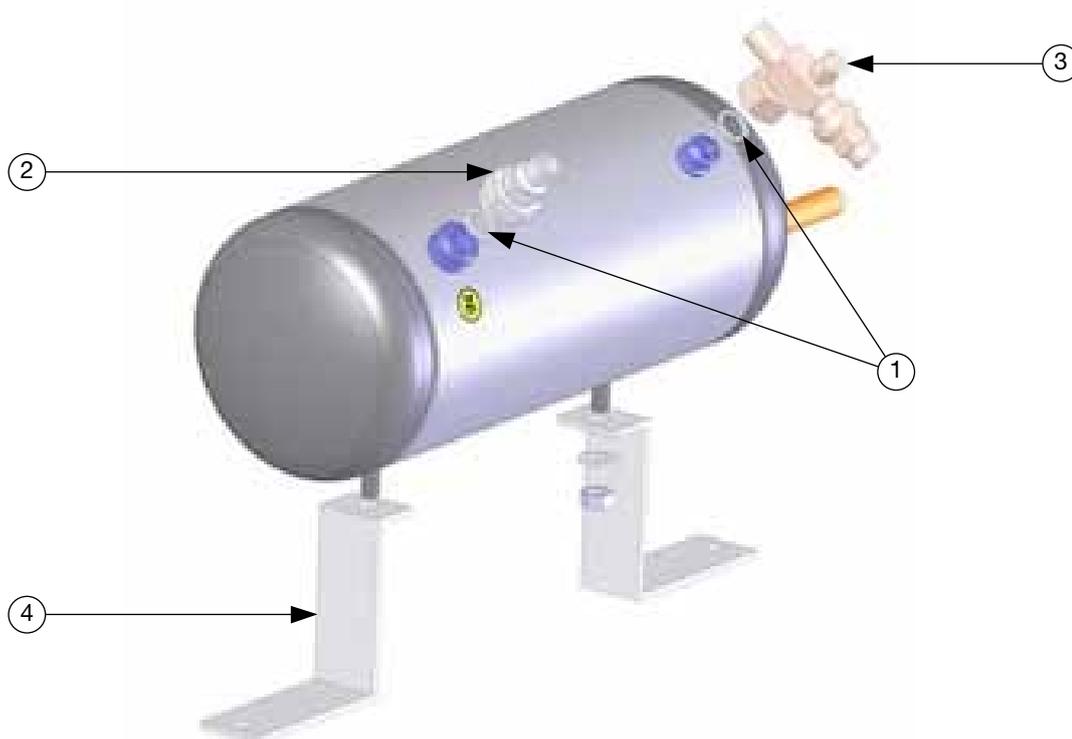
15K ≤ Δt1 ≤ 25K



Water cooled condensers with liquid receiver

→ CONDOR-H (horizontal)

■ Spares parts and options



CONDOR H ⁽¹⁾	CARLY references	Part N°	Flat gasket for valves and ROTALOCK connections inch
150 - 250 - 500(S) - 750(S) - 1000(S)	CY 15580100	1	1/4" et 3/8"
500(E) - 750(E) - 1000(E)	CY 15580140	1	1/2"

⁽¹⁾ (E) = Inlet, (S) = Outlet



CONDOR H ⁽¹⁾	CARLY references	Part N°	ROTALOCK connections, gasket included	
			ØA outlet ODF connection inch	ØB fixing UNF connector inch
150 - 250 - 500(S) - 750(S) - 1000(S)	CY 17400000	2	1/4	3/4
150 - 250 - 500(S) - 750(S) - 1000(S)	CY 17400010	2	3/8	3/4
500(E) - 750(E) - 1000(E)	CY 17400020	2	1/2	1

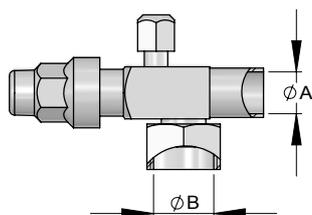
⁽¹⁾ (E) = Inlet, (S) = Outlet



Water cooled condensers with liquid receiver

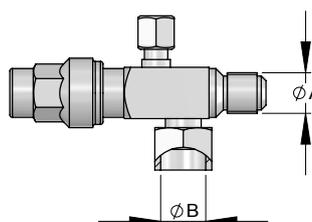
→ CONDOR-H (horizontal)

■ Spares parts and options



CONDOR H ⁽¹⁾	CARLY references	Part N°	ROTALOCK valve with connection to solder, gasket included	
			ØA outlet ODF valve inch	ØB fixing UNF valve inch
150 - 250 - 500(S) - 750(S) - 1000(S)	CY 19700080	3	1/4	3/4
150 - 250 - 500(S) - 750(S) - 1000(S)	CY 19700110	3	3/8	3/4
500(E) - 750(E) - 1000(E)	CY 19700120	3	1/2	1

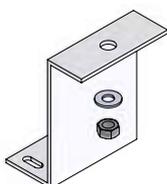
⁽¹⁾ (E) = Inlet, (S) = Outlet



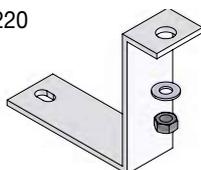
CONDOR H ⁽¹⁾	CARLY references	Part N°	ROTALOCK valve with connection to screw, gasket included	
			ØA outlet SAE valve inch	ØB fixing UNF valve inch
150 - 250 - 500(S) - 750(S) - 1000(S)	CY 19700090	3	1/4	3/4
150 - 250 - 500(S) - 750(S) - 1000(S)	CY 19700100	3	3/8	3/4
500(E) - 750(E) - 1000(E)	CY 19700140	3	1/2	1

⁽¹⁾ (E) = Inlet, (S) = Outlet

CY 37100210



CY 37100220



CONDOR H	CARLY references	Part N°	Description
150 - 250 - 750	CY 37100210	4	Support feet
500 - 1000	CY 37100220	4	Support feet

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CONDOR-H 150	5,65	5,20	1
CONDOR-H 250	8,65	8,20	1
CONDOR-H 500	11,30	11,00	1
CONDOR-H 750	7,65	7,20	1
CONDOR-H 1000	14,30	14,00	1



Water cooled condensers with liquid receiver

→ CONDOR-V (vertical)

■ Selection table

CARLY references	Gas inlet connections R1		Liquid outlet connections R2		Water inlet W1 and outlet W2 connections mm	Condensation capacity Qk kW	Water flow m ³ /h	Water pressure drop bar	Volume of refrigerant	
	Outside of connections to screw UNF inch	Inside of connections to braze ODF inch	Outside of connections to screw UNF inch	Inside of connections to braze ODF inch					Maximum storage L	Without subcooling L
CONDOR-V 100	3/4	3/8	3/4	3/8	1/2 ODF	1,11 ⁽¹⁾	0,10	0,01	2,0	1,00
CONDOR-V 150	3/4	3/8	3/4	3/8	1/2 ODF	1,52 ⁽¹⁾	0,10	0,01	2,7	1,80
CONDOR-V 240	3/4	3/8	3/4	3/8	1/2 ODF	2,39 ⁽¹⁾	0,20	0,02	2,7	1,70
CONDOR-V 500	1	1/2	3/4	3/8	1/2 ODF	4,90 ⁽¹⁾	0,30	0,07	6,1	2,50
CONDOR-V 1000	1 1/4	5/8	1	1/2	1/2 ODF	9,82 ⁽¹⁾	0,50	0,25	7,7	2,50
CONDOR-V 1400	1 1/4	5/8	1	1/2	1/2 ODF	14,56 ⁽²⁾	0,80	0,53	3,1	0,70
CONDOR-V 2500	1 3/4	7/8	1 1/4	5/8	G 3/4 M	25,50 ⁽²⁾	1,60	0,37	13,0	3,50

⁽¹⁾ Refrigerant R404A ; $\Delta t_1 = 20$ K ;

⁽²⁾ Refrigerant R404A ; $\Delta t_1 = 25$ K ;

$\Delta t_1 =$ Condensing temperature - Water inlet temperature

For more details on the selection of condensers, refer to pages 34-10 to 34-15.



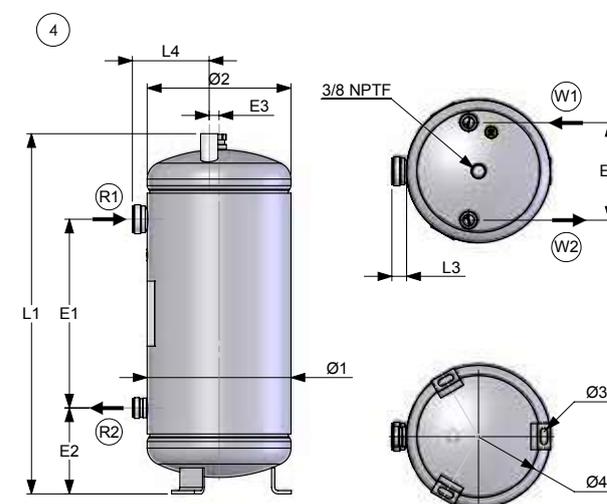
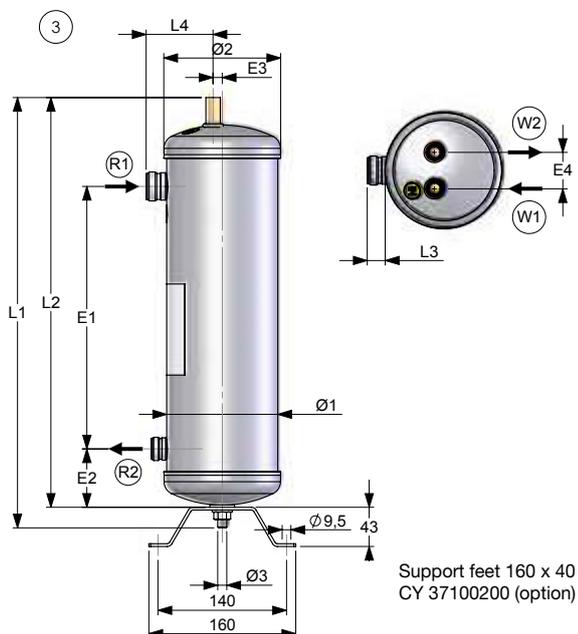
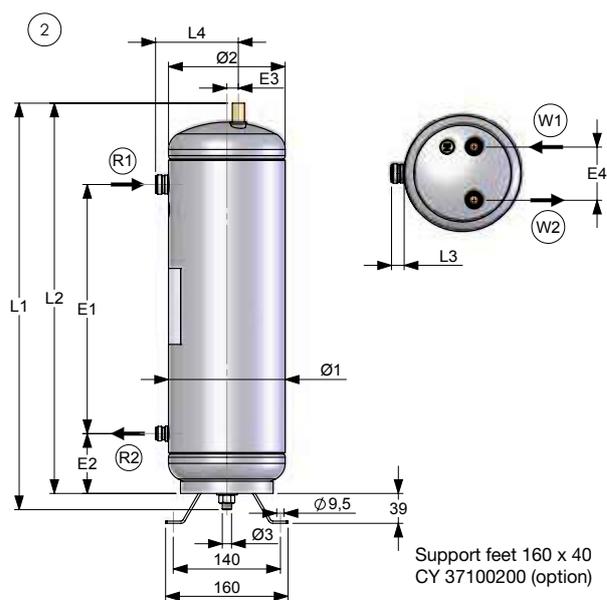
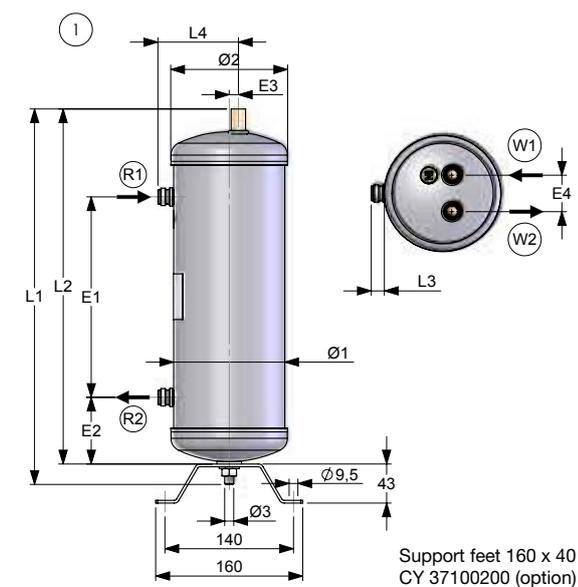
Water cooled condensers with liquid receiver

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→ CONDOR-V (vertical)

■ Technical features

CARLY references	Drawing Nb	Dimensions mm											
		Ø1	Ø2	L1	L2	L3	L4	E1	E2	E3	E4	Ø3	Ø4
CONDOR-V 100	1	121,0	128	341	319	14	88	145	73	10	40	M10	/
CONDOR-V 150	1	121,0	128	412	390	14	88	220	73	10	40	M10	/
CONDOR-V 240	1	121,0	128	412	390	14	88	220	73	10	40	M10	/
CONDOR-V 500	2	152,4	156	535	514	17	108	330	79	15	70	M12	/
CONDOR-V 1000	2	152,4	156	645	624	23	114	430	79	15	70	M12	/
CONDOR-V 1400	3	121,0	128	472	450	23	73	288	64	10	40	M10	/
CONDOR-V 2500	4	219,1	224	553	/	23	117	290	132	15	150	3 x 10.2 x 15	200





Water cooled condensers with liquid receiver

→ CONDOR-V (vertical)

■ Technical features

CARLY references	Volume	Maximal working pressure	Heat exchanger maximal working pressure	Maximal working temperature	Minimal working temperature	Working temperature	CE Category ⁽¹⁾
	V L	PS bar	PS Ech. bar	TS maxi °C	TS mini °C	TS BT °C	
CONDOR-V 100	2,6	46	10	120	-20	/	I
CONDOR-V 150	3,4	46	10	120	-20	/	I
CONDOR-V 240	3,2	46	10	120	-20	/	I
CONDOR-V 500	7,4	46	10	120	-20	/	II
CONDOR-V 1000	8,9	46	10	120	-20	/	II
CONDOR-V 1400	3,2	46	10	120	-20	/	I
CONDOR-V 2500	15,1	45	10	120	-20	/	II

⁽¹⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

■ Example of selection of a CONDOR water cooled condenser with liquid receiver

The sizing of a product implies for the buyer to take into account the conditions under which the product will be used (temperature - pressure - refrigerant oil external environment). The values of the selection tables proposed in the CARLY catalogue match accurate test conditions.

- Installation operating with R404A under the following conditions⁽¹⁾:
 - $Qk_x = 10 \text{ kW}$
 - $T_k = 40 \text{ °C}$
 - $T_{l1} = 20 \text{ °C} \longrightarrow \Delta t_1 = 40 - 20 = 20\text{K}$
 - Maximum water flow = 500 l/h
 - Normal city water
- Which water cooled condenser CONDOR to choose?

1° Make corrections according to the water and the refrigerantes:

- 1-1 Correction according to fouling factor F_e (refer to page 34.11)
- 1-2 Correction according to refrigerant F_r (refer to page 34.11)

Result: $Qk = Qk_x \times F_e \times F_r = 10 \text{ kW}$

2° Report the capacity to the quick selection table, page 34.11, and take note of possible condensers.

Result: CONDOR-V 500, CONDOR-V 1000, CONDOR-V 1400, CONDOR-V 2500

3° Search on the condenser feature curves, pages 34-6 to 34-9, the most suitable condenser.

- Result:
- CONDOR V-500 works with Δt_1 of 25K (page 34-13)
(does not match because $\Delta t_1 > 20\text{K}$).
 - CONDOR V-1000 matches perfectly (page 34-14).
 - CONDOR V-1400 works with a water flow of 700 l/h (page 34-14)
(does not match because water flow $> 500 \text{ l/h}$)
 - CONDOR V-2500 is too powerful because $\Delta t_1 < 20\text{K}$ (page 34-15).

4° Select the CONDOR V-1000 model and determine on the curves the water Δt and the water pressure drop (page 34-14).

Result: $\Delta t \text{ water} = 16,5\text{K}$
 $\Delta p \text{ water} = 0,25 \text{ bar}$

⁽¹⁾ Chapter «Abbreviations and units» (refer to chapter 113).



Water cooled condensers with liquid receiver

→ CONDOR-V (vertical)

■ Technical features

- According to the type of water available, the condensation capacity (Q_{kx}) of the installation should be corrected in accordance to the fouling factor by the formula:

$$Q_k = Q_{kx} \times F_e$$

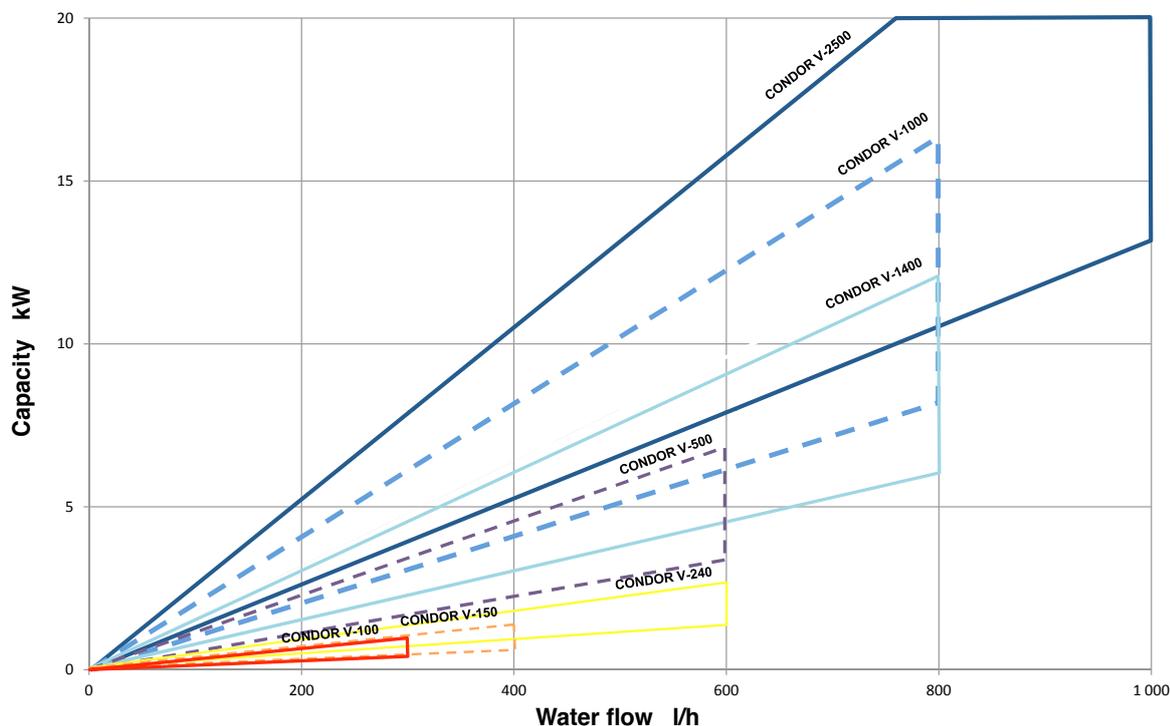
Water type	Fouling factor $m^2.K / W$	Correction factor F_e
Normal city water	43.10-6	1,00
Treated tower water	43.10-6	1,00
Untreated tower water	86.10-6	1,19
River water	86.10-6	1,19
Glycol water below 40 %	86.10-6	1,19
Glycol water below 70 %	172.10-6	1,56

- According to the type of refrigerant used, the condensation capacity (Q_{kx}) of the installation should be corrected in accordance to the following F_r factor by the formula:

$$Q_k = Q_{kx} \times F_r$$

Refrigerant	Correction factor F_r
R404A / R507	1,00
R 22 / R410A / R407F	0,92
R134a / R407C	0,85

■ Quick Selection Table

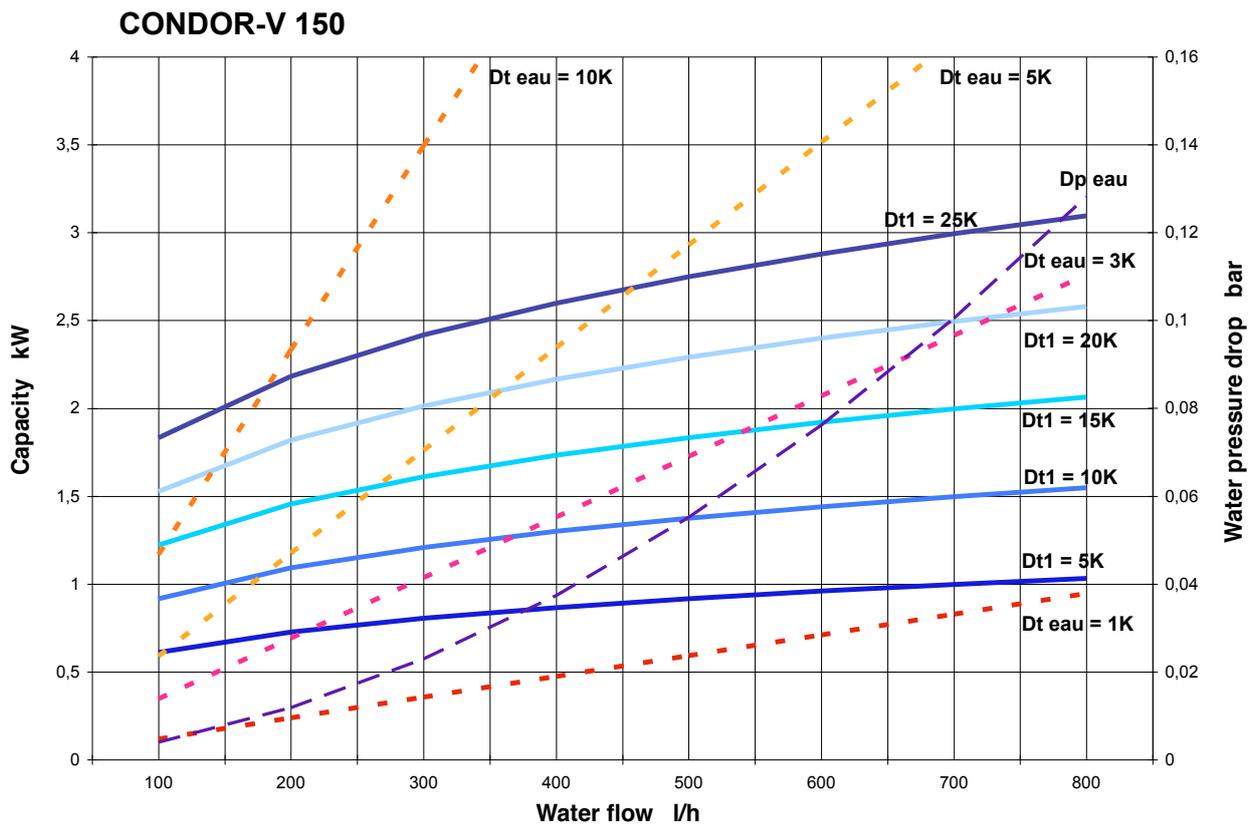
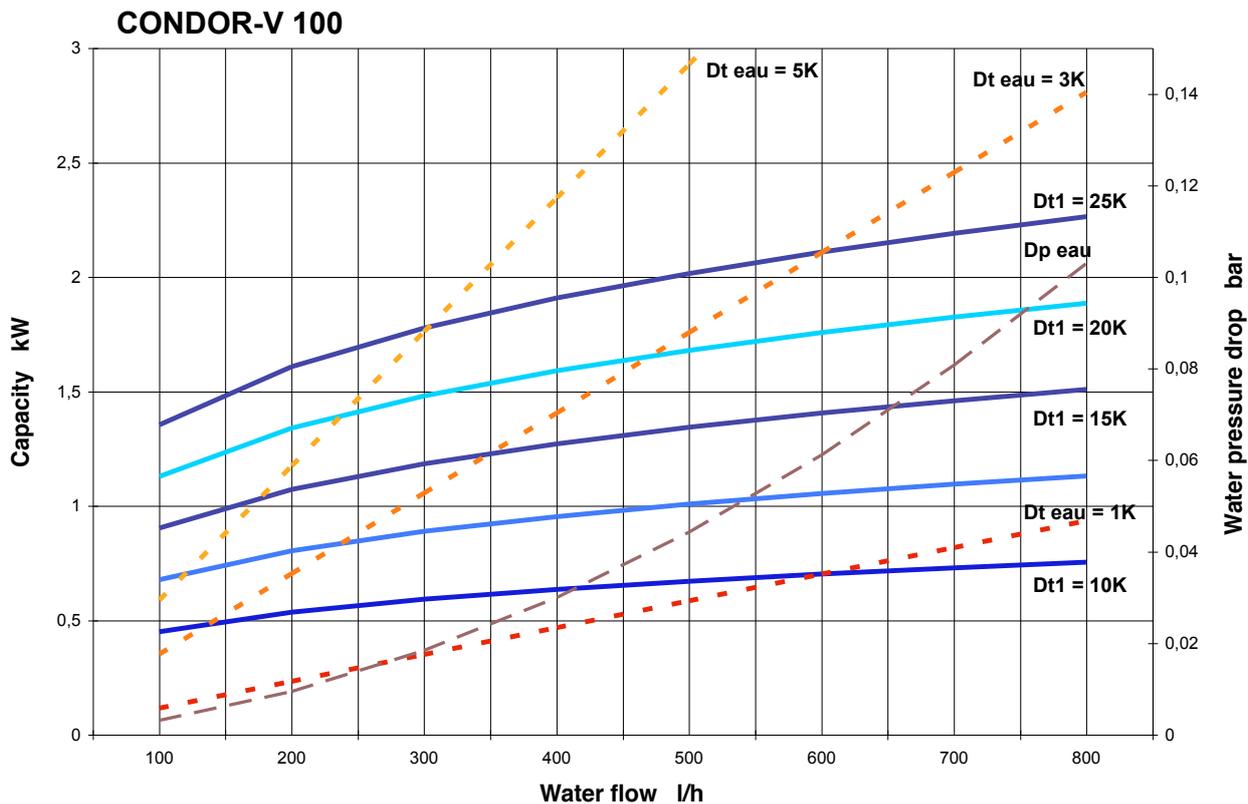




Water cooled condensers with liquid receiver

→ CONDOR-V (vertical)

■ Technical features

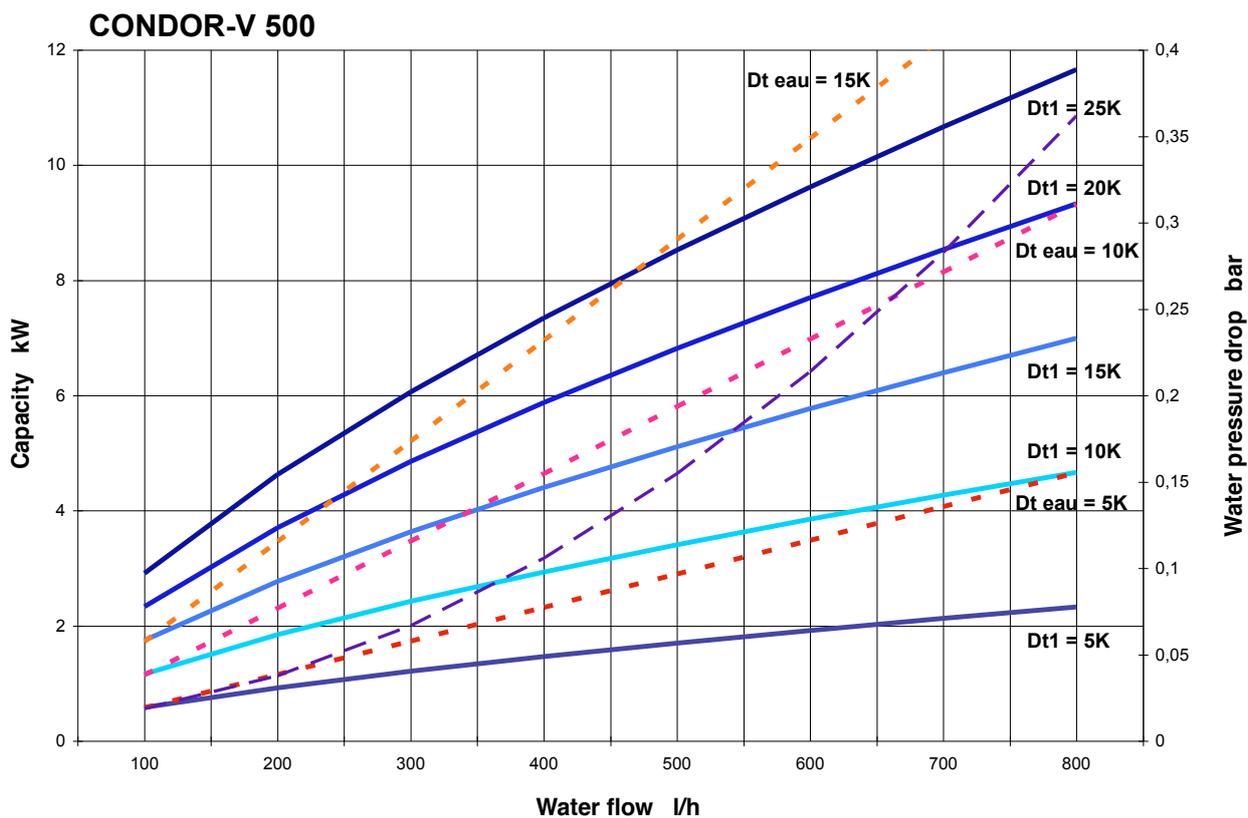
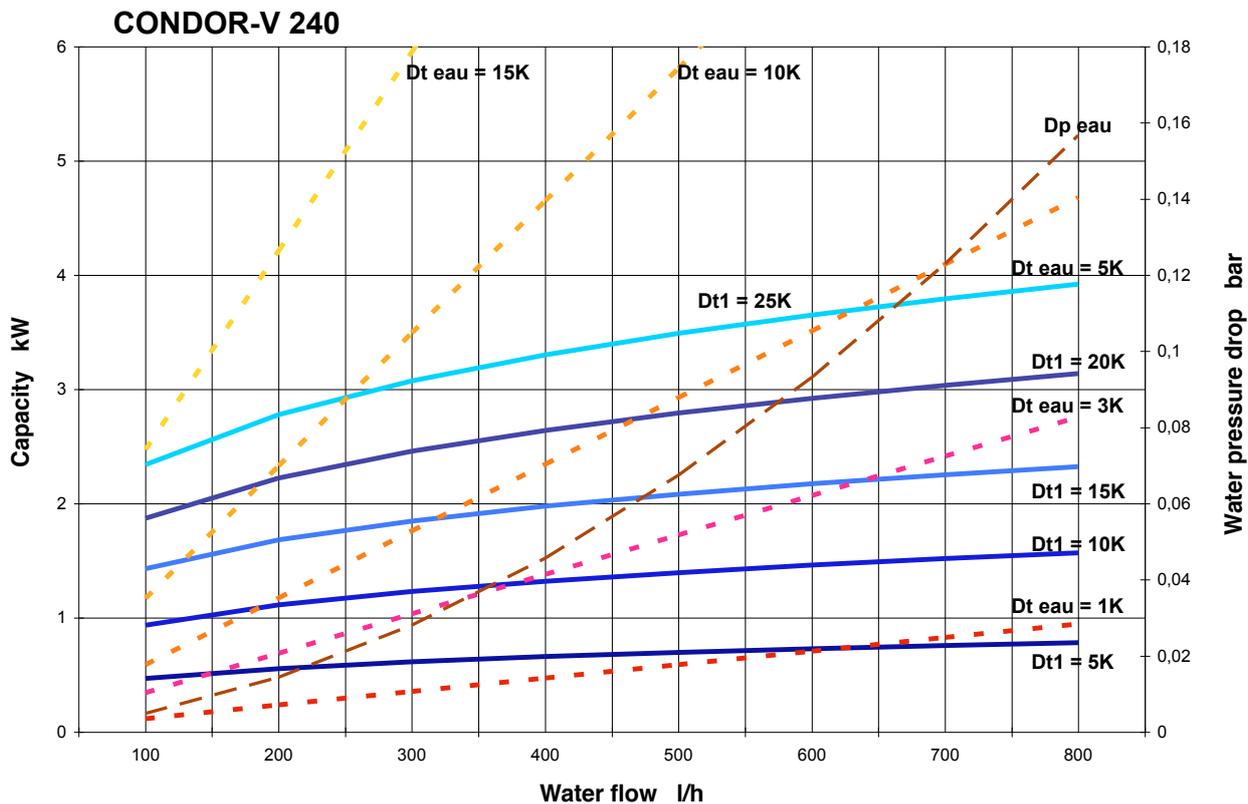




Water cooled condensers with liquid receiver

→ CONDOR-V (vertical)

■ Technical features

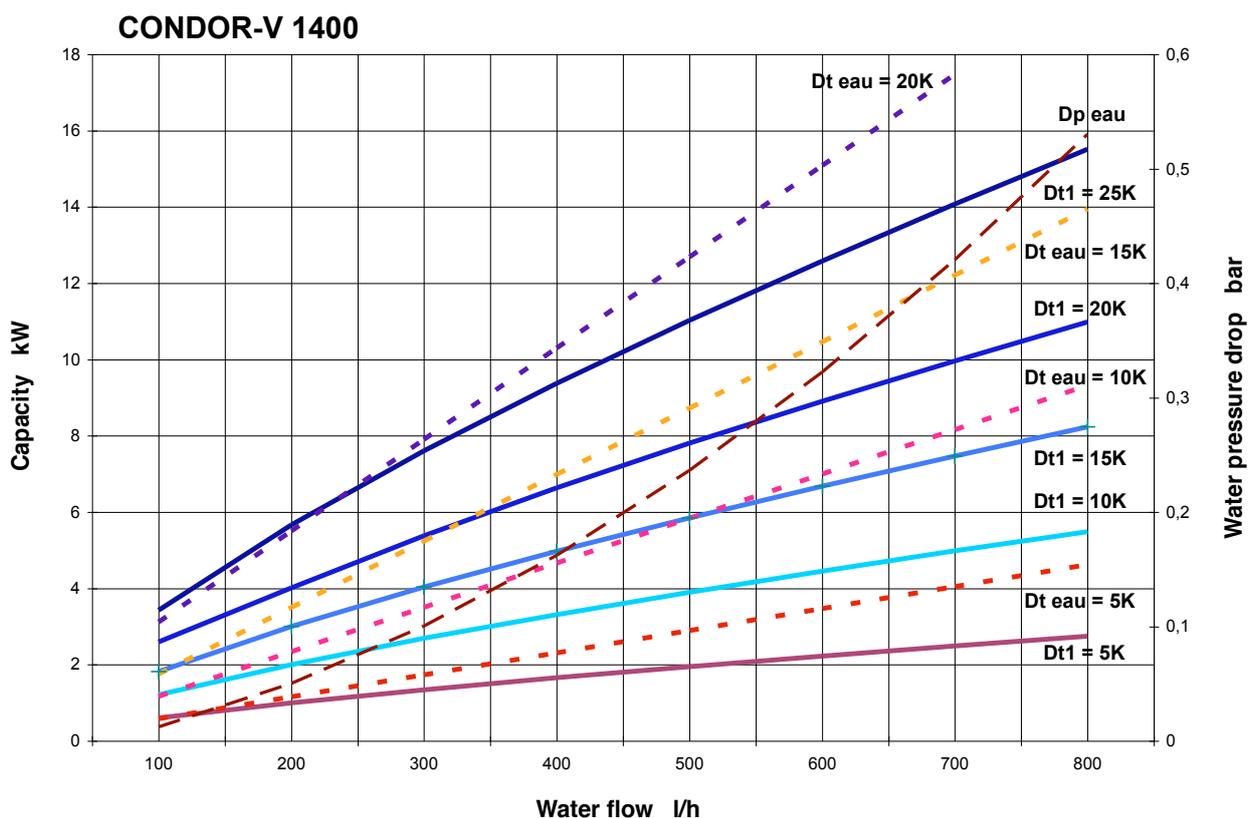
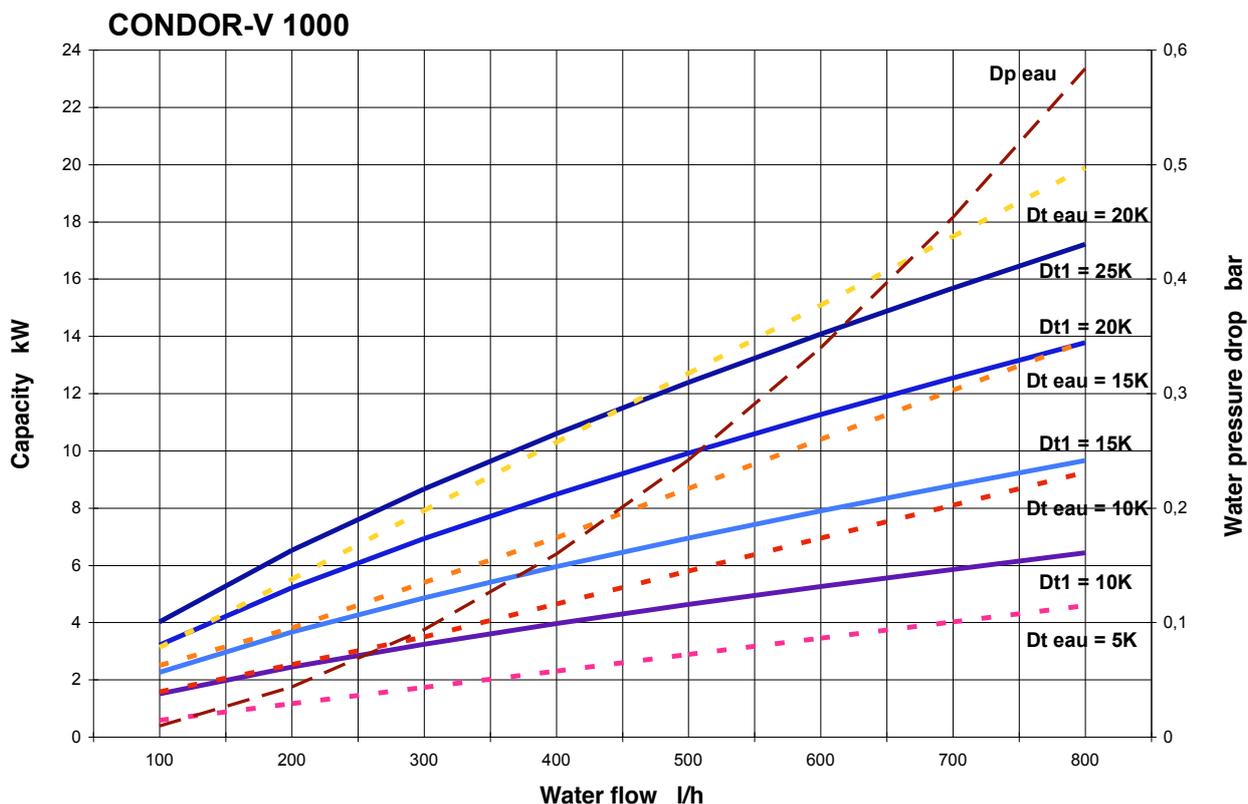




Water cooled condensers with liquid receiver

→ CONDOR-V (vertical)

■ Technical features



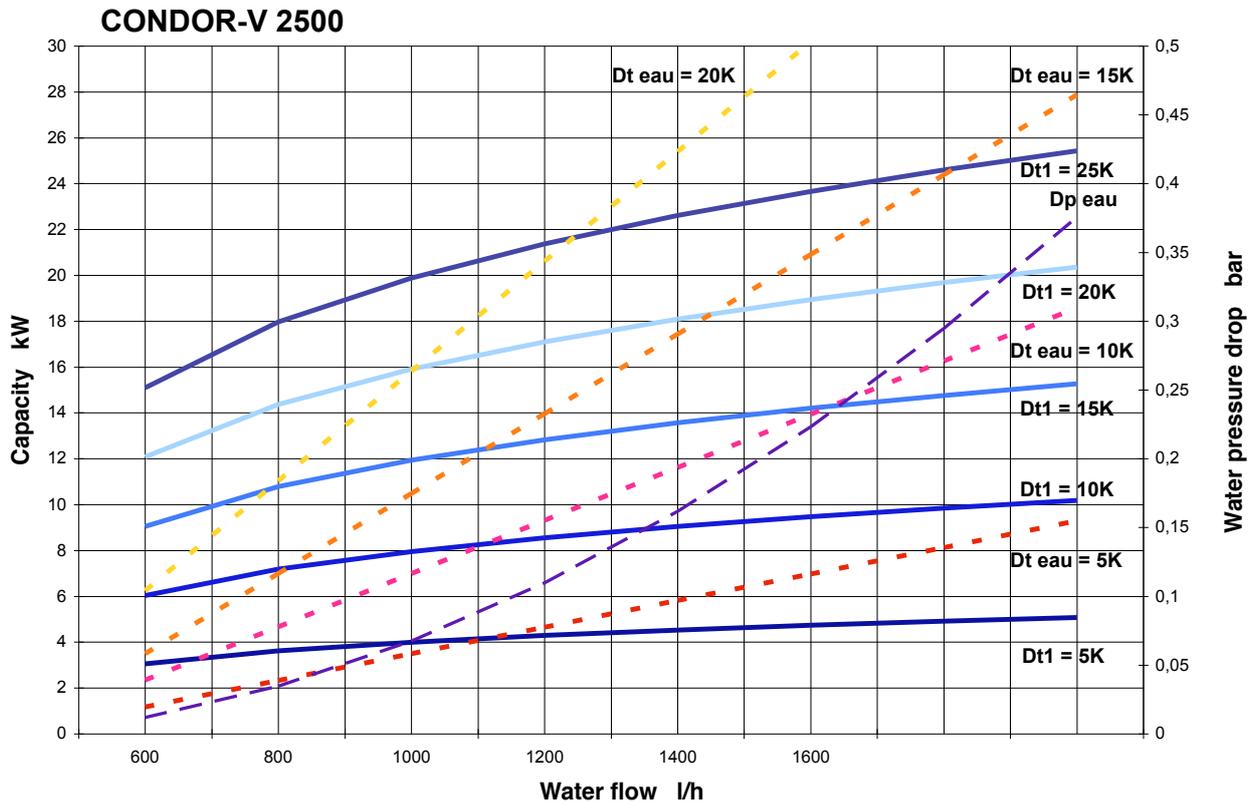


Water cooled condensers with liquid receiver

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→ CONDOR-V (vertical)

■ Technical features

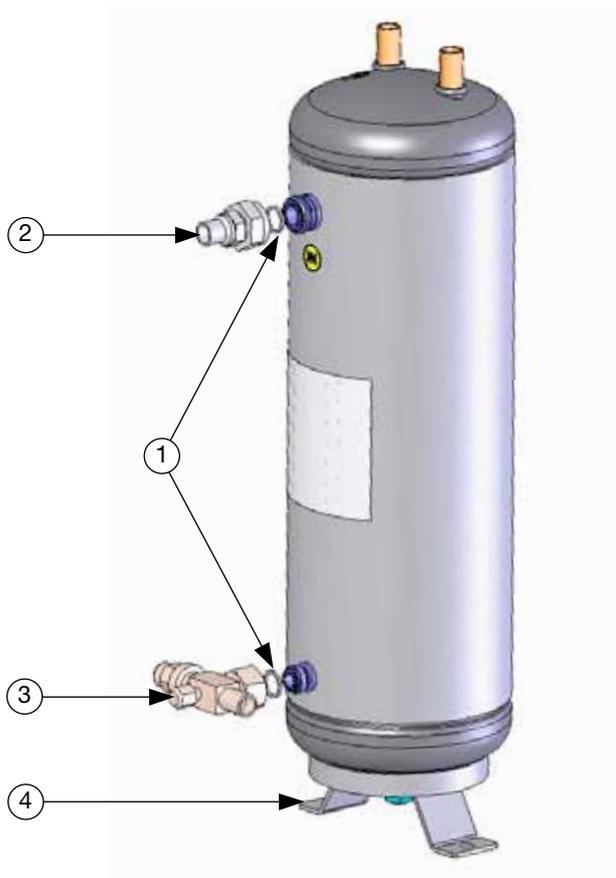




Water cooled condensers with liquid receiver

→ CONDOR-V (vertical)

■ Spare parts and options



CONDOR V ⁽¹⁾	CARLY references	Part N°	Gasket for ROTALOCK connections and valves inch
100 - 150 - 240 - 500(S)	CY 15580100	1	1/4, 3/8
1000(E)-1400(E)-2500(S)	CY 15580120	1	5/8, 7/8, 1 1/8
500(E)-1000 (S)-1400(S)	CY 15580140	1	1/2

⁽¹⁾ (E) = Inlet, (S) = Outlet



CONDOR V ⁽¹⁾	CARLY references	Part N°	ROTALOCK connections, gasket included	
			ØA outlet ODF connection inch	ØB fixing UNF connector inch
100 - 150 - 240 - 500(S)	CY 17400000	2	1/4	3/4
100 - 150 - 240 - 500(S)	CY 17400010	2	3/8	3/4
500(E)-1000(S)-1400(S)	CY 17400020	2	1/2	1
1000(E)-1400(E)-2500(S)	CY 17400035	2	5/8	1 1/4
1000(E)-1400(E)-2500(S)	CY 17400040	2	7/8	1 1/4
1000(E)-1400(E)-2500(S)	CY 17400050	2	1 1/8	1 1/4

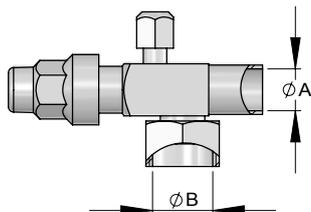
⁽¹⁾ (E) = Inlet, (S) = Outlet



Water cooled condensers with liquid receiver

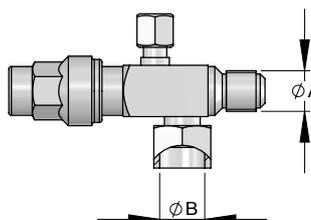
→ CONDOR-V (vertical)

■ Spare parts and options



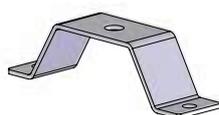
CONDOR V ⁽¹⁾	CARLY references	Part N°	ROTALOCK valve with connection to solder, gasket included	
			ØA outlet ODF valve inch	ØB fixing UNF valve inch
100 - 150 - 240 - 500(S)	CY 19700080	3	1/4	3/4
100 - 150 - 240 - 500(S)	CY 19700110	3	3/8	3/4
500(E)-1000(S)-1400(S)	CY 19700120	3	1/2	1
500(E)-1000(S)-1400(S)	CY 19700130	3	5/8	1
1000(E)-1400(E)-2500(S)	CY 19700135	3	5/8	1 1/4
1000(E)-1400(E)-2500(S)	CY 19700160	3	7/8	1 1/4
1000(E)-1400(E)-2500(S)	CY 19700170	3	1 1/8	1 1/4

⁽¹⁾ (E) = Inlet, (S) = Outlet



CONDOR V ⁽¹⁾	CARLY references	Part N°	ROTALOCK valve with connection to screw, gasket included	
			ØB fixing SAE valve inch	ØB fixing UNF valve inch
100 - 150 - 240 - 500(S)	CY 19700090	3	1/4	3/4
100 - 150 - 240 - 500(S)	CY 19700100	3	3/8	3/4
500(E)-1000(S)-1400(S)	CY 19700140	3	1/2	1

⁽¹⁾ (E) = Inlet, (S) = Outlet



CONDOR V	CARLY references	Part N°	Description
100 - 150 - 240 - 500 - 1000 - 1400	CY 37100200	4	Support feet

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CONDOR-V 100	4,50	4,20	1
CONDOR-V 150	5,65	5,20	1
CONDOR-V 240	5,65	5,20	1
CONDOR-V 500	11,10	10,80	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CONDOR-V 1000	14,30	14,00	1
CONDOR-V 1400	7,65	7,20	1
CONDOR-V 2500	26,10	25,50	1

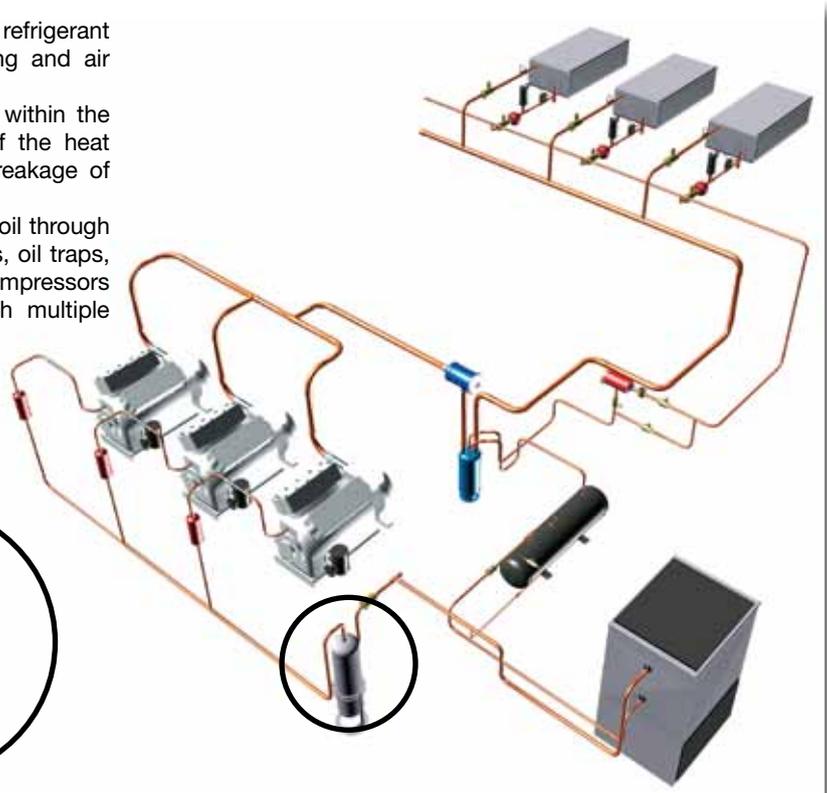


Oil separators

→ TURBOIL® (welded) / TURBOIL-F® (flanged)

■ Applications

- Separation and recovery of the oil carried by the refrigerant in vapour phase at compressor outlet of refrigerating and air conditioning installations.
- The TURBOIL® oil separators limit the amount of oil within the circuit, thus allowing increasing the performances of the heat exchangers and prevent abnormal wear, even the breakage of compressors by lack of oil.
- They must be used in applications where the return of oil through the suction is not guaranteed: facilities with long pipes, oil traps, with evaporation temperatures lower than - 5 °C, with compressors in parallel, or with variable speed, for systems with multiple compressor stages in cascade, Flood, Booster...
- They ensure a regulated oil return to the compressor crankcases and participate by their position on the circuit, in the reduction of the vibrations generated by the compressors and sound level of the discharge gas.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Two models are offered:
 - a welded version: TURBOIL®; these models have built-in fastening means
 - a flanged version: TURBOIL-F®, allowing cleaning the float/needle oil return system; these models are not fitted with built-in fastening, means: appropriate support legs are available as an option.
- The automatic regulation of the oil return directly to the compressor crankcases or through an oil receiver is ensured by a robust, accurate and protected unit (float, valve, and needle)
- Several maximum operating differential pressure: ΔPf = discharge pressure - pressure of oil return circuit.



Possible customization on demand:

- Separator with oil return by capillary (onboard refrigeration)
- Centrifugal separator

■ CARLY advantages

- Maximum working pressure up to 46 bar.
- Reliability and efficiency of the TURBOIL® oil separators are ensured thanks to a CARLY patented process, simultaneously associating several oil separation techniques:
 - centrifugation by helical motion generated by one or several spirals
 - coalescence thanks to the needled material of these spirals
 - sudden modification of speed by increase of the flow area located at the separator's inlet
 - sudden change of direction: inlet of the mixture by the top, outlet of the refrigerant from the higher lateral part and outlet of the oil from the lower part.
- Low pressure drop compare to a separator using coalescent cores
- Do not need specific maintenance operations, because there is no cores to be replace periodically.
- The presence of an internal baffle eliminates a new risk of the oil being carried by the refrigerant.
- Presence of a 1/4" NPT drain plug in the lower part from model TURBOIL® F-7011 S/MMS to model TURBOIL 9017 S/MMS and from model TURBOIL-F 2505 S/MMS to model TURBOIL-F 30025 S/MMS.
- GOST certified products.



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Oil separators

→ TURBOIL® (welded) / TURBOIL-F® (flanged)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the oil separators TURBOIL

- To select the TURBOIL® oil separators, it is necessary to refer to the selection tables in the following pages, taking into account:
 - the refrigerating capacity
 - the type of refrigerant used
 - the evaporation and condensation temperatures.
 - the maximum operating differential pressure: ΔP_f
- Oil separators should be installed vertically on the discharge line, as close as possible to the compressor.
- Refrigerant flow direction with inlet from the top is imperative and identified on the upper cover plate with the letters "IN".
- Connection diameter of the oil separators should be higher than or equal to the diameter of the discharge line.
- In the case of a multi-compressor installation mounted in parallel, it is recommended to use one oil separator by compressor, in order to keep an optimal efficiency at all operating rates; otherwise, the separator should be selected based on the sum of each compressor's maximum capacity.
- The oil separation performances will depend directly on the flow rate of the oil/refrigerant mixture at the inlet of the separators.
- The oil return connection is done either at the filling plug on the compressor crankcase, or in the case of multi-compressor installations, at the oil receiver.
- In order to prevent all risks of refrigerant condensation, it is recommended to not install the oil separators in the air flow produced by the fans; in a cold environment, it may be necessary to provide for the installation of an heat insulation or a heating element around the separators.
- Before connecting the oil separator, it is necessary to introduce, by the higher

connection, an oil load corresponding to the load in litre indicated in the oil separator technical features tables. Use the same oil as the compressor.

- In case of implantation of a TURBOIL® oil separator after installation commissioning, it is necessary to monitor the oil level in the compressor crankcase, in order to collect a possible oil surplus caused by a return of the lubricant accumulated in the refrigerating circuit.
- An efficient oil return system design requires that all the components (TURBOIL®, HCYR, HCYCT, HCYF, LEVOIL, HYDROIL and HCYVP) are correctly selected according to

the installation's refrigerating capacity and operating rates.

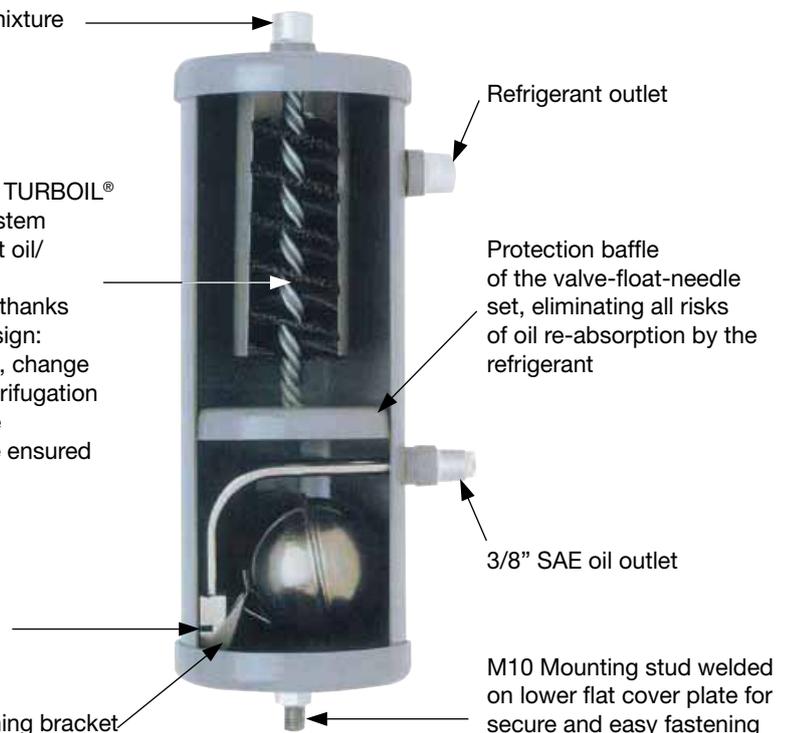
- The efficiency of the oil separation is never 100 %, especially with variable operating regimes. The implementation of an oil separator does not exempt to avoid any trap oil and slopes in the direction of the fluid during the design and the construction of the pipes of the unit.
- A check valve can be installed on the pipe at the gas outlet of the oil separator, in order to avoid any return of liquid refrigerant from the condenser.

Oil / refrigerant mixture feed

CARLY patented TURBOIL® oil separation system ensuring the best oil/refrigerant separation rates thanks to an original design: change of speed, change of direction, centrifugation and coalescence phenomenon are ensured simultaneously

Carbon steel pin to prevent twisting risks

Reinforced retaining bracket



M10 Mounting stud welded on lower flat cover plate for secure and easy fastening



Oil separators

→ TURBOIL® (welded) / TURBOIL-F® (flanged)

■ Example of selection

The sizing of a product implies for the buyer to take into account the conditions under which the product will be used (temperature - pressure - refrigerant - oil - external environment). The values of the selection tables proposed in the CARLY catalogue match accurate test conditions.

We recommend that you convert your operating data into data matching the CARLY selection table so that you can perform a rigorous and correct sizing.

For a condensation temperature different from 38 °C, it is recommended to convert the installation's refrigerating capacity using the following formula:

$$Q_o^{Tk\ 38} = Q_o^{Tk\ x} / \{ (Tk\ x - 38) \times 0,0143 + 1 \}$$

- ⁽¹⁾ $Q_o^{Tk\ x}$ = installation's refrigerating capacity at initial condensation temperature (kW)
- $Tk\ x$ = initial condensation temperature (°C)
- $Q_o^{Tk\ 38}$ = installation's refrigerating capacity at a condensation temperature of 38 °C (kW)

SELECTION OF A TURBOIL® MODEL CORRESPONDING TO THE CORRECTED REFRIGERATING CAPACITY.

• Installation operating with R404A under the following conditions:

- $T_o = -10\ ^\circ C$
- $Tk = 30\ ^\circ C$
- $Q_o^{Tk\ x} = 75\ kW$
- Compressor discharge = 1" 5/8

• Which TURBOIL® to choose?

Application of the formula

$$Q_o^{Tk\ 38} = Q_o^{Tk\ x} / \{ (Tk\ x - 38) \times 0,0143 + 1 \}$$

$$75 / \{ (30 - 38) \times 0,0143 + 1 \} = 85\ kW$$

Refer to the selection table page 41.4

Result:
TURBOIL 8013 S

Make sure that the TURBOIL® oil separator connection diameter is at least equal to the compressor discharge line diameter. The selected oil separator has a connection diameter identical to the piping diameter.



Make sure that the actual differential pressure of operation ΔPf is lower than that of the selected separator (see «technical features» table).

⁽¹⁾ Chapter «Abbreviations and units» (refer to chapter 113).



Oil separators

→ TURBOIL[®] (welded)

■ Selection table

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾												
				R22 R407F			R134a			R404A R507			R407C R410A			R744 ⁽²⁾
				-40 °C	-10 °C	+5 °C	-40 °C	-10 °C	+5 °C	-40 °C	-10 °C	+5 °C	-40 °C	-10 °C	+5 °C	-40 °C
TURBOIL 1503 S	3/8	TURBOIL 1503 MMS	10	5,0	6,0	7,0	3,5	4,5	5,0	5,0	6,0	7,0	5,0	6,0	7,0	10,0
TURBOIL 1504 S	1/2	TURBOIL 1504 MMS	12	6,0	7,0	8,0	4,0	5,0	5,5	6,0	7,0	8,0	6,0	7,0	8,0	12,0
TURBOIL 2505 S/MMS	5/8	TURBOIL 2505 S/MMS	16	17,0	22,0	24,0	12,0	15,0	17,0	17,0	22,0	25,0	16,0	21,0	24,0	27,0
TURBOIL 3006 S	3/4	TURBOIL 3006 MMS	18	20,0	25,0	28,0	16,0	21,0	23,0	22,0	27,0	30,0	21,0	26,0	28,5	42,0
TURBOIL 3007 S/MMS	7/8	TURBOIL 3007 S/MMS	22	24,0	27,0	30,0	18,0	23,0	25,0	26,0	30,0	32,0	25,0	28,5	30,5	54,0
TURBOIL 3009 S	1 1/8	TURBOIL 3009 MMS	28	28,0	32,0	36,0	19,0	25,0	28,0	29,0	36,0	40,0	27,5	34,0	38,0	95,0
TURBOIL 3011 S/MMS	1 3/8	TURBOIL 3011 S/MMS	35	32,0	40,0	45,0	21,0	27,0	31,0	32,0	40,0	47,0	31,0	39,0	43,5	124,0
TURBOIL 6009 S	1 1/8	TURBOIL 6009 MMS	28	42,0	50,0	55,0	34,0	37,0	42,0	42,0	54,0	60,0	41,0	48,0	54,0	95,0
TURBOIL 6011 S/MMS	1 3/8	TURBOIL 6011 S/MMS	35	48,0	55,0	60,0	38,0	46,0	50,0	48,0	60,0	70,0	46,0	57,0	66,5	149,0
TURBOIL 7011 S/MMS	1 3/8	TURBOIL 7011 S/MMS	35	48,0	55,0	60,0	38,0	46,0	50,0	48,0	60,0	70,0	46,0	57,0	66,5	149,0
TURBOIL 8013 S	1 5/8	TURBOIL 8013 MMS	42	65,0	80,0	90,0	45,0	60,0	70,0	65,0	85,0	94,0	62,0	81,0	89,5	210,0
TURBOIL 9017 S/MMS	2 1/8	TURBOIL 9017 S/MMS	54	85,0	100,0	110,0	58,0	70,0	80,0	87,0	105,0	120,0	83,0	100,0	114,0	288,0

⁽¹⁾ The indicated refrigerating capacities take into account a condensation temperature of + 38 °C, a 5 °C sub-refrigeration, and an aspirated gas temperature of + 18 °C.

⁽²⁾ Refrigerating capacity Q_n for T_k = + 0 °C
 For T_k = - 10 °C Q_o = Q_n - 22 %,
 For T_k = - 20 °C Q_o = Q_n - 41 %.

Refer to selection example page 41.3.



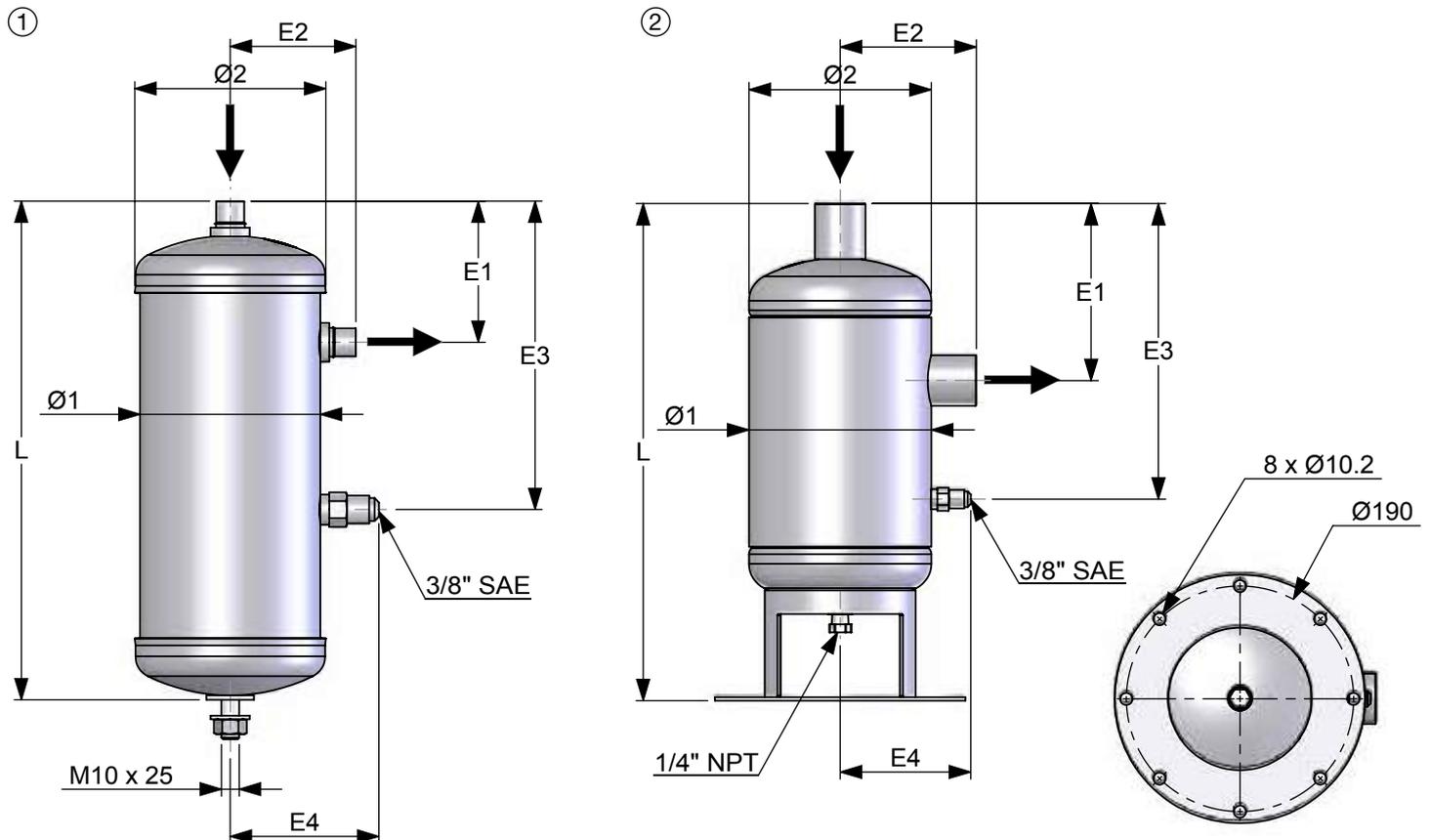
Oil separators

→ TURBOIL® (welded)

■ Technical features

CARLY references	Connections types (1)	Drawing No	Dimensions mm							
			Ø1	Ø2	L	E1	E2	E3	E4	
TURBOIL 1503 S	TURBOIL 1503 MMS	2	1	101,6	109,0	283	80	71	175	84
TURBOIL 1504 S	TURBOIL 1504 MMS	2	1	101,6	109,0	283	80	71	175	84
TURBOIL 2505 S/MMS		2	1	101,6	109,0	305	82	73	197	84
TURBOIL 3006 S	TURBOIL 3006 MMS	2	1	101,6	109,0	308	85	76	200	84
TURBOIL 3007 S/MMS		2	1	101,6	109,0	358	97	83	250	84
TURBOIL 3009 S	TURBOIL 3009 MMS	3	1	101,6	109,0	390	107	80	282	84
TURBOIL 3011 S/MMS		3	1	101,6	109,0	487	116	90	379	84
TURBOIL 6009 S	TURBOIL 6009 MMS	3	1	101,6	109,0	434	107	80	327	84
TURBOIL 6011 S/MMS		3	1	101,6	109,0	549	116	90	441	84
TURBOIL 7011 S/MMS		3	2	152,4	156,0	419	149	114	249	109
TURBOIL 8013 S	TURBOIL 8013 MMS	3	2	152,4	156,0	498	149	114	329	109
TURBOIL 9017 S/MMS		3	2	152,4	156,0	512	162	127	342	109

(1) Chapter «Connection features and drawings» (refer to chapter 114).





Oil separators

→ TURBOIL® (welded)

■ Technical features

CARLY references		Volume		Maximal working pressure	Working pressure ⁽¹⁾	Differential pressure ⁽³⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
		V L	Oil volume V L							
TURBOIL 1503 S	TURBOIL 1503 MMS	1,72	0,30	46	15	29	120	-40	-30	I
TURBOIL 1504 S	TURBOIL 1504 MMS	1,86	0,30	46	15	29	120	-40	-30	I
TURBOIL 2505 S/MMS		1,97	0,30	46	15	29	120	-40	-30	I
TURBOIL 3006 S	TURBOIL 3006 MMS	2,12	0,30	46	15	29	120	-40	-30	I
TURBOIL 3007 S/MMS		2,33	0,30	46	15	29	120	-40	-30	I
TURBOIL 3009 S	TURBOIL 3009 MMS	2,54	0,30	46	15	29	120	-40	-30	I
TURBOIL 3011 S/MMS		3,28	0,30	46	15	29	120	-40	-30	I
TURBOIL 6009 S	TURBOIL 6009 MMS	2,87	0,30	46	15	29	120	-40	-30	I
TURBOIL 6011 S/MMS		3,64	0,30	46	15	29	120	-40	-30	I
TURBOIL 7011 S/MMS		4,16	1,00	46	15	29	120	-40	-30	I
TURBOIL 8013 S	TURBOIL 8013 MMS	5,77	1,00	46	15	19	120	-40	-30	II
TURBOIL 9017 S/MMS		5,83	1,00	46	15	19	120	-40	-30	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

⁽³⁾ Maximum operating differential pressure ΔPf = Discharge pressure - oil return circuit pressure.



Oil separators

→ TURBOIL-F® (flanged)

■ Selection table

CARLY references	Connections To solder ODF pouce	CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾												
				R22 R407F			R134a			R404A R507			R407C R410A			R744 ⁽²⁾
				-40 °C	-10 °C	+5 °C	-40 °C	-10 °C	+5 °C	-40 °C	-10 °C	+5 °C	-40 °C	-10 °C	+5 °C	-40 °C
TURBOIL-F 2505 S/MMS	5/8	TURBOIL-F 2505 S/MMS	16	17,0	22,0	24,0	12,0	15,0	17,0	17,0	22,0	25,0	16,0	21,0	24,0	27,0
TURBOIL-F 3007 S/MMS	7/8	TURBOIL-F 3007 S/MMS	22	24,0	27,0	30,0	18,0	23,0	25,0	25,0	30,0	32,0	25,0	28,5	30,5	54,0
TURBOIL-F 3009 S	1 1/8	TURBOIL-F 3009 MMS	28	28,0	32,0	36,0	19,0	25,0	28,0	29,0	36,0	40,0	27,5	34,0	38,0	95,0
TURBOIL-F 3011 S/MMS	1 3/8	TURBOIL-F 3011 S/MMS	35	32,0	40,0	45,0	21,0	27,0	31,0	32,0	40,0	47,0	31,0	39,0	43,5	124,0
TURBOIL-F 7011 S/MMS	1 3/8	TURBOIL-F 7011 S/MMS	35	48,0	55,0	60,0	38,0	46,0	50,0	48,0	60,0	70,0	46,0	57,0	66,5	149,0
TURBOIL-F 8013 S	1 5/8	TURBOIL-F 8013 MMS	42	65,0	80,0	90,0	45,0	60,0	70,0	65,0	85,0	94,0	62,0	81,0	89,5	210,0
TURBOIL-F 9017 S/MMS	2 1/8	TURBOIL-F 9017 S/MMS	54	85,0	100,0	110,0	58,0	70,0	80,0	87,0	105,0	120,0	83,0	100,0	114,0	288,0
TURBOIL-F 15013 S	1 5/8	TURBOIL-F 15013 MMS	42	104,0	128,0	145,0	78,0	96,0	109,0	105,0	130,0	148,0	100,0	124,0	141,0	328,0
TURBOIL-F 15017 S/MMS	2 1/8	TURBOIL-F 15017 S/MMS	54	121,0	149,0	170,0	91,0	112,0	127,0	125,0	154,0	175,0	119,0	146,5	166,5	367,0
TURBOIL-F 15021 S	2 5/8	TURBOIL-F 15021 MMS	67	138,0	170,0	194,0	104,0	128,0	146,0	142,0	175,0	200,0	135,0	166,5	190,0	565,0
TURBOIL-F 30025 S	3 1/8	TURBOIL-F 30025 MMS	80	303,0	372,0	424,0	228,0	280,0	318,0	310,0	380,0	430,0	295,0	362,0	409,5	643,0

⁽¹⁾ The indicated refrigerating capacities take into account a condensation temperature of + 38 °C, a 5 °C sub-refrigeration, and an aspirated gas temperature of + 18 °C.

⁽²⁾ Refrigerating capacity Qn for Tk = + 0 °C
 For Tk = - 10 °C Qo = Qn - 22 %,
 For Tk = - 20 °C Q0 = Qn - 41 %.

Refer to selection example page 41.3.

■ Float set internal cleaning or replacement procedure

- 1 • Isolate the **TURBOIL-F®** (or the **TURBOIL-RF®**)
- 2 • Purge the isolated circuit until atmospheric pressure is reached in the oil separator.
- 3 • Empty the oil present in the separator, using the 1/4" NPT drain plug located in the lower part of the **TURBOIL-F®**.
- 4 • Remove the bolts and remove the lower part of the **TURBOIL-F®**.
- 5 • Proceed to the cleaning or replacement, if necessary, of this lower part of the separator.
- 6 • Replace systematically the fastening gasket on the lower part of the separator (gasket references on page 41.10) (To select the right reference of the gasket, refer to paragraph spare parts, at the end of the chapter).
- 7 • Put back the lower part of the separator, uniformly and progressively tightening the fastening bolts. (refer to chapter 115 - GENERAL MOUNTING PRECAUTIONS - Criss-cross tightening).

The recommended tightening torques are:

- 30 N.m for TURBOIL-F 2505 S/MMS to 3011 S/MMS
- 55 N.m for TURBOIL-F 7011 S/MMS to 9017 S/MMS
- 30 N.m for TURBOIL-F 15013 S/MMS to 30025 S/MMS

- 8 • Screw back the 1/4" NPT drain plug on the lower part of the separator and make sure it is properly sealed.
- 9 • Evacuate the system and check the tightness of the installation before loading the separator with oil and putting back under pressure.



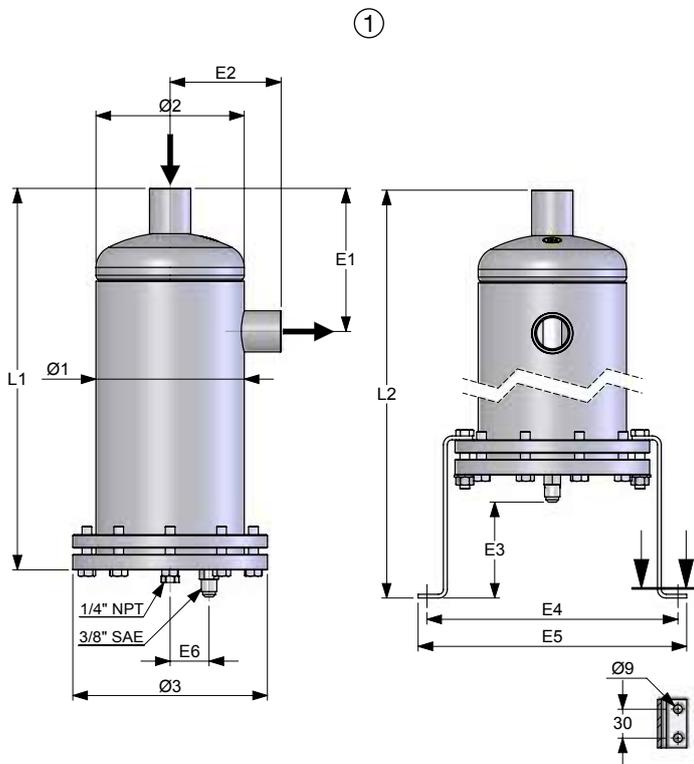
Oil separators

→ TURBOIL-F® (flanged)

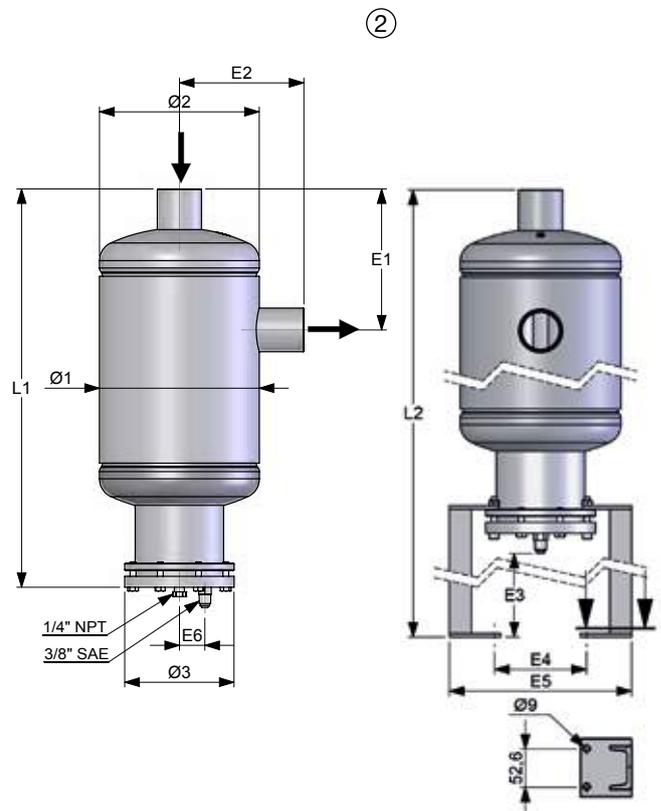
■ Technical features

CARLY references	Connections types (1)	Drawing N°	Dimensions mm											
			Ø1	Ø2	Ø3	L1	L2	E1	E2	E3	E4	E5	E6	
TURBOIL-F 2505 S/MMS	2	1	101,6	109	140	303	441	82	73	111	204	222	35	
TURBOIL-F 3007 S/MMS	2	1	101,6	109	140	355	494	102	83	111	204	222	35	
TURBOIL-F 3009 S	TURBOIL-F 3009 MMS	3	1	101,6	109	140	387	526	107	88	111	204	222	35
TURBOIL-F 3011 S/MMS		3	1	101,6	109	140	485	623	116	90	111	204	222	35
TURBOIL-F 7011 S/MMS		3	1	152,4	156	200	395	523	148	114	104	258	276	40
TURBOIL-F 8013 S	TURBOIL-F 8013 MMS	3	1	152,4	156	200	428	555	148	114	104	258	276	40
TURBOIL-F 9017 S/MMS		3	1	152,4	156	200	441	569	161	127	104	258	276	40
TURBOIL-F 15013 S	TURBOIL-F 15013 MMS	3	2	219,1	224	150	492	821	174	149	305	126	249	35
TURBOIL-F 15017 S/MMS		3	2	219,1	224	150	550	879	195	171	305	126	249	35
TURBOIL-F 15021 S	TURBOIL-F 15021 MMS	3	2	219,1	224	150	565	894	215	184	305	126	249	35
TURBOIL-F 30025 S	TURBOIL-F 30025 MMS	3	2	219,1	224	150	577	906	234	185	305	126	249	35

(1) Chapter «Connection features and drawings» (refer to chapter 114).



1 set of 2 supporting feet
on option
ref. CARLY: CY 37100260



1 set of 2 supporting feet
on option
ref. CARLY: CY 38600220



Oil separators

→ TURBOIL-F[®] (flanged)

■ Technical features

CARLY references	Volume	Oil volume	Maximal working pressure	Working pressure ⁽¹⁾	Differential pressure ⁽³⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾	
	V L	V L	PS bar	PS BT bar	ΔPf bar	TS maxi °C	TS mini °C	TS BT °C		
TURBOIL-F 2505 S/MMS	2,29	0,3	46	15	29	120	-40	-30	I	
TURBOIL-F 3007 S/MMS	2,62	0,3	46	15	29	120	-40	-30	I	
TURBOIL-F 3009 S	TURBOIL-F 3009 MMS	2,82	0,3	46	15	29	120	-40	-30	I
TURBOIL-F 3011 S/MMS		3,56	0,3	46	15	29	120	-40	-30	I
TURBOIL-F 7011 S/MMS		5,00	1,0	33	15	29	120	-40	-30	I
TURBOIL-F 8013 S	TURBOIL-F 8013 MMS	6,00	1,0	33	15	29	120	-40	-30	I
TURBOIL-F 9017 S/MMS		6,00	1,0	33	15	29	120	-40	-30	I
TURBOIL-F 15013 S	TURBOIL-F 15013 MMS	11,50	0,4	45	15	29	120	-40	-30	II
TURBOIL-F 15017 S/MMS		13,20	0,4	45	15	29	120	-40	-30	II
TURBOIL-F 15021 S	TURBOIL-F 15021 MMS	13,40	0,4	45	15	19	120	-40	-30	II
TURBOIL-F 30025 S	TURBOIL-F 30025 MMS	13,50	0,4	45	15	19	120	-40	-30	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

⁽³⁾ Maximum operating differential pressure $\Delta Pf = \text{Discharge pressure} - \text{oil return circuit pressure}$

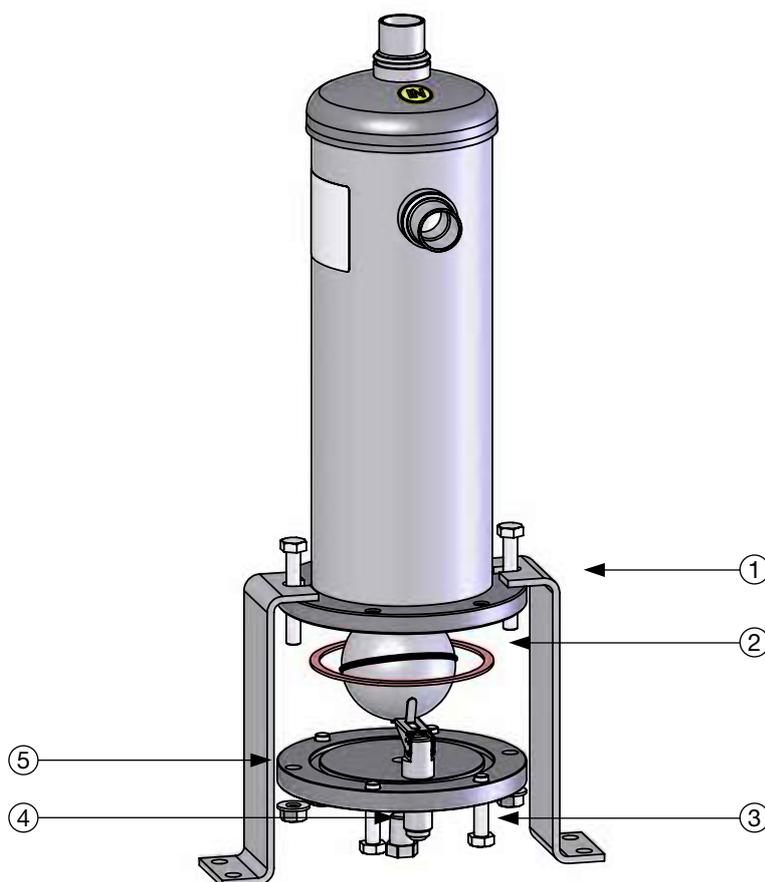


Oil separators

→ TURBOIL-F® (flanged)

■ Spare parts

CARLY references	Part Nb	Description	TURBOIL-F® Types	Quantity
CY 37100250	1	1 set of 2 supporting feet	2505 S/MMS to 3011 S/MMS (Before 2010)	1
CY 37100260	1	1 set of 2 supporting feet	2505 S/MMS à 9017 S/MMS	1
CY 37100300	1	1 set of 2 supporting feet	7011 S/MMS to 9017 S/MMS (Before 2010)	1
CY 38600220	1	1 set of 2 supporting feet	15013 S/MMS to 30025 S/MMS	1
CY 15555301	2	Flat gasket for flange closure	2505 S/MMS to 3011 S/MMS	1
CY 15555304	2	Flat gasket for flange closure	7011 S/MMS to 9017 S/MMS	1
CY 15555303	2	Flat gasket for flange closure	15013 S/MMS to 30025 S/MMS	1
CY 19900420	3	Set of 8 screws for flange closure	15013 S/MMS to 30025 S/MMS	1
CY 19900425	3	Set of 6 screws for flange closure	2505 S/MMS to 3011 S/MMS	1
CY 19900520	3	Set of 10 screws for flange closure	7011 S/MMS to 9017 S/MMS	1
CY 10810010	4	1/4" NPT drain plug	2505 S/MMS to 3011 S/MMS 7011 S/MMS to 30025 S/MMS	1
CY 33303450	5	Flange with gasket and float set	15021 S/MMS to 30025 S/MMS	1
CY 33402000	5	Lower part of separator with gasket and float set	2505 S/MMS to 3011 S/MMS (Before 2010)	1
CY 33403000	5	Lower part of separator with gasket and float set	7011 S/MMS to 9017 S/MMS (Before 2010)	1
CY 33800516	5	Flange with gasket and float set	2505 S/MMS à 3011 S/MMS	1
CY 33800456	5	Flange with gasket and float set	7011 S/MMS à 9017 S/MMS	1
CY 33801706	5	Flange with gasket and float set	15013 S/MMS to 15017 S/MMS	1





Oil separators

→ TURBOIL® (welded) / TURBOIL-F® (flanged)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TURBOIL 1503 S & MMS	2,90	2,65	1
TURBOIL 1504 S & MMS	3,35	3,10	1
TURBOIL 2505 S/MMS	3,55	3,25	1
TURBOIL 3006 S & MMS	3,75	3,45	1
TURBOIL 3007 S/MMS	4,20	3,90	1
TURBOIL 3009 S & MMS	4,25	3,95	1
TURBOIL 3011 S/MMS	5,55	5,20	1
TURBOIL 6009 S & MMS	4,90	4,55	1
TURBOIL 6011 S/MMS	6,25	5,90	1
TURBOIL 7011 S/MMS	8,50	8,10	1
TURBOIL 8013 S & MMS	10,80	10,40	1
TURBOIL 9017 S/MMS	11,35	10,95	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TURBOIL-F 2505 S/MMS	5,25	4,95	1
TURBOIL-F 3007 S/MMS	5,60	5,30	1
TURBOIL-F 3009 S & MMS	6,10	5,75	1
TURBOIL-F 3011 S/MMS	7,20	6,85	1
TURBOIL-F 7011 S/MMS	12,10	11,70	1
TURBOIL-F 8013 S & MMS	14,35	13,95	1
TURBOIL-F 9017 S/MMS	15,90	15,50	1
TURBOIL-F 15013 S & MMS	19,05	17,85	1
TURBOIL-F 15017 S/MMS	22,15	20,95	1
TURBOIL-F 15021 S & MMS	22,85	21,65	1
TURBOIL-F 30025 S & MMS	23,95	22,75	1

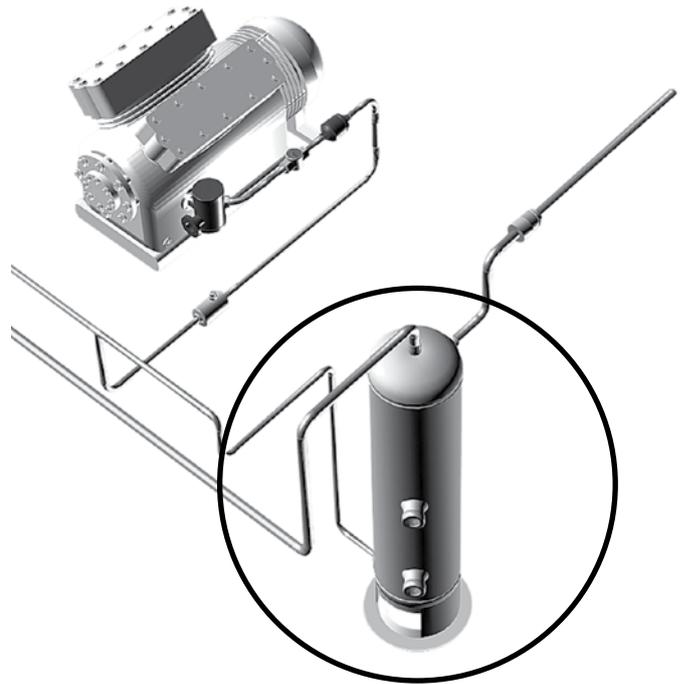


Oil separators

→ TURBOIL-R®

■ Applications

- Separation and recovery of the oil carried by the refrigerant in vapour phase at compressor outlet of refrigerating and air conditioning installations.
- The TURBOIL-R® oil separators receiver limit the amount of oil within the circuit, thus allowing increasing the performances of the heat exchangers and prevent abnormal wear, even the breakage of compressors by lack of oil.
- They must be used in applications where the return of oil through the suction is not guaranteed: facilities with long pipes, oil traps, with evaporation temperatures lower than - 5 °C, with compressors in parallel, or with variable speed, for systems with multiple compressor stages in cascade, Flood, Booster...
- They ensure a regulated oil return to the compressor crankcases and participate by their position on the circuit, in the reduction of the vibrations generated by the compressors and sound level of the discharge gas.
- The choice of the oil separators receivers TURBOIL-R® avoids the assembly of a separate oil receiver.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is done with the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- The oil receiver function is ensured by a built-in receiver
- High pressure oil outlet by a 3/8" SAE Rotalock stop valve
- The TURBOIL-R® do not have any internal oil regulation system (float, valve and needle)
- Models with a 4 litres oil reserve and more, have built-in fastening means



Customization possible on demand:

- Separator with oil return by capillary (onboard refrigeration)
- Centrifugal separator
- Receiver volume, connections, etc...

■ CARLY advantages

- Maximum working pressure: 46 bar.
- Very important simplification and cost reduction compared with a traditional oil system:
 - drastic reduction of piping lengths and number of components
 - important reduction of mounting time
 - limitation of machine footprint
 - suppression of the differential valve joining the oil receiver and the suction line
 - limitation of the risk of leak thanks to the simplification of the oil return system.
- Fitted with the efficient TURBOIL® oil separation system.
- Low pressure drop compare to a separator using coalescent cores.
- Do not need specific maintenance operations, because there is no cores to be replace periodically.
- Presence of two sight glasses with colour balls on the receiver part, for a better reading of the oil level.
- Very large range.
- GOST certified products.



Oil separators

→ TURBOIL-R®

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

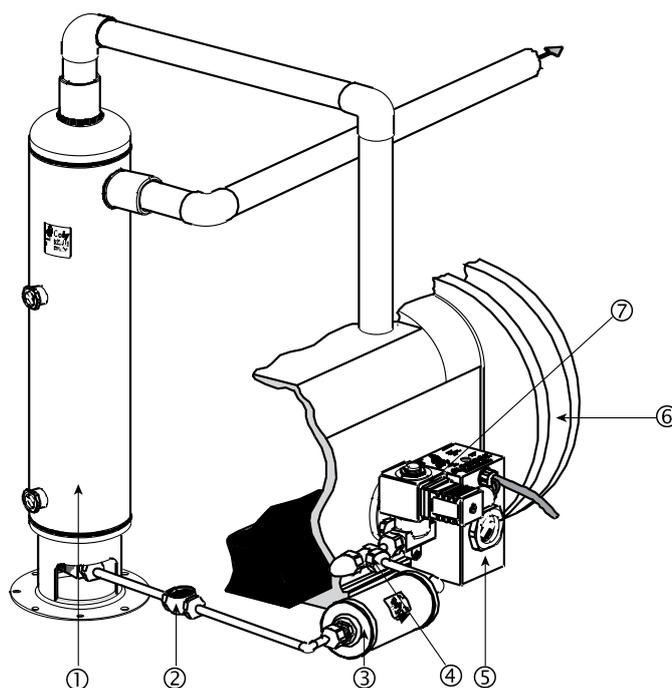
■ Recommendations specific to the oil separators receivers TURBOIL-R

- The recommendations are identical to those given for the TURBOIL® oil separators (refer to chapter 41)
- Given the high pressure at the oil outlet of the TURBOIL-R®, the use of mechanical oil regulator LEVOIL is not possible; it is therefore recommended to use an electronic oil regulator.
- In the case of multi-compressors installation, CARLY recommends the use of one TURBOIL-R® by compressor.
- Connection diameter of the oil separators should be higher than or equal to the diameter of the discharge line.
- Upon commissioning of a new installation, fill the TURBOIL-R® receiver part with oil identical to the one used in the compressors, up to half the upper sight glass, corresponding to the volume of oil V2 in the Technical features table (refer to next pages).
- During the first two days of operation of the installation, carefully monitor the oil level in the separator receiver and keep it at half the higher sight glass; then, no extra oil shall be added, as long as the level does not go below half the lower sight glass.
- In the case of an installation that is already operating, the oil should be added very carefully. Reintegration of the oil distributed until then in the installation must, after the first day of operation, be sufficient to fill the TURBOIL-R® receiver part and reach the upper sight glass. If the oil level has not reached the upper sight glass, then the necessary quantity of oil should be added. But, if the oil level is higher than the upper sight glass, it is imperative to empty the surplus; this operation is possible via the oil separator receiver's lower valve.

- Systematically use the same oil as that of the compressor.
- The efficiency of the oil separation is never 100 %, especially with variable operating regimes. The implementation of an oil separator does not exempt to avoid any trap oil and slopes in the direction of the fluid during the design and the construction of the pipes of the unit.
- A check valve can be installed on the pipe at the gas outlet of the oil separator,

in order to avoid any return of liquid refrigerant from the condenser.

- The O-ring gasket should be replaced after each removal of the sight glass; screw it back complying with the recommended 25 N.m tightening torque.
- The PTFE gasket of the Rotalock valve must be replaced after each disassembly; the recommended tightening torque is 25 N.m.



- ① TURBOIL-R® oil separator receiver
- ② HCYP oil sight glass
- ③ HYDROIL filter drier for POE oil
- ④ HCYVI shut-off valve

- ⑤ Electronic oil level regulator
- ⑥ Compressor
- ⑦ Solenoid valve



Oil separators

→ TURBOIL-R®

■ Example of selection

An oil separator receiver is selected in two stages: a first stage sets the size of the oil separator and its connections, and a second stage determines the volume of the oil receiver part, all bases on the installation's operation parameters (refrigerating capacity, evaporation and condensation temperatures, type of refrigerant, number and type of compressors ...).

1 - Selection by capacity

The sizing of a product implies for the buyer to take into account the conditions under which the product will operate (temperature, pressure, refrigerant, oil, external environment). The values of the selection tables proposed in the CARLY catalogue match accurate test conditions.

We recommend that you convert your operating data into data matching the CARLY selection table so that you can perform a rigorous and correct sizing.

For a condensation temperature different from 38°C, it is recommended to convert the installation's refrigerating capacity using the following formula:

$$Q_{O}^{TK\ 38} = Q_{O}^{TK\ x} / \{ (TKx - 38) \times 0,0143 + 1 \}$$

- ⁽¹⁾ $Q_{O}^{TK\ x}$ = installation refrigerating capacity at initial condensing temperature (kW)
- $TK\ x$ = initial condensing temperature (°C)
- $Q_{O}^{TK\ 38}$ = installation refrigerating capacity at condensing temperature 38 °C (kW)

SELECTION OF A TURBOIL-R® MODEL CORRESPONDING TO THE CORRECTED REFRIGERATING CAPACITY

• Installation operating with R404A under the following conditions:

- $T_o = -10\ ^\circ\text{C}$
- $TK = 30\ ^\circ\text{C}$
- $Q_{O}^{TK\ x} = 75\ \text{kW}$
- Compressor discharge = 1" 5/8

• Which TURBOIL® to choose?

Application of the formula:

$$Q_{O}^{TK\ 38} = Q_{O}^{TK\ x} / \{ (TKx - 38) \times 0,0143 + 1 \}$$

$$75 / \{ (30 - 38) \times 0,0143 + 1 \} = 85\ \text{kW}$$

Refer to the selection table next page

Result:

TURBOIL-R® 48013 S or 78013 S or 128013 S,

o select according to the chosen volume of the oil reserve (4, 7 or 12 litres).

Choice of the volume of the oil reserve: see chapter hereafter.

Make sure that the TURBOIL-R® oil separator connection diameter is at least equal to the compressor discharge line diameter. The selected oil separator has a connection diameter identical to the piping diameter.

⁽¹⁾ Chapter «Abbreviations and units» (refer to chapter 113).



Oil separators

→ TURBOIL-R®

■ Exemple de sélection donné à titre indicatif

2 - Selection of the necessary volume of the oil receiver

The volume of the oil receiver depends on the number of compressors, their oil load, the application and the operating conditions.

Example: for a single stage installation with 3 compressors mounted in parallel, which have the following theoretical swept volumes (Vmb):

- Vmb1 = 24 m³/h
- Vmb2 = 24 m³/h
- Vmb3 = 18 m³/h

Number of compressors : Nc = 3

Average swept volume : $(24 + 24 + 18) / 3 = 22 \text{ m}^3/\text{h}$

Refer to the selection table above, which gives an oil receiver volume of 7,7-7,8 litres

Result:

TURBOIL-R 78013 S for 85 kW, with a volume of oil receiver of 7,7 litres

Volume of the oil reserve							
2,3 - 2,5 L		4,3 L		7,7 - 7,8 L		11,7 - 12,7 L	
Nc ⁽¹⁾	Vmb ⁽²⁾	Nc	Vmb	Nc	Vmb	Nc	Vmb
1	0 - 40	1	4 - 60	1	60 - 120	1	120 - 280
2	0 - 20	2	4 - 30	2	30 - 60	2	60 - 140
3	0 - 14	3	4 - 20	3	20 - 40	3	40 - 95
				4	15 - 30	4	30 - 70
						5	25 - 55
						6	20 - 45

⁽¹⁾ Nc : Number of compressors

⁽²⁾ Vmb : Average swept volume per each compressor; $Vmb = (Vmb1 + Vmb2 + \dots + VmbN) / Nc \text{ en m}^3/\text{h}$

In the case of bi-stage systems, for the selection of the oil receiver, only take into account the swept volume of the first stage compressors. In the case of an application with long pipes or with several machines, do not hesitate to over-size the receiver and, if any doubt, contact the CARLY technical service.



Oil separators

➔ TURBOIL-R®

■ Selection table

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Refrigerating capacity kW ⁽¹⁾												
				R22			R134a			R404A R507			R407C R410A			R744 ⁽²⁾
				-40 °C	-10 °C	+5 °C	-40 °C	-10 °C	+5 °C	-40 °C	-10 °C	+5 °C	-40 °C	-10 °C	+5 °C	-30 °C
TURBOIL-R 22505 S/MMS	5/8	TURBOIL-R 22505 S/MMS	16	17	22	24	12	15	17	17	22	25	16	21	24	27
TURBOIL-R 23007 S/MMS	7/8	TURBOIL-R 23007 S/MMS	22	24	27	30	18	23	25	26	30	32	25	29	31	54
TURBOIL-R 23009 S	1 1/8	TURBOIL-R 23009 MMS	28	28	32	36	19	25	28	29	36	40	28	34	38	95
TURBOIL-R 23011 S/MMS	1 3/8	TURBOIL-R 23011 S/MMS	35	32	40	45	21	27	31	32	40	47	31	38	45	124
TURBOIL-R 47009 S	1 1/8	TURBOIL-R 47009 MMS	28	42	50	55	34	37	42	42	54	60	41	48	54	95
TURBOIL-R 47011 S/MMS	1 3/8	TURBOIL-R 47011 S/MMS	35	48	55	60	38	46	50	48	60	70	46	57	67	149
TURBOIL-R 48013 S	1 5/8	TURBOIL-R 48013 MMS	42	65	80	90	45	60	70	65	85	94	62	81	90	210
TURBOIL-R 49017 S/MMS	2 1/8	TURBOIL-R 49017 S/MMS	54	85	100	110	58	70	80	87	105	120	83	100	114	288
TURBOIL-R 77011 S/MMS	1 3/8	TURBOIL-R 77011 S/MMS	35	48	55	60	38	46	50	48	60	70	46	57	67	149
TURBOIL-R 78013 S	1 5/8	TURBOIL-R 78013 MMS	42	65	80	90	45	60	70	65	85	94	62	81	90	210
TURBOIL-R 79017 S/MMS	2 1/8	TURBOIL-R 79017 S/MMS	54	85	100	110	58	70	80	87	105	120	83	100	114	288
TURBOIL-R 127011 S/MMS	1 3/8	TURBOIL-R 127011 S/MMS	35	48	55	60	38	46	50	48	60	70	46	57	67	149
TURBOIL-R 128013 S	1 5/8	TURBOIL-R 128013 MMS	42	65	80	90	45	60	70	65	85	94	62	81	90	210
TURBOIL-R 129017 S/MMS	2 1/8	TURBOIL-R 129017 S/MMS	54	85	100	110	58	70	80	87	105	120	83	100	114	288
TURBOIL-R 815017 S/MMS	2 1/8	TURBOIL-R 815017 S/MMS	54	121	149	170	91	112	127	125	154	175	119	147	167	367
TURBOIL-R 815021 S	2 5/8	TURBOIL-R 815021 MMS	67	138	170	194	104	128	146	142	175	200	135	167	190	565
TURBOIL-R 830025 S	3 1/8	TURBOIL-R 830025 MMS	80	303	372	424	228	280	318	310	380	430	295	362	410	643
TURBOIL-R 1217 S/MMS	2 1/8	TURBOIL-R 1217 S/MMS	54	121	149	170	91	112	127	125	154	175	119	147	167	367
TURBOIL-R 1221 S	2 5/8	TURBOIL-R 1221 MMS	67	138	170	194	104	128	146	142	175	200	135	167	190	565
TURBOIL-R 1225 S	3 1/8	TURBOIL-R 1225 MMS	80	303	372	424	228	280	318	310	380	430	295	362	410	643

⁽¹⁾ The indicated refrigerating capacities take into account a condensation temperature of + 38 °C, a 5 °C subcooling, and an aspirated gas temperature of + 18 °C.

⁽²⁾ The indicated refrigerating capacities take into account a condensation temperature T_k of 0 °C, an evaporating temperature T_0 of - 40 °C, a liquid subcooling of 2K and a suction gaz temperature of - 30 °C.

Refer to selection example page 42.3.



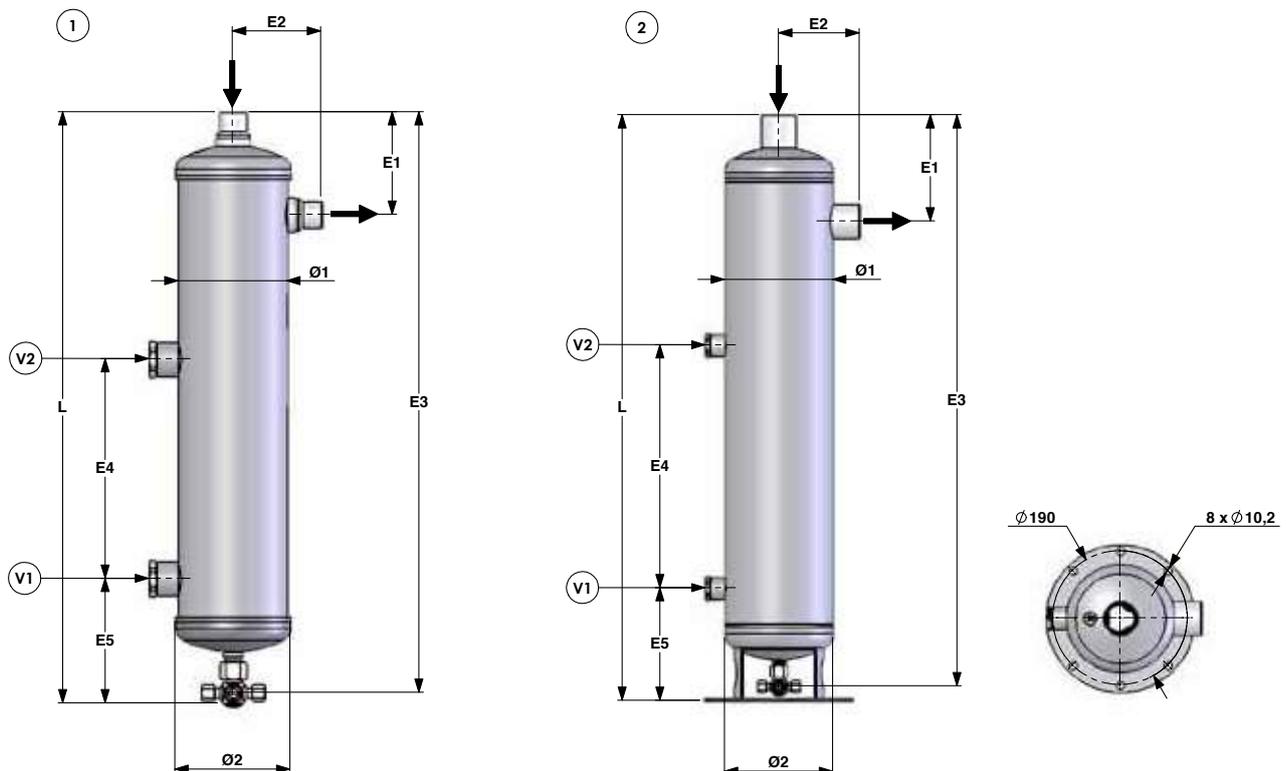
Oil separators

→ TURBOIL-R®

■ Technical features

CARLY references	Connections types ⁽¹⁾	Drawing No	Dimensions mm								
			Ø1	Ø2	L	E1	E2	E3	E4	E5	
TURBOIL-R 22505 S/MMS	2	1	101,6	109	548	82	73	538	207	117	
TURBOIL-R 23007 S/MMS	2	1	101,6	109	558	97	83	548	207	117	
TURBOIL-R 23009 S	TURBOIL-R 23009 MMS	3	1	101,6	109	623	107	80	613	207	117
TURBOIL-R 23011 S/MMS		3	1	101,6	109	632	116	90	622	207	117
TURBOIL-R 47009 S	TURBOIL-R 47009 MMS	3	2	152,4	156	566	141	113	526	150	180
TURBOIL-R 47011 S/MMS		3	2	152,4	156	576	151	114	536	150	180
TURBOIL-R 48013 S	TURBOIL-R 48013 MMS	3	2	152,4	156	655	151	114	615	150	180
TURBOIL-R 49017 S/MMS		3	2	152,4	156	669	164	128	629	150	180
TURBOIL-R 77011 S/MMS		3	2	152,4	156	775	151	114	735	345	180
TURBOIL-R 78013 S	TURBOIL-R 78013 MMS	3	2	152,4	156	851	151	114	811	345	180
TURBOIL-R 79017 S/MMS		3	2	152,4	156	865	164	128	825	345	180
TURBOIL-R 127011 S/MMS		3	2	152,4	156	1076	151	114	1036	650	180
TURBOIL-R 128013 S	TURBOIL-R 128013 MMS	3	2	152,4	156	1155	151	114	1115	650	180
TURBOIL-R 129017 S/MMS		3	2	152,4	156	1169	164	128	1129	650	180
TURBOIL-R 815017 S/MMS		3	2	219,1	224	682	195	171	636	90	202
TURBOIL-R 815021 S	TURBOIL-R 815021 MMS	3	2	219,1	224	695	215	185	649	90	202
TURBOIL-R 830025 S	TURBOIL-R 830025 MMS	3	2	219,1	224	709	230	185	664	90	202
TURBOIL-R 1217 S/MMS		3	2	219,1	224	792	195	171	744	205	202
TURBOIL-R 1221 S	TURBOIL-R 1221 MMS	3	2	219,1	224	805	215	185	757	205	202
TURBOIL-R 1225 S	TURBOIL-R 1225 MMS	3	2	219,1	224	819	230	185	772	205	202

⁽¹⁾ Chapter «Connection features and drawings» (refer to chapter 114).





Oil separators

→ TURBOIL-R®

■ Technical features

CARLY references	Volume	Volume of the receiver	Volume ⁽³⁾		Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾	
			V1	V2							PS bar
TURBOIL-R 22505 S/MMS	3,5	2,3	0,5	2,0	46	15	120	-40	-30	I	
TURBOIL-R 23007 S/MMS	3,5	2,3	0,5	2,0	46	15	120	-40	-30	I	
TURBOIL-R 23009 S	TURBOIL-R 23009 MMS	3,9	2,5	0,5	2,0	46	15	120	-40	-30	I
TURBOIL-R 23011 S/MMS		3,9	2,5	0,5	2,0	46	15	120	-40	-30	I
TURBOIL-R 47009 S	TURBOIL-R 47009 MMS	7,2	4,3	1,4	3,8	46	15	120	-40	-30	II
TURBOIL-R 47011 S/MMS		7,2	4,3	1,4	3,8	46	15	120	-40	-30	II
TURBOIL-R 48013 S	TURBOIL-R 48013 MMS	8,5	4,3	1,4	3,8	46	15	120	-40	-30	II
TURBOIL-R 49017 S/MMS		8,5	4,3	1,4	3,8	46	15	120	-40	-30	II
TURBOIL-R 77011 S/MMS		10,5	7,7	1,4	7,0	46	15	120	-40	-30	II
TURBOIL-R 78013 S	TURBOIL-R 78013 MMS	11,8	7,7	1,4	7,0	46	15	120	-40	-30	II
TURBOIL-R 79017 S/MMS		11,8	7,7	1,4	7,0	46	15	120	-40	-30	II
TURBOIL-R 127011 S/MMS		15,5	12,7	1,4	11,9	46	15	120	-40	-30	II
TURBOIL-R 128013 S	TURBOIL-R 128013 MMS	16,9	12,7	1,4	11,9	46	15	120	-40	-30	II
TURBOIL-R 129017 S/MMS		16,9	12,7	1,4	11,9	46	15	120	-40	-30	II
TURBOIL-R 815017 S/MMS		16,9	7,8	3,1	6,2	45	15	120	-40	-30	II
TURBOIL-R 815021 S	TURBOIL-R 815021 MMS	17,0	7,8	3,1	6,2	45	15	120	-40	-30	II
TURBOIL-R 830025 S	TURBOIL-R 830025 MMS	17,0	7,8	3,1	6,2	45	15	120	-40	-30	II
TURBOIL-R 1217 S/MMS		21,4	11,7	3,1	10,1	45	15	120	-40	-30	II
TURBOIL-R 1221 S	TURBOIL-R 1221 MMS	21,5	11,7	3,1	10,1	45	15	120	-40	-30	II
TURBOIL-R 1225 S	TURBOIL-R 1225 MMS	21,7	11,7	3,1	10,1	45	15	120	-40	-30	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

⁽³⁾ Volume corresponding to sight glasses' level V1 and V2.



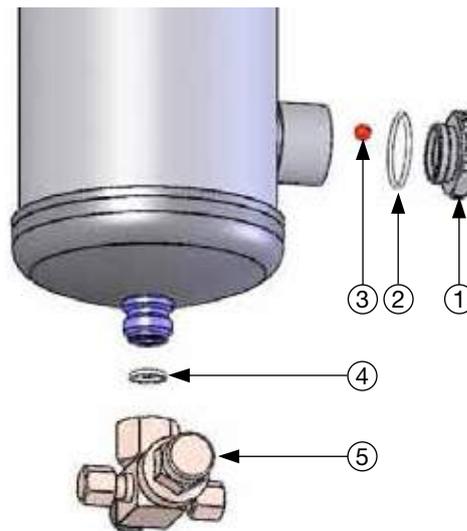
CTCY-EN – 42.1-6 / 07-2015

Oil separators

→ TURBOIL-R®

■ Spare parts

CARLY references		Part N°	Description	Quantity
Oil separator receivers	Spare parts			
Complete range TURBOIL-R	CY 35012150	1	Glass without moisture indicator	1
Complete range TURBOIL-R	CY 15552180	2	O-ring PTFE gasket for sight glass	1
Complete range TURBOIL-R	CY 10501000	3	Colour ball for sight glass	1
Complete range TURBOIL-R	CY 15580100	4	Gasket for 3/8" SAE Rotalock valve	1
Complete range TURBOIL-R	CY 19700100	5	3/8" SAE Rotalock valve with gasket	1





Oil separators

→ TURBOIL-R®

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TURBOIL-R 22505 S/MMS	8,20	7,60	1
TURBOIL-R 23007 S/MMS	8,30	7,70	1
TURBOIL-R 23009 S & MMS	8,70	8,10	1
TURBOIL-R 23011 S/MMS	8,80	8,20	1
TURBOIL-R 47009 S & MMS	11,20	10,60	1
TURBOIL-R 47011 S/MMS	11,40	10,80	1
TURBOIL-R 48013 S & MMS	14,80	14,20	1
TURBOIL-R 49017 S/MMS	14,90	14,30	1
TURBOIL-R 77011 S/MMS	14,30	13,70	1
TURBOIL-R 78013 S & MMS	17,40	16,80	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TURBOIL-R 79017 S/MMS	17,50	16,90	1
TURBOIL-R 127011 S/MMS	19,00	18,40	1
TURBOIL-R 128013 S & MMS	22,20	21,60	1
TURBOIL-R 129017 S/MMS	22,20	21,60	1
TURBOIL-R 815017 S/MMS	25,40	23,20	1
TURBOIL-R 815021 S & MMS	26,20	24,10	1
TURBOIL-R 830025 S & MMS	26,80	24,60	1
TURBOIL-R 1217 S/MMS	27,00	26,40	1
TURBOIL-R 1221 S & MMS	27,70	27,10	1
TURBOIL-R 1225 S & MMS	28,80	28,20	1

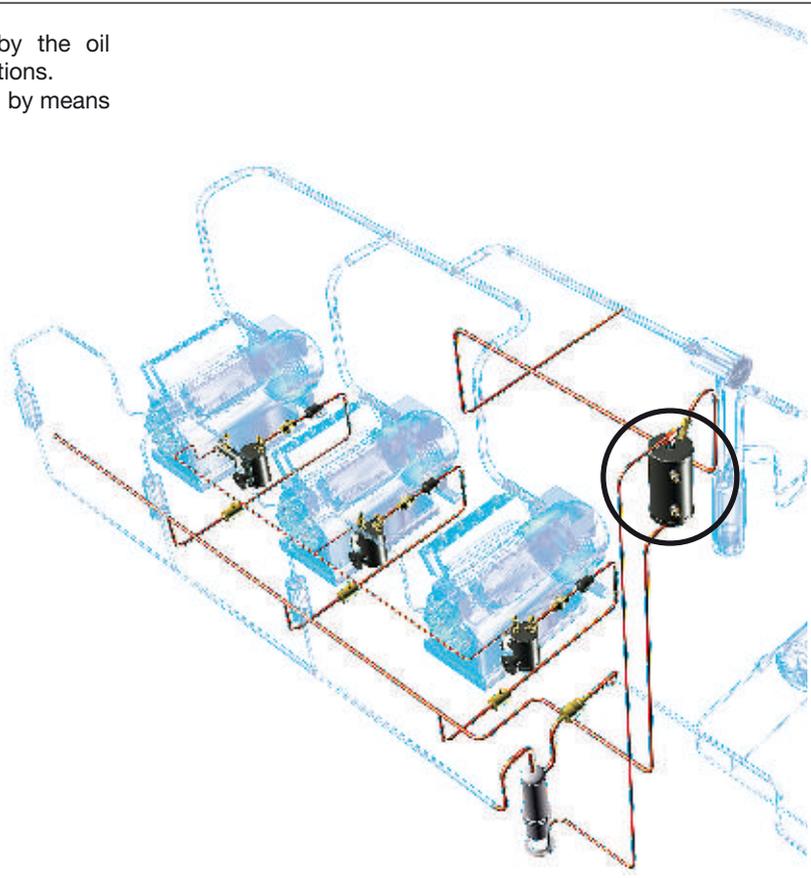


Oil receivers

→ HCYR

■ Applications

- Storage of the oil separated from the refrigerant by the oil separator(s) of refrigerating and air conditioning installations.
- This oil is then re-distributed to the compressor sumps, by means of LEVOIL mechanical or electronic oil level regulators.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- The oil receivers constitute an intermediary expansion volume between the oil separator and the compressor crankcases; thus they eliminate all risks of major refrigerant “trapping” in the oil regulation system and allow immediate compensation of the compressor oil carry-over variations.
- High and low lateral fastenings by angle brackets with holes.

■ CARLY advantages

- Maximum working pressure: up to 46 bar.
- Oil return in high pressure possible.
- Inlet and outlet equipped with ROTALOCK valves, with pressure tap.
- Presence of a 3/8” SAE connection in the upper part, for recommended mounting of a differential relief valve type HCYCT or HCYCTR.
- Presence of two sight glasses with colourful level ball, allowing visualization of the quantity of oil stored in the receiver and detection of any malfunction within the oil circuit.
- Very large range of oil receivers: from 4 to 30 litres.
- GOST certified products.



Oil receivers

→ HCYR

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the oil receivers HCYR

- The oil receivers are to be mounted in vertical position, between the oil separators and the oil level regulators connected to the compressor crankcases.
- An overpressure between the oil receivers and the compressors crankcases facilitates oil return in the latter; this overpressure can be obtained:
 - by installing the oil receivers above the oil level regulators (minimum height of 2 m recommended) or
 - by connecting the oil receiver to the circuit's suction line, using the 3/8" SAE upper connection, equipped with a differential relief valve type HCYCT or HCYCTR.
- Upon commissioning of a new installation, fill the receiver with oil identical to the one used in the compressors, up to half the upper sight glass, corresponding to the

volume of oil V2 in the Technical features table (refer to next page).

- During the first two days of operation of the installation, carefully monitor the oil level in the receiver and keep it at half the higher sight glass; the addition of oil is possible through the oil receiver's upper valve. **Then, no extra oil shall be added, as long as the level does not go below half the lower sight glass.**
- In the case of an installation that is already operating, the oil should be added very carefully. Reintegration of the oil distributed until then in the installation must, after the first day of operation, be sufficient to fill the receiver and reach the upper sight glass. If the oil level has not reached the upper sight glass, then the necessary quantity of oil should be

added. But, if the oil level is higher than the upper sight glass, it is imperative to empty the surplus; this operation is possible via the oil receiver's lower valve.

- Systematically use oil identical to that in the compressor.
- The O-ring should be replaced after each removal of the sight glass; screw it back complying with the recommended 25 N.m tightening torque.
- In order to avoid migration and condensation of the refrigerant which may be present inside the oil receiver, it is advisable to provide a heat supply in the lower part of the oil receiver (heating collar, immersion tube heater, hot fluid coil, etc ...).



Oil receivers

→ HCYR

■ Selection table

CARLY references											
HCYR 40 3,9 L		HCYR 80 - 81 7,4 L		HCYR 120 - 121 12 L		HCYR 150 15 L		HCYR 200 20 L		HCYR 300 30 L	
Nc ⁽¹⁾	Vmb ⁽²⁾	Nc	Vmb	Nc	Vmb	Nc	Vmb	Nc	Vmb	Nc	Vmb
2	4 - 30	2	30 - 60	2	60 - 140	2	100 - 190	2	140 - 240	2	240 - 340
3	4 - 20	3	20 - 40	3	40 - 95	3	65 - 125	3	95 - 160	3	160 - 230
		4	15 - 30	4	30 - 70	4	50 - 95	4	70 - 120	4	120 - 170
				6	20 - 45	6	35 - 60	6	45 - 80	6	80 - 125
				8	15 - 35	8	25 - 45	8	35 - 60	8	60 - 85

⁽¹⁾ Nc: Number of compressors.

⁽²⁾ Vmb: Average volume processed by each compressor; $Vmb = (Vmb1 + Vmb2 + \dots + VmbN) / Nc$ in m³/hr.

■ Example of selection

Exemple

For a single stage installation with 3 compressors mounted in parallel, which have the following theoretical swept volumes (Vmb):

- Vmb1 = 24 m³/h
- Vmb2 = 24 m³/h
- Vmb3 = 18 m³/h
- Number of compressors: Nc = 3

- Average swept volume = $(24 + 24 + 18) / 3 = 22$ m³/h
- Refer to the selection table above, which gives a **HCYR 80 (7,4 litres) or HCYR 81 (7,7 litres)**

In the case of bi-stage systems, for the selection of the oil receiver HCYR, only take into account the swept volume of the first stage compressors.

In the case of an application with long pipes or with several machines, do not hesitate to over-size the receiver and, if any doubt, contact the CARLY technical service.

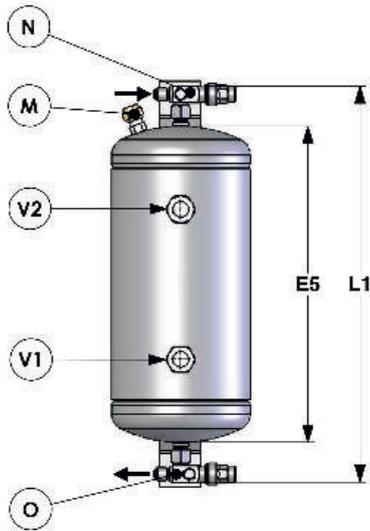
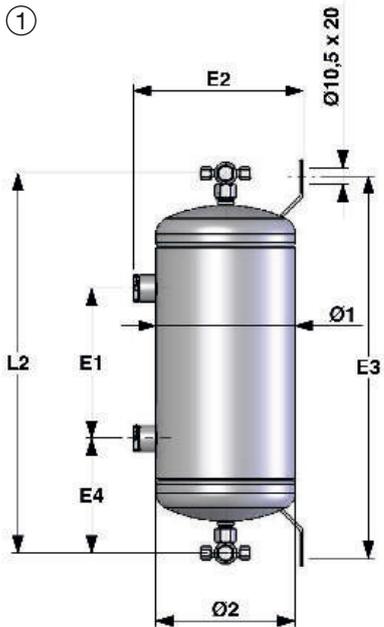


Oil receivers

→ HCYR

■ Technical features

CARLY references	Drawing Nb	Dimensions mm											
		Ø1	Ø2	L1	L2	E1	E2	E3	E4	E5	E6	E7	E8
HCYR 40	1	121,0	128	476	456	180	157	461	138	377	/	/	/
HCYR 80	1	152,4	156	584	564	280	190	557	142	485	/	/	/
HCYR 81	1	168,3	172	479	459	183	205	450	138	380	/	/	/
HCYR 120	1	152,4	156	824	804	435	190	798	185	726	/	/	/
HCYR 121	1	168,3	172	660	640	277	205	631	182	560	/	/	/
HCYR 150	1	152,4	156	1050	1030	558	190	1022	236	950	/	/	/
HCYR 200	2	219,1	224	689	649	360	257	350	/	574	212	252	150
HCYR 300	2	323,9	330	573	533	172	364	160	/	456	228	268	187



Connections

M : 3/8" SAE connections
(pressure nozzle on suction line)

N : 3/8" SAE valve (oil inlet)
+ 1/4" SAE pressure nozzle

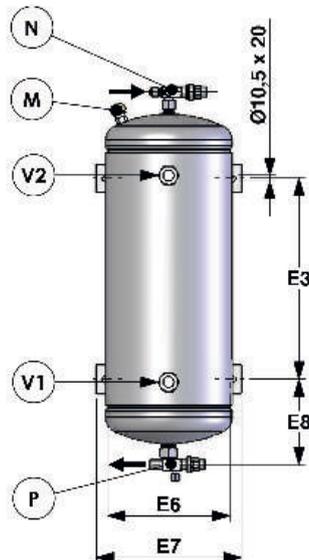
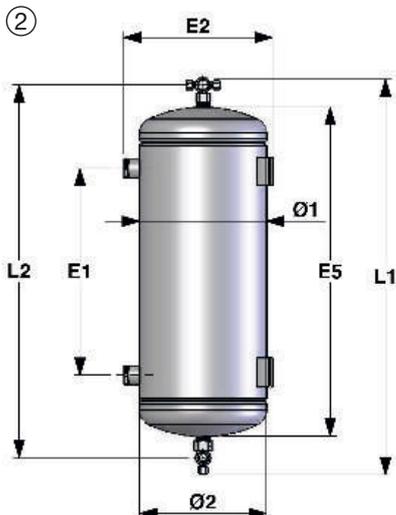
O : 3/8" SAE valve (oil outlet)
+ 1/4" SAE pressure nozzle

P : For HCYR 200 (oil outlet) :
1/2" ODF valve
+ 1/4" SAE pressure nozzle

P : For HCYR 300 (oil outlet) :
5/8" ODF valve
+ 1/4" SAE pressure nozzle

V1 : Lower oil level sight glass

V2 : Upper oil level sight glass





Oil receivers

→ HCYR

■ Technical features

CARLY references	Volume	Volume		Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	V L	V1 L	V2 L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
HCYR 40	3,9	1,0	2,9	46	15	120	-40	-30	I
HCYR 80	7,7	1,5	6,0	46	15	120	-40	-30	II
HCYR 81	7,4	1,9	5,6	46	15	120	-40	-30	II
HCYR 120	12,0	2,5	9,5	46	15	120	-40	-30	II
HCYR 121	11,2	2,8	8,4	46	15	120	-40	-30	II
HCYR 150	15,0	3,0	12,0	46	15	120	-40	-30	II
HCYR 200	20,0	3,8	15,0	45	15	120	-40	-30	II
HCYR 300	30,0	8,2	21,8	33*	15	120	-40	-30	II

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

* PS 42 bar possible on request.

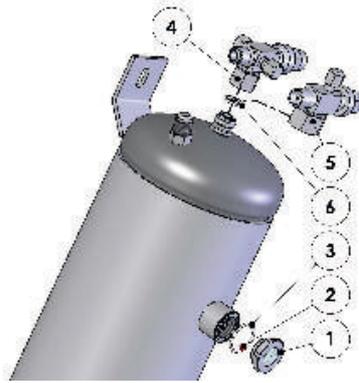


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Oil receivers

→ HCYR

■ Spare parts



①

CARLY references		Part Nb	Description
Oil receivers	Spare parts		
HCYR 40	CY 35012150	1	Glass without moisture indicator, gasket included
HCYR 80			
HCYR 81			
HCYR 120			
HCYR 121			
HCYR 150			
HCYR 200			
HCYR 300			



②

CARLY references		Part Nb	Description
Oil receivers	Spare parts		
HCYR 40	CY 10501000	2	Colour ball for sight-glass (level visualization)
HCYR 80			
HCYR 81			
HCYR 120			
HCYR 121			
HCYR 150			
HCYR 200			
HCYR 300			



③

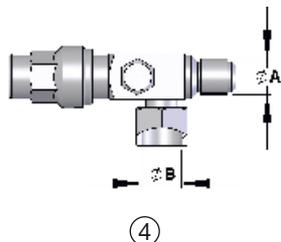
CARLY references		Part Nb	Description
Oil receivers	Spare parts		
HCYR 40	CY 15552180	3	PTFE o-ring gasket for glass
HCYR 80			
HCYR 81			
HCYR 120			
HCYR 121			
HCYR 150			
HCYR 200			
HCYR 300			



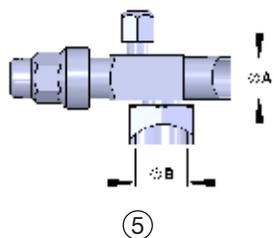
Oil receivers

→ HCYR

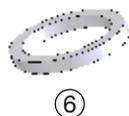
■ Spare parts



CARLY references		Part Nb	ROTALOCK valve with connection to screw, gasket included	
Oil receivers	Spare parts		ØA output valve SAE inch	ØB valve fixation UNF inch
HCYR 40	CY 19700100	4	3/8	3/4
HCYR 80				
HCYR 81				
HCYR 120				
HCYR 121				
HCYR 150				
HCYR 200				
HCYR 300				



CARLY references		Part Nb	ROTALOCK valve with connection to braze, gasket included	
Inlet	Outlet		ØA output valve ODF inch	ØB valve fixation UNF inch
HCYR 200		5	1/2	1
HCYR 300		5	5/8	1



CARLY references		Part Nb	Gasket for ROTALOCK valves inch
Inlet	Outlet		
HCYR 40		CY 15552180	3/4
HCYR 80	HCYR 40		
HCYR 81	HCYR 80		
HCYR 120	HCYR 81		
HCYR 121	HCYR 120		
HCYR 150	HCYR 121		
HCYR 200	HCYR 150		
HCYR 300			
	HCYR 200	CY 15580140	1
	HCYR 300		

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYR 40	4,95	4,60	1
HCYR 80	9,70	9,10	1
HCYR 81	9,30	8,90	1
HCYR 120	13,40	12,80	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYR 121	13,00	12,40	1
HCYR 150	13,50	13,30	1
HCYR 200	21,70	20,90	1
HCYR 300	32,50	31,30	1

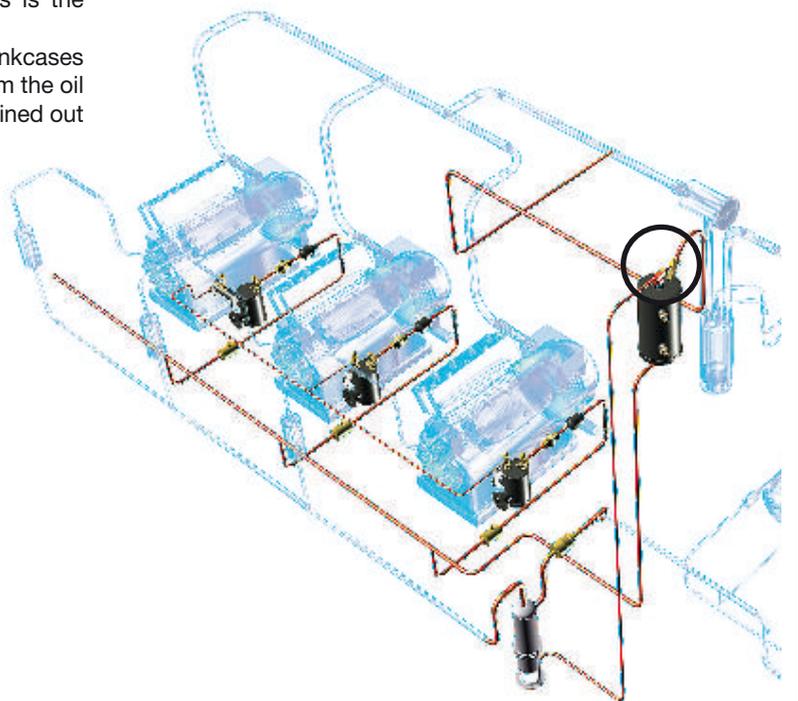


Differential valves for oil receivers

→ HCYCT (non adjustable) / HCYCTR (adjustable)

■ Applications

- Differential valves are used on low pressure oil return systems of refrigerating and air conditioning installation.
- They are mounted on oil receivers in which they maintain a permanent overpressure compared to the compressor crankcases in order to ensure them a constant oil distribution. This is the guarantee of a regular and permanent oil reintegration.
- Therefore, the oil which is returned to the compressor crankcases is free from refrigerant as, should any refrigerant come from the oil separator, it would be expanded in the oil receiver and drained out to the suction line via the differential valves.



■ Functional features

- Products are compatible with HFCs, HCFCs, CFCs, CO₂ as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 - Propane R290, Butane R600, Isobutane R600a, Propylene R1270 - with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- On adjustable differential valve HCYCTR:
 - Body and internal mechanism in brass
 - Valve spring strictly calibrated
 - PTFE gaskets.
- Adjustable differential valve HCYCTR:
 - Painted steel body with internal phosphating
 - Connection to the oil receiver orientable at 360° with a swivel nut 3/8" SAE
 - Screwed plug perfectly sealed to prevent any accidental handling of the adjustment rod
 - Internal Neoprene® sealing gasket.
- A 3/8" copper gasket is provided with the HCYCT and HCYCTR differential valves.

■ CARLY advantages

- Maximum working pressure: 46 bar
- HCYCT: 4 models of non adjustable differential valves with set pressures of 0.35, 1.4, 3.5 and 7 bar.
- The HCYCT 7 is suitable for working with high pressure differential (7 bar) such as CO₂ installations.
- HCYCTR: 1 model of adjustable differential valve allowing a possible adjustment of the set pressure with a rod handled with a tool (square section of 7,8 mm), from 0.35 bar to 3.5 bar. Adjustment in factory : 1,4 bar.
- The HCYCTR allow to very precisely adjust the differential of pressure, according to the characteristics of the compressors and the components of the oil return system.
- The possibility to adjust the pressure differential enables to solve some problems of oil return.
- GOST certified products.



Differential valves for oil receivers

→ HCYCT (non adjustable) / HCYCTR (adjustable)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the differential valves HCYCT / HCYCTR

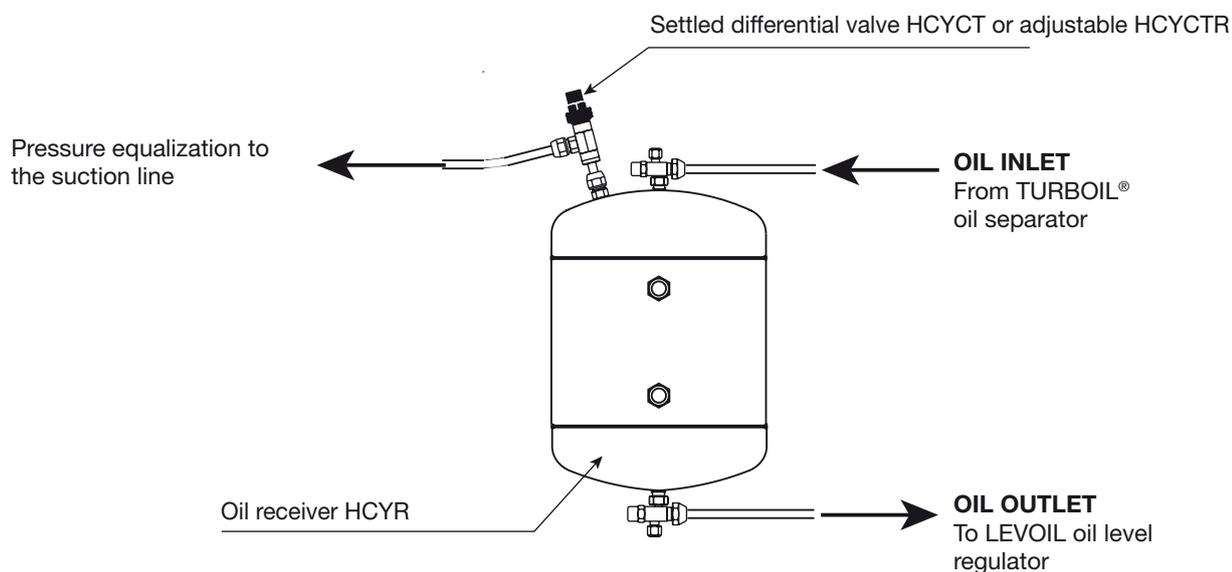
- The differential valves are to be mounted on the 3/8" SAE connection located in the higher part of the oil receiver by its female connection and connected to the suction line by its male connection.
- Be sure to comply with the flow direction indicated by an arrow engraved on the body of the differential valves.
- The tightening of the differential valves must imperatively be made with two open-end spanners, in order to avoid the twisting of the pipes, and the deterioration

of their brass body (tightening with pliers proscribed).

- On some multi-compressors installations, one or several compressors can operate at different suction pressures; in order to ensure correct oil feeding of all compressors, it is necessary to select the differential valves so as to establish a minimum overpressure of 0.35 bar between the oil receiver and the compressor with the highest suction pressure (refer to the selection example

chapter 49 - oil level regulators LEVOIL).

- On installations equipped with bi-level compressors or «Booster» system, it is recommended to connect the differential valves to the intermediary level suction line.
- For HCYCT/HCYCTR differential valves, carefully watch the correct positioning of the supplied copper seals.
- After every disassembly of the valves, it is imperative to replace the copper gasket before the re-assembly.



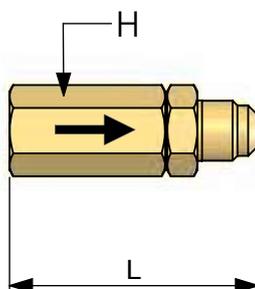


Differential valves for oil receivers

→ HCYCT (non adjustable)

■ Technical features

CARLY references	Connections to screw SAE inch		Pressure range bar	Dimensions mm	
	Inlet Female	Outlet Male		H upper faces	L
HCYCT 1	3/8	3/8	0,35	21	65
HCYCT 3	3/8	3/8	1,40	21	65
HCYCT 4	3/8	3/8	3,50	21	65
HCYCT 7	3/8	3/8	7,00	21	65



CARLY references	Nominal diameter	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	DN inch	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
HCYCT 1	3/8	46	15	120	-40	-30	Art3§3
HCYCT 3	3/8	46	15	120	-40	-30	Art3§3
HCYCT 4	3/8	46	15	120	-40	-30	Art3§3
HCYCT 7	3/8	46	15	120	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).



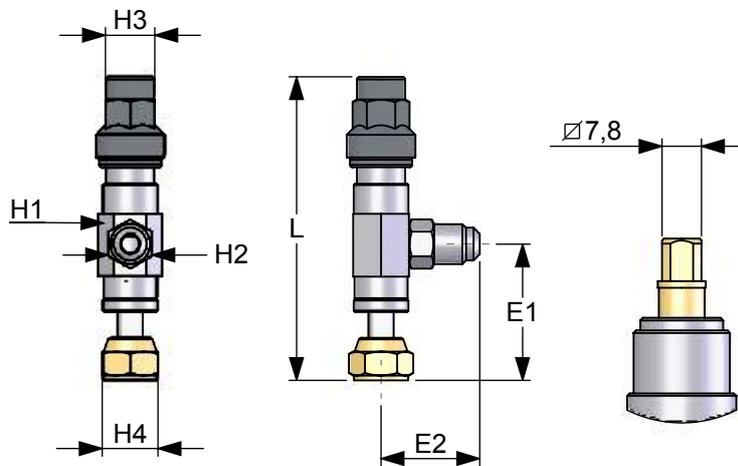
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Differential valves for oil receivers

→ HCYCTR (adjustable)

■ Technical features

CARLY references	Connections to screw SAE inch		Pressure range bar	Dimensions mm						
	Inlet Female	Outlet Male		H1 upper faces	H2 upper faces	H3 upper faces	H4 upper faces	L	E1	E2
HCYCTR	3/8	3/8	0,35 à 3,50	22	17	20	21	125	58	39



CARLY references	Nominal diameter	Maximal working pressure	Working pressure (1)	Maximal working temperature	Minimal working temperature	Working temperature (1)	CE Category (2)
	DN inch	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
HCYCTR	3/8	46	15	120	-40	-30	Art3§3

(1) The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

(2) Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

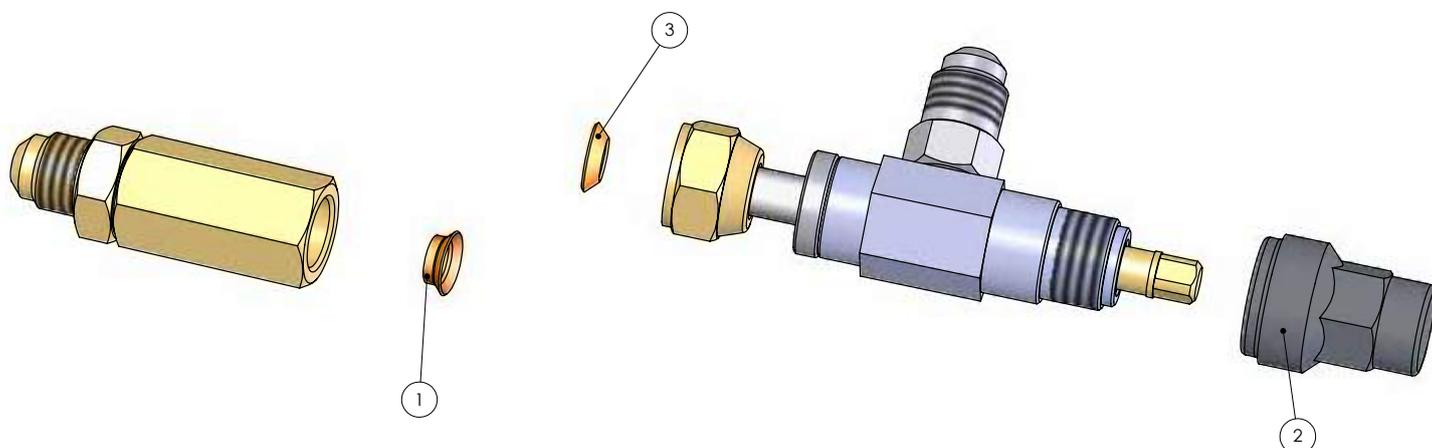


Differential valves for oil receivers

→ HCYCT (non adjustable) / HCYCTR (adjustable)

■ Spare parts

CARLY references		Part Nb	Description	Quantity
Valves for receivers	Spare parts			
HCYCT	CY 15590025	1	Set of 25 taper guided copper gaskets for 3/8" SAE connection	1
HCYCTR	CY 10870010	2	Plug for inspection rod	1
HCYCTR	CY 15590020	3	Set of 25 taper copper gaskets for 3/8" SAE connection	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYCT 1	0,16	0,15	1
HCYCT 3	0,16	0,15	1
HCYCT 4	0,16	0,15	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYCT 7	0,16	0,15	1
HCYCTR	0,23	0,20	1

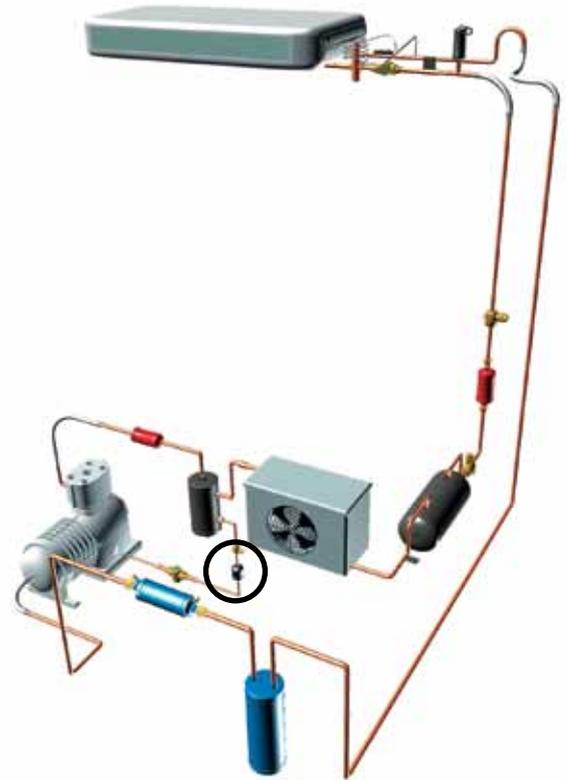


Oil filters

→ HCYF

■ Applications

- Oil filtering on the oil return line to the compressor sumps of refrigerating and air conditioning installations.
- These filters are required for the good operation of oil level regulators and compressors. It protect them from any contaminants that could damage them (metallic chips, filings, oxides, sludge, etc...).



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
 - Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtrating core made of stainless steel mesh cloth.
 - Filtering efficient at 160 microns.
 - Several types of connections are possible on standard products:
 - To be screwed type SAE
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimetres (MMS).



Possible customization on demand :

- Specific connections (O-RING, ORFS,...)
- Connections to braze, 100 % copper
- Aluminium casings and unions (weight optimisation)
- Stainless steel casings and unions (resistance to corrosion and at low temperatures)
- Lower filtration threshold
- Filtering surface of the core, more or less important according to the specificities of the machine.

■ CARLY advantages

- Maximum working pressure: 46 bar, may be used on high pressure oil return systems.
- Very large filtering surface areas for very low pressure drop.
- Presence of a permanent magnet located at the inlet of the filter, ensuring the immediate “trapping” of all steel particles.
- Very large range of filters: 6 different models.
- Connections to solder are made of copper-plated steel and allow to use brazing alloys with a low silver percentage; their resistance to pressure is much higher than the full copper connections.
- GOST certified products.



Oil filters

→ HCYF

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the oil filters HCYF

- The oil filters are to be mounted on the oil return line, between the oil separator and the oil level regulator, as close as possible to the latter.
- The direction of oil flow, indicated by an arrow on the filter tag and by an “IN” sticker next to the inlet connection, must imperatively be respected.
- The degree of clogging of the filters must be regularly checked, ensuring that the oil return is correct in the crankcases

of compressors; oil filters must be imperatively replaced at the first sign of clogging.

- It is highly recommended to install downstream oil filter an oil sight glass HCYVP (refer to chapter 48) in order to visually check the presence and the condition of the oil.
- HCYF oil filter only ensures mechanical filtering of solid contaminants; to ensure an optimal protection of the oil level

regulators and of the compressors operating with highly hydrophilous POE oils, it is imperative to use an HYDROIL filter drier for POE oils: refer to chapter 47.

- Make sure that the piping can support without deformation the weight of the oil filter; otherwise, plan the attachment of the oil filter with a clamp on a stable part of the installation.



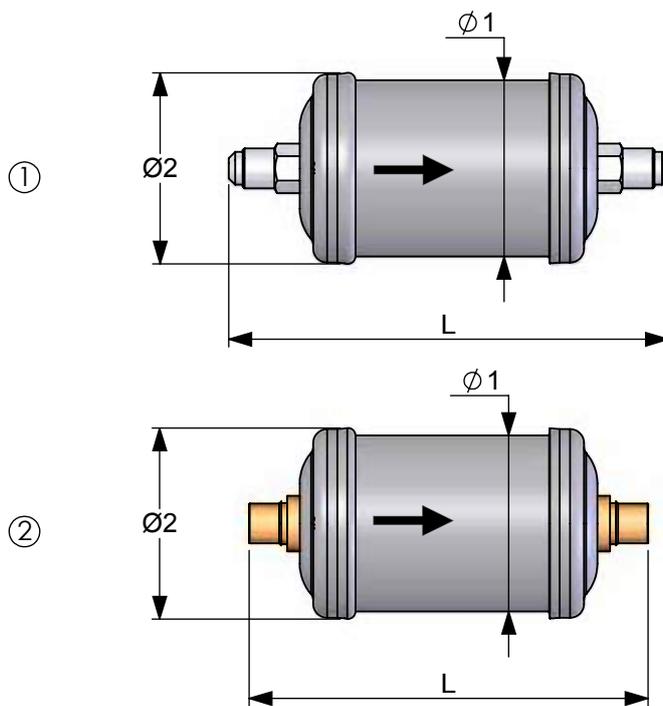
Oil filters

→ HCYF

■ Technical features

CARLY references	Connections To screw SAE inch	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Connections types ⁽¹⁾	Drawing Nb	Filtering surface cm ²	Dimensions mm		
								Ø1	Ø2	L
HCYF 52	1/4				1	1	70	50	55	121
HCYF 53	3/8				1	1	70	50	55	127
HCYF 53 S		3/8	HCYF 53 MMS	10	2	2	70	50	55	112
HCYF 83	3/8				1	1	121	89	96	140
HCYF 84	1/2				1	1	121	89	96	144

⁽¹⁾ Chapter "Connection features and drawings" (refer to chapter 114).



CARLY references	Volume V L	Maximal working pressure PS bar	Working pressure ⁽¹⁾		Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature ⁽¹⁾ TS BT °C	CE Category ⁽²⁾
			PS	BT				
HCYF 52	0,1	46	PS	BT	120	-40	-30	Art3§3
HCYF 53	0,1	46	PS	BT	120	-40	-30	Art3§3
HCYF 53 S	HCYF 53 MMS	0,1	46	15	120	-40	-30	Art3§3
HCYF 83	0,5	46	PS	BT	120	-40	-30	Art3§3
HCYF 84	0,5	46	PS	BT	120	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).



Oil filters

→ HCYF

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYF 52	0,28	0,25	24
HCYF 53	0,28	0,25	24
HCYF 53 S & MMS	0,28	0,25	24
HCYF 83	0,78	0,75	6
HCYF 84	0,83	0,80	6



Oil filters

→ HCYF-P6 / 64 bar (928 psig)

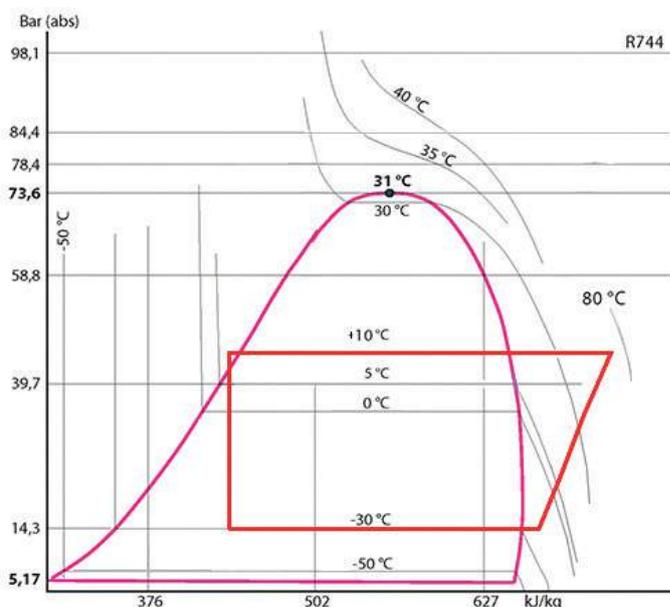
■ Applications

- Oil filtering on the oil return line to the compressor sumps of refrigerating and air conditioning installations, running in high working pressures.
- These filters are required for the good operation of oil level regulators and compressors. It protect them from any contaminants that could damage them (metallic chips, filings, oxides, sludge, etc...).



64 bar

CO₂ SUBCRITICAL



■ Functional features

- Products are compatible with HFC, CO₂, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtrating core made of stainless steel mesh cloth.
- Filtering efficient at 5 microns.
- Several types of connections are possible on standard products:
 - To be screwed type SAE
 - To be brazed for tubes in inches (S)
 - To be brazed for tubes in millimetres (MMS).



Possible customization on demand :

- Specific connections (O-RING, ORFS,...).
- Stainless steel casings and unions (resistance to corrosion and at low temperatures).
- Lower filtration threshold.
- Filtering surface of the core, more or less important according to the specificities of the machine.

■ CARLY advantages

- Maximum working pressure: up to 64 bar with CO₂ in subcritical compression systems.
- Very large filtering surface areas for very low pressure drop.
- Presence of a permanent magnet located at the inlet of the filter, ensuring the immediate “trapping” of all steel particles.
- Very large range of filters: 6 different models.
- Connections to solder are made of copper-plated steel and allow to use brazing alloys with a low silver percentage; their resistance to pressure is much higher than the full copper connections.



Oil filters

→ HCYF-P6 / 64 bar (928 psig)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component,
- Other are general to all CARLY components,

and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;

they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the oil filters HCYF-P6

- The oil filters are to be mounted on the oil return line, between the oil separator and the oil level regulator, as close as possible to the latter.
- The direction of oil flow, indicated by an arrow on the filter tag and by an “IN” sticker next to the inlet connection, must imperatively be respected.
- The degree of clogging of the filters must be regularly checked, ensuring that the oil return is correct in the crankcases of compressors; oil filters must be imperatively replaced at the first sign of clogging.
- It is highly recommended to install downstream oil filter an oil sight glass HCYVP-P in order to visually check the presence and the condition of the oil.
- HCYF-P6 oil filter only ensures mechanical filtering of solid contaminants.
- Make sure that the piping can support without deformation the weight of the oil filter; otherwise, plan the attachment of the oil filter with a clamp on a stable part of the installation.



Oil filters

→ HCYF-P6 / 64 bar (928 psig)

■ Special precautions for components used with CO₂ in subcritical systems

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The hot gas defrost, frequently used with CO₂ for low temperatures applications, generates also high pressures (to take in consideration)
- The implementation on the liquid line of a filter drier **DCY-P6**, or a filter drier shell **BCY-P6** equipped with drying cores **CCY 48 HP** or **PLATINIUM 48**, is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice and even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly oil filters HCYF-P6 do not have polymer gaskets directly in contact with CO₂.



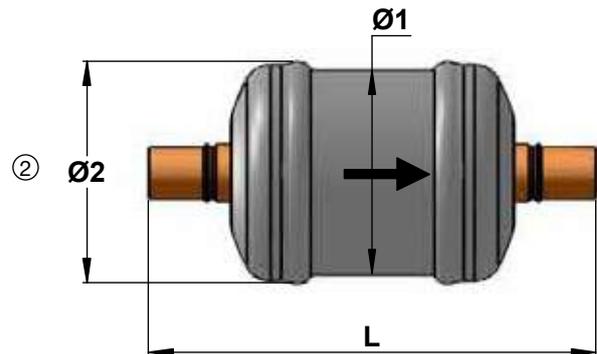
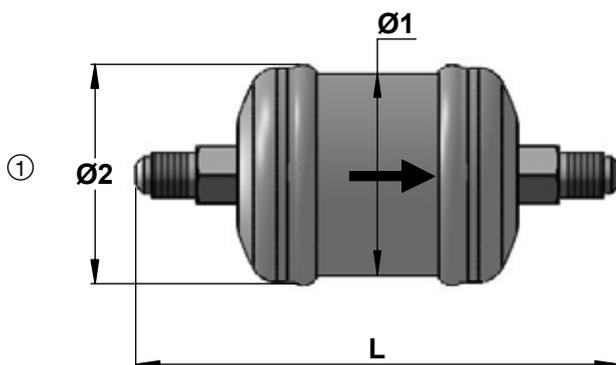
Oil filters

→ HCYF-P6 / 64 bar (928 psig)

■ Technical features

CARLY references	Connections To screw SAE inch	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Connections types (1)	Drawing Nb	Filtering surface cm ²	Dimensions mm		
								Ø1	Ø2	L
HCYF-P6 52	1/4				1	1	70	50	55	119
HCYF-P6 53	3/8				1	1	70	50	55	125
HCYF-P6 53 S		3/8	HCYF-P6 53 MMS	10	2	2	70	50	55	112
HCYF-P6 83	3/8				1	1	121	89	96	140
HCYF-P6 84	1/2				1	1	121	89	96	144

(1) Chapter "Connection features and drawings" (refer to chapter 114 of CARLY technical catalogue).



CARLY references	Volume V L	Maximal working pressure PS bar	Working pressure (1)		Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature (1)		CE Category (2)
			PS BT bar	TS BT °C					
HCYF-P6 52	0,15	64	15	120	-40	-30	Art3§3		
HCYF-P6 53	0,15	64	15	120	-40	-30	Art3§3		
HCYF-P6 53 S	HCYF-P6 53 MMS	0,15	64	15	120	-40	-30	Art3§3	
HCYF-P6 83	0,50	64	15	120	-40	-30	Art3§3		
HCYF-P6 84	0,50	64	15	120	-40	-30	Art3§3		

(1) The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

(2) Classification by volume, according to PED 97/23/EC (refer to chapter 0 of CARLY technical catalogue).



Oil filters

→ HCYF-P6 / 64 bar (928 psig)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYF-P6 52	0,31	0,28	1
HCYF-P6 53	0,31	0,28	1
HCYF-P6 53 S & MMS	0,31	0,28	1
HCYF-P6 83	0,78	0,75	1
HCYF-P6 84	0,83	0,80	1



Oil filters

→ HCYF-P14 / 140 bar (2030 psig)

■ Applications

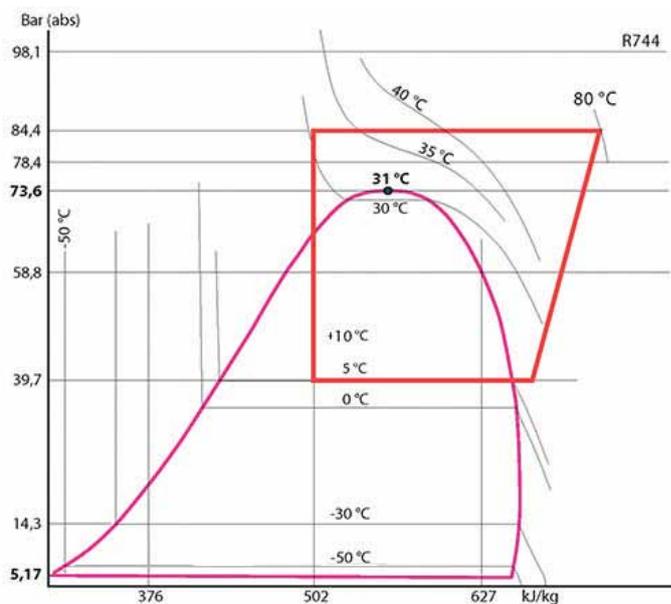
- Oil filtering on the oil return line to the compressor sumps of refrigerating and air conditioning installations, running with high working pressures, with CO₂ in transcritical compression systems.
- These filters are required for the good operation of oil level regulators and compressors. They protect them from any contaminants that could damage them (metallic chips, filings, oxides, sludge, etc...).



140 bar



TRANSCRITICAL



■ Functional features

- Products are compatible with CO₂, as well as with its associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtrating core made of stainless steel mesh cloth.
- Filtering efficient at 5 microns.
- Connections on standard products: screwed type SAE and ODF to solder.



Possible customization on demand :

- Specific connections (O-RING, ORFS,...).
- Stainless steel casings and unions (resistance to corrosion and at low temperatures).
- Lower filtration threshold.
- Filtering surface of the core, more or less important according to the specificities of the machine.

■ CARLY advantages

- Maximum working pressure: up to 140 bar with CO₂ in transcritical compression systems.
- Very large filtering surface areas for very low pressure drop.
- Automatic bypass of the internal filter when it is too dirty and when the pressure drop generated exceeds 3 bar; this particularity ensures the continuity of compressor lubrication, even if filter maintenance is late.



Oil filters

→ HCYF-P14 / 140 bar (2030 psig)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component,
- Other are general to all CARLY components,

and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;

they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the oil filters HCYF-P14

- The oil filters are to be mounted on the oil return line, between the oil separator and the oil level regulator, as close as possible to the latter.
- The direction of oil flow, indicated by an arrow on the filter tag and by an “IN” sticker next to the inlet connection, must imperatively be respected.
- The degree of clogging of the filters must be regularly checked, ensuring that the oil return is correct in the crankcases of compressors; oil filters must be imperatively replaced at the first sign of clogging.
- It is highly recommended to install downstream oil filter an oil sight glass HCYVP-P in order to visually check the presence and the condition of the oil.
- HCYF-P14 oil filter only ensures mechanical filtering of solid contaminants.
- Make sure that the piping can support without deformation the weight of the oil filter; otherwise, plan the attachment of the oil filter with a clamp on a stable part of the installation.



Oil filters

→ HCYF-P14 / 140 bar (2030 psig)

■ Special precautions for components used with CO₂ in transcritical systems

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The implementation on the liquid line of a filter drier **DCY-P14**, or a filter drier shell **BCY-P14** equipped with drying cores **CCY 48 HP** or **PLATINIUM 48**, is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice and even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly oil filters HCYF-P14 do not have polymer gaskets directly in contact with CO₂.



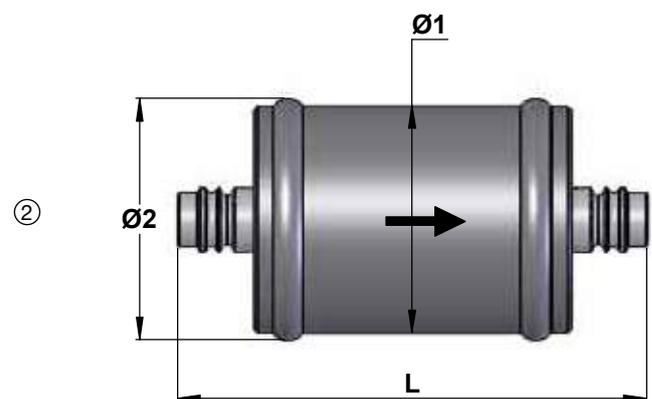
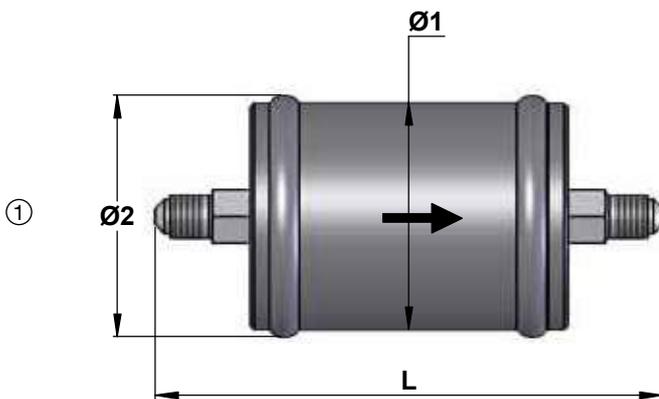
Oil filters

→ HCYF-P14 / 140 bar (2030 psig)

■ Technical features

CARLY references	Connections To screw SAE inch	Connections To solder ODF inch	Connections To solder ODF mm	Connections types (1)	Drawing Nb	Filtering surface cm ²	Dimensions mm		
							Ø1	Ø2	L
HCYF-P14 52	1/4			1	1	70	60	64	142
HCYF-P14 52 S/MMS		1/4	6	4	2	70	60	64	124
HCYF-P14 53	3/8			1	1	70	60	64	146
HCYF-P14 53 S/MMS		3/8	10	4	2	70	60	64	124

(1) Chapter "Connection features and drawings" (refer to chapter 114 of CARLY technical catalogue).



CARLY references	Volume V L	Maximal working pressure PS bar	Working pressure (1)		Maximal working temperature TS maxi °C	Minimal working temperature TS mini °C	Working temperature (1)		CE Category (2)
			PS BT bar	TS BT °C					
HCYF-P14 52	0,11	140	15	120	-40	-30	Art3§3		
HCYF-P14 52 S/MMS	0,11	140	15	120	-40	-30	Art3§3		
HCYF-P14 53	0,11	140	15	120	-40	-30	Art3§3		
HCYF-P14 53 S/MMS	0,11	140	15	120	-40	-30	Art3§3		

(1) The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

(2) Classification by volume, according to PED 97/23/EC (refer to chapter 0 of CARLY technical catalogue).



Oil filters

→ HCYF-P14 / 140 bar (2030 psig)

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYF-P14 52	1,20	1,07	1
HCYF-P14 52 S/MMS	1,20	1,07	1
HCYF-P14 53	1,20	1,07	1
HCYF-P14 53 S/MMS	1,20	1,07	1

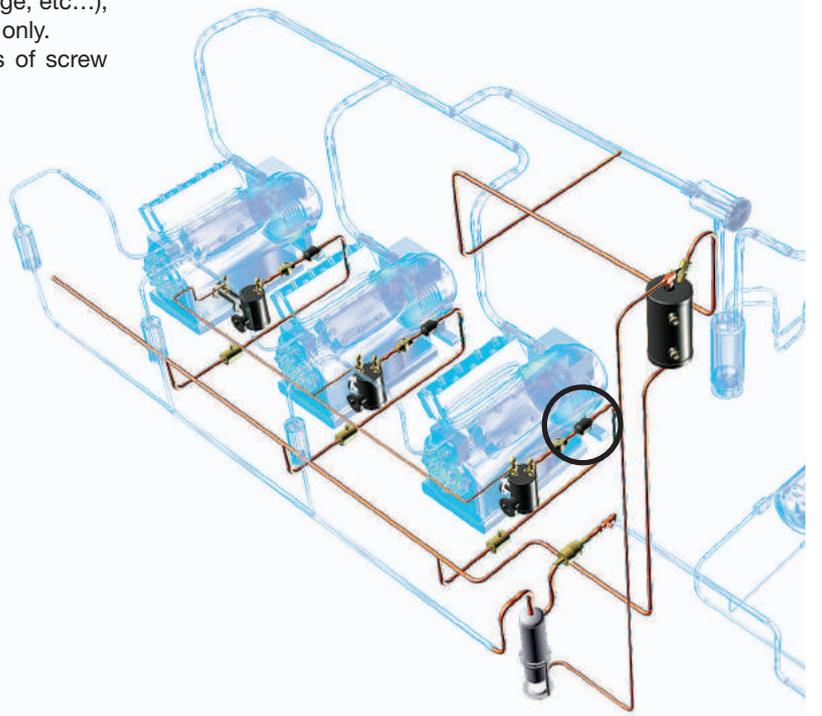


Replaceable core oil filter shells

→ HCYBF

■ Applications

- Oil filtering on the oil return line to the compressor sumps of high capacity refrigerating and air conditioning installations.
- These filters are essential for the proper functioning of oil level regulators and protect the compressors from contaminants that could damage them (metallic chips, filings, oxides, sludge, etc...); they allow the replacement of the oil filters' active parts only.
- These filters are recommended for the oil return lines of screw compressors and of centrifuge compressors.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- The oil filter shells are used with the CCY 48 HU filtrating cores (refer to chapter 8)
- 1/4" NPT taper tapping and its plug on the end plate, allowing the installation of a pressure tap or a feeding valve.
- End plate perfectly airtight thanks to its circular rim and its gasket compatible with all HFCs, HCFCs, CFCs, CO₂, as well as with their oils and associated additives.

■ Possible customization on demand:

- Specific connections.
- Larger number of cores: 2 and 3 cores.

■ CARLY advantages

- Individual core holders treated against corrosion by zinc-coating, with a reduced course to allow for core replacement; therefore, the time needed for replacement is extremely reduced, limiting oil core and inner circuit part exposition times to ambient atmosphere.
- Core holders are designed to ensure an automatic and immediate centring in the oil filter shell and an excellent distribution of the oil around the core, with a minimum pressure drop.
- CCY 48 HU oil core, filtering of 16 microns on a large surface.
- GOST certified products.



Replaceable core oil filter shells

→ HCYBF

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the oil filter shells HCYBF

- The oil filter shells are to be mounted on the oil return line, between the oil separator and the oil level regulator, as close as possible to the latter.
- Mounting to be performed in whichever position, but not vertically with the outlet connection oriented downwards.
- The oil flow direction indicated by an arrow on the filter tag should be respected.
- When mounting the oil filter shells, provide for a sufficient course to allow the replacement of cores (refer to dimensions in Technical features tables).
- The level of blocking of the filtrating cores must be regularly checked, making

sure that the oil return is correct at the compressor crankcase. These filter cores must be imperatively replaced at the first sign of clogging.

- Oil filter shells selection should take into account the integration of the internal active element (cores CCY 48 HU); this integration can be temporary or permanent.
- It is highly recommended to install a HCYVP sight glass upstream of the oil filter shell (refer to chapter 48), in order to visually check the presence and condition of the oil.
- HCYBF oil filter shell only ensures

mechanical filtering of solid contaminants; to ensure optimal protection of the oil level regulators and of the compressors operating with very hydrophilous POE oils, it is imperative to use an HYDROIL filter drier for POE oils: refer to chapter 47.

- * Make sure that the piping can support without deformation the weight of the filter drier shell ; otherwise, provide for a clamp of the filter drier shell with a clamp on a stable part of the installation.

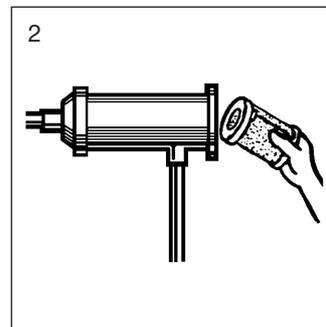
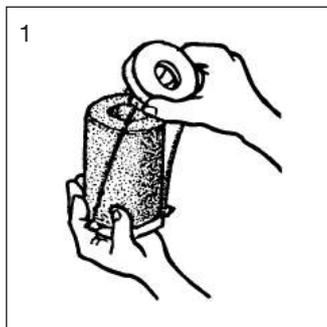


Replaceable core oil filter shells

→ HCYBF

■ CCY 48 HU core replacement procedure

- 1 • Isolate the **HCYBF** oil filter shell.
- 2 • Purge the installation up to atmospheric pressure (the shell should be empty of oil)
- 3 • Remove the end plate.
- 4 • Remove the core holders.
- 5 • Remove the used core.
- 6 • Clean very carefully the core holders as well as the inner part of the shell case.
- 7 • Replace systematically the end plate gasket.
- 8 • Remove the core from its packaging and put it in the core holder, separating by traction the two flanges holding the core holder (sketch 1)
- 9 • Put the core holders back into place with their core in the shell (sketch 2)
- 10 • Reinstall the closing flange making sure that the compression spring is correctly positioned and gradually and uniformly tighten the closing screws (refer to chapter 115 – GENERAL MOUNTING PRECAUTIONS – Criss-cross tightening). Maximum bolt tightening torque: 30 N.m.
- 11 • Make sure that the end plate's 1/4" NPT taper tapping has been properly plugged in and sealed.
- 12 • Make vacuum in the installation and check air-tightness of the whole set before putting back under pressure.





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Replaceable core oil filter shells

→ HCYBF

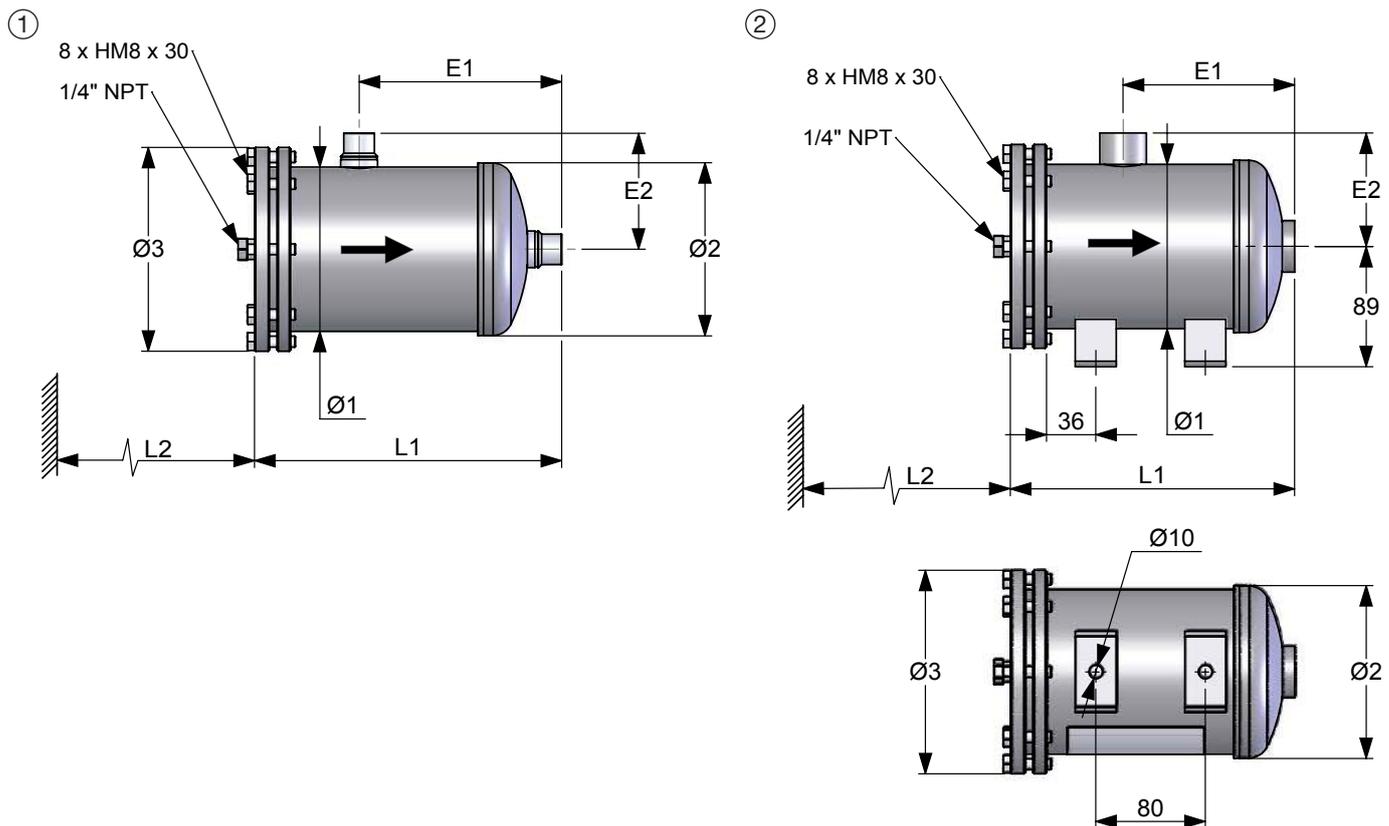
■ Caractéristiques techniques

CARLY references	Connections To screw SAE pouce	Connections To solder ODF pouce	Connections To solder ODF mm	Filtering surface cm ²	Maximal admissible oil flow l/mn ⁽¹⁾	Drawing Nb	Connections types ⁽³⁾	Dimensions mm						Number of cores	
								Ø1	Ø2 ⁽²⁾	Ø3	L1	L2	E1		E2
HCYBF 485 S/MMS		5/8	16	5790	55	1	2	121	128	150	223	210	139	83,0	1
HCYBF 486 S		3/4		5790	70	1	2	121	128	150	225	210	148	86,0	1
HCYBF 486 N	3/4 NPT			5790	70	2	/	121	128	150	208	210	125	84,0	1

⁽¹⁾ These values take into account the capacity limitation linked to the connections flow area and to the performance average of the oil cores available on the market. For higher flow rates, it is recommended to install several shells in parallel.

⁽²⁾ With welding.

⁽³⁾ Chapter «Connection features and drawings» (refer to chapter 114).



CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
HCYBF 485 S/MMS	1,9	35	15	100	-40	-30	I
HCYBF 486 S	1,9	35	15	100	-40	-30	I
HCYBF 486 N	1,9	35	15	100	-40	-30	I

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0).

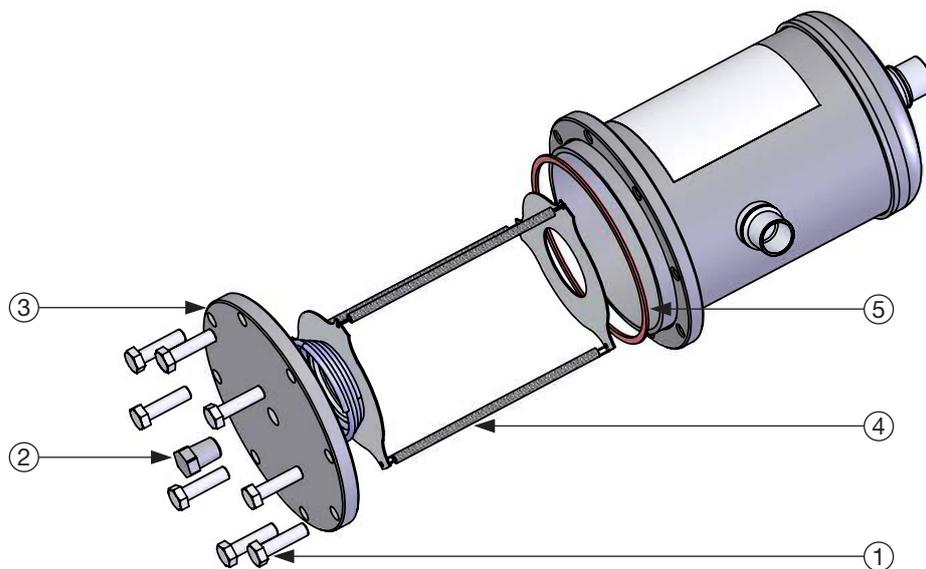


Replaceable core oil filter shells

→ HCYBF

■ Spare parts

CARLY references		Part N°	Description
Filter shells	Spare parts		
All HCYBF references	CY 19900411	1	Set of 8 fastening screws for end plate
	CY 10810010	2	1/4" NPT phosphate plug for end plate
	CY 33301200	2 + 3 + 5	1/4" NPT plug + End plate + gasket
	CY 37002010	4	Core holder
	CY 15555601	5	End plate gasket



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYBF 485 S/MMS	4,55	4,30	1
HCYBF 486 S	4,60	4,35	1
HCYBF 486 N	4,70	4,45	1

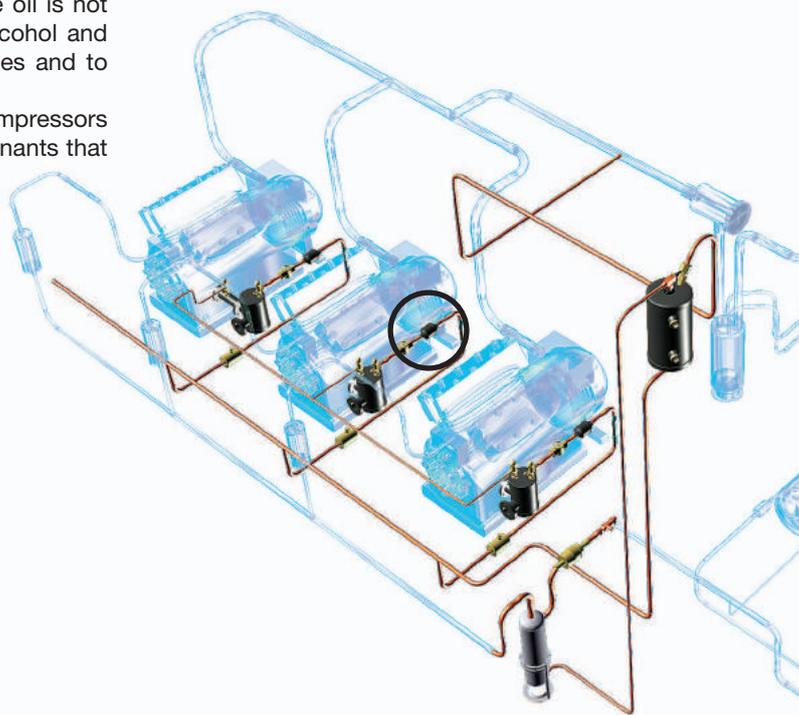


Filter drier for polyol-ester oils (POE)

→ HYDROIL

■ Applications

- Continuous filtration and dehydration of polyol-ester oils (POE), on the oil return line to the compressors crankcases, present in the refrigerating and air conditioning installations.
- HYDROIL is a safety component for refrigerating compressors, because when the quantity of water contained in the oil is not controlled, the esters transform by hydrolysis into alcohol and fatty acids (soaps), likely to block the smallest orifices and to cause the compressor burnout.
- This filter is essential for the proper functioning of the compressors and oil level regulators. It protects them from contaminants that may damage them (metallic chips, filings, oxides, sludge, humidity, etc...).



■ Functional features

- Products are compatible with HFCs, HCFCs, CFCs, CO₂ as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 - Propane R290, Butane R600, Isobutane R600a, Propylene R1270 - with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Filtering threshold: 10 microns
- Initial drying capacity guaranteed by a 200 °C oven drying and airtight sealing.



Possible customization on demand:

- Specific connections (O-RING, ORFS, ...)
- Connections to braze 100 % copper

■ CARLY advantages

- Maximum working pressure 46 bar
- Those filters may be used on low and high pressure oil return systems.
- Automatic bypass of the internal filter when it is too dirty and when the pressure drop generated exceeds 0.5 bar; this particularity ensures the continuity of compressor lubrication, even if filter maintenance is late.
- A large contaminant retention capacity is ensured by an important filtering area of 175 cm² and by a volume of drying agents of 170 cm³ with very low pressure drop.
- Chemical agents in the form of free grains, for very high drying performances.
- A pressure tap on the filter case makes it possible to check its good operation.
- GOST certified products.



CTCY-EN – 47.1-3 / 01-2014

Filter drier for polyol-ester oils (POE)

→ HYDROIL

■ Warning

Before selecting or installing any component, please refer to the chapter **WARNING** in page 0.6.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component,
- Other are general to all CARLY

and in this case, they are specified in the **RECOMMENDATIONS** part defined hereafter ;

components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the oil filters HYDROIL

- The oil filters are to be mounted on the oil return line, between the oil separator and the oil level regulator, as close as possible to the latter.
- The direction of oil flow, indicated by an arrow on the filter tag and by an "IN" sticker next to the inlet connection, must imperatively be respected.
- The degree of clogging of the filters must be regularly checked, ensuring that the oil return is correct in the crankcases of compressors; oil filters must be imperatively replaced at the first sign of clogging.
- It is highly recommended to install downstream oil filter an oil sight glass HCYVP (refer to chapter 48) in order to visually check the presence and the condition of the oil.
- The change of the filter is recommended after each intervention on the oil circuit and particularly after an addition of oil.
- The POE oils are very hydrophilous, therefore the installation of a HCYF or HCYBF regular oil filter is not sufficient.
- Oil acidity monitoring is ensured by using TESTOIL-POE acidity tests: refer to chapter 91.
- Make sure that the piping can support without deformation the weight of the oil filter; otherwise, plan the attachment of the oil filter with a clamp on a stable part of the installation.



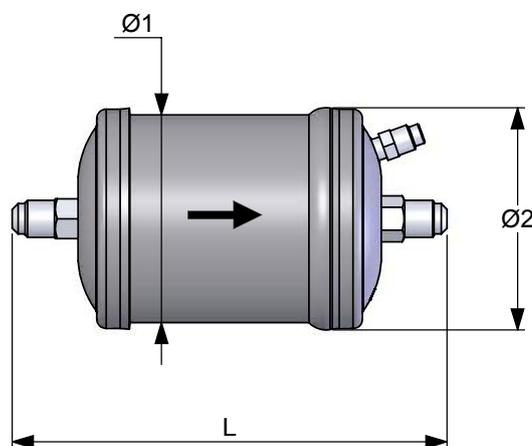
Filter drier for polyol-ester oils (POE)

→ HYDROIL

■ Technical features

CARLY references	Connections To screw SAE inch	Connections types ⁽¹⁾	Filtering surface cm ²	Volume of desiccation products cm ³ ⁽¹⁾	Dimensions mm		
					Ø1	Ø2	L
HYDROIL 163	3/8	1	175	170	89	96	185

⁽¹⁾ Chapter "Connection features and drawings" (refer to chapter 114).



CARLY references	Volume	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	V L	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
HYDROIL 163	0,7	46	15	120	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by volume, according to PED 97/23/EC (refer to chapter 0 page 7).

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HYDROIL 163	1,59	1,55	6

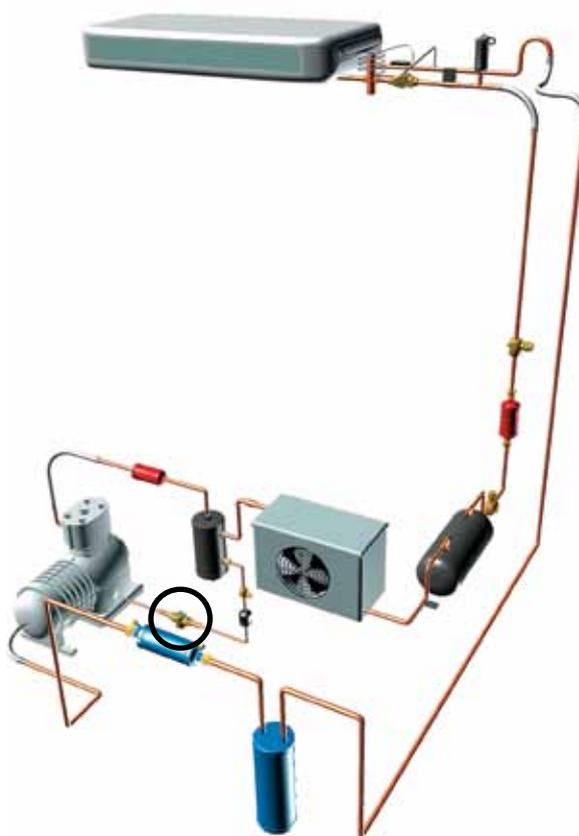


Oil sight glasses

→ HCYVP

■ Applications

- Immediate visual check of the oil presence and aspect in the oil lines of refrigerating and air conditioning installations.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is done with the PED 97/23/EC table, corresponding to a volume-based selection.
- The robust brass body guarantees a perfect resistance to corrosion.
- One-piece construction and crimping of the glass ensure a perfect air tightness thanks to a PTFE gasket.
- The sight glasses with flare connections to screw are provided with copper gaskets.



Possible customization on demand:

- Maximum working pressure higher than 42 bar

■ CARLY advantages

- Maximum working pressure 42 bar
- Those sight glasses may be used on low and high pressure oil return systems
- Good visibility ensured by the large area of the glass and the absence of any indicator ring or central tip.
- Installation facilitated by long copper sleeves for the models to be brazed and by the presence of a hexagon head bolt for positioning and tightening of flare models.
- The male/female connection simplifies the assembly of the oil line components, without having to use accessories such as dudgeon/nut, sleeve, etc...
- The very low weight of the HCYVP sight glasses requires no specific binding.
- GOST certified products.



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Oil sight glasses

→ HCYVP

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

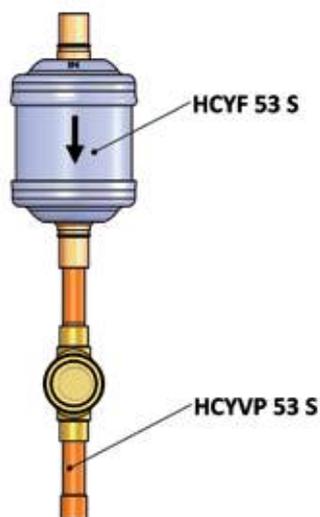
RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

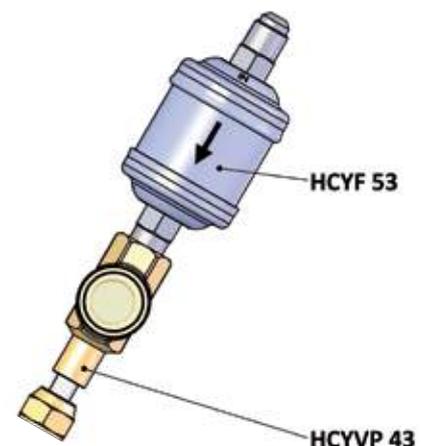
- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the sight glasses HCYVP

- The oil sight glasses are to be mounted on the oil return line, between the oil separator and the oil level regulator, as close as possible to the latter and, if possible, after the oil filters.
- The tightening of the oil sight glasses with flare connections must imperatively be made with two open-end spanners, in order to avoid the twisting of the pipes, and the deterioration of their brass body (tightening with pliers proscribed).
- For the oil sight glasses with connection to be brazed, imperatively cool down the body with a damp cloth or by using the calories discharger CARLYCOOL (see chapter 95).
- During installation of the oil sight glasses with female flare connections, carefully watch the correct positioning of the supplied copper seals.
- After every disassembly of the oil sight glasses with flare connections, it is imperative to replace the copper gasket before the re-assembly.



Example of assembling for components with solder connections



Example of assembling for components with screw connections

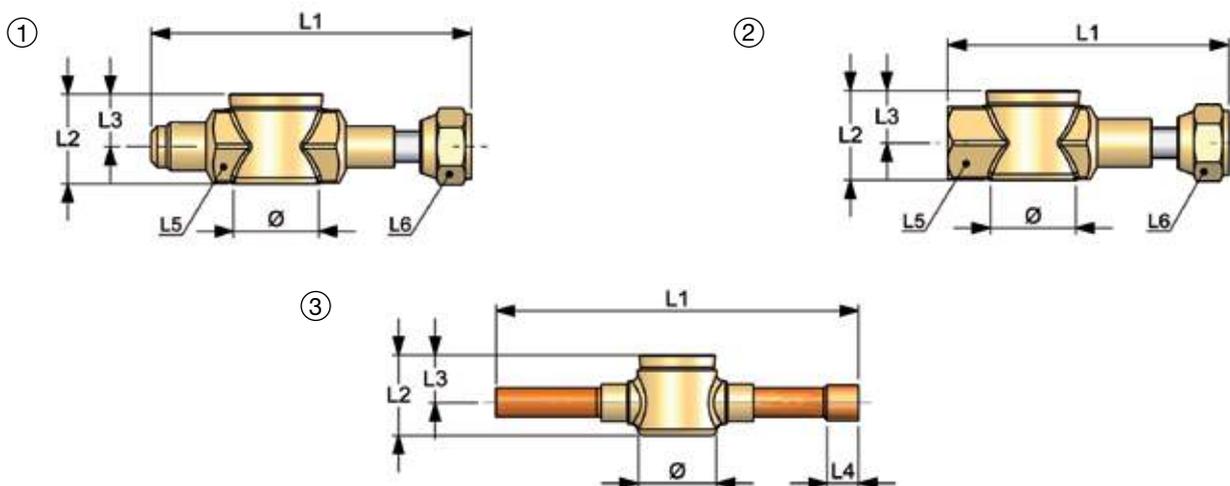


Oil sight glasses

→ HCYVP

■ Technical features

CARLY references	Connections						Drawing Nb	Dimensions mm						
	To screw SAE		To solder ODM		To screw SAE			Ø1	L1	L2	L3	L4 upper faces	L5 upper faces	
	inch	inch	mm	inch	inch	mm								
HCYVP 23	3/8 M				3/8 F		1	32	105	30	17	/	24	22
HCYVP 43	3/8 F				3/8 F		2	32	92	30	17	/	24	22
HCYVP 53 S			3/8		3/8		3	26	119	27	16	10	/	/
HCYVP 53 MMS			10		10		3	26	119	27	16	10	/	/



CARLY references	Nominal diameter	Nominal diameter	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	DN mm	DN inch	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
HCYVP 23		3/8	42	/	120	-20	/	Art3§3
HCYVP 43		3/8	42	/	120	-20	/	Art3§3
HCYVP 53 S		3/8	42	/	120	-20	/	Art3§3
HCYVP 53 MMS	10		42	/	120	-20	/	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

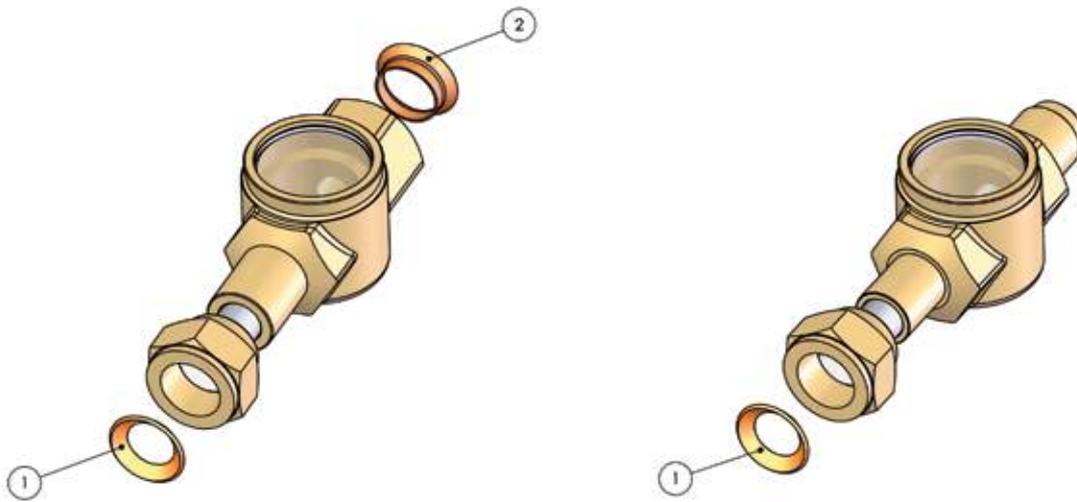


Oil sight glasses

→ HCYVP

■ Spare parts

CARLY references	Part Nb	Description	HCYVP Types	Quantity
CY 15590020	1	Set of 25 taper copper gaskets for connection with swivel nut 3/8" SAE	43	1
CY 15590025	2	Set of 25 taper guided copper gaskets for 3/8" SAE connection	43	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYVP 23	0,24	0,23	1
HCYVP 43	0,23	0,22	1
HCYVP 53 S & MMS	0,11	0,10	1

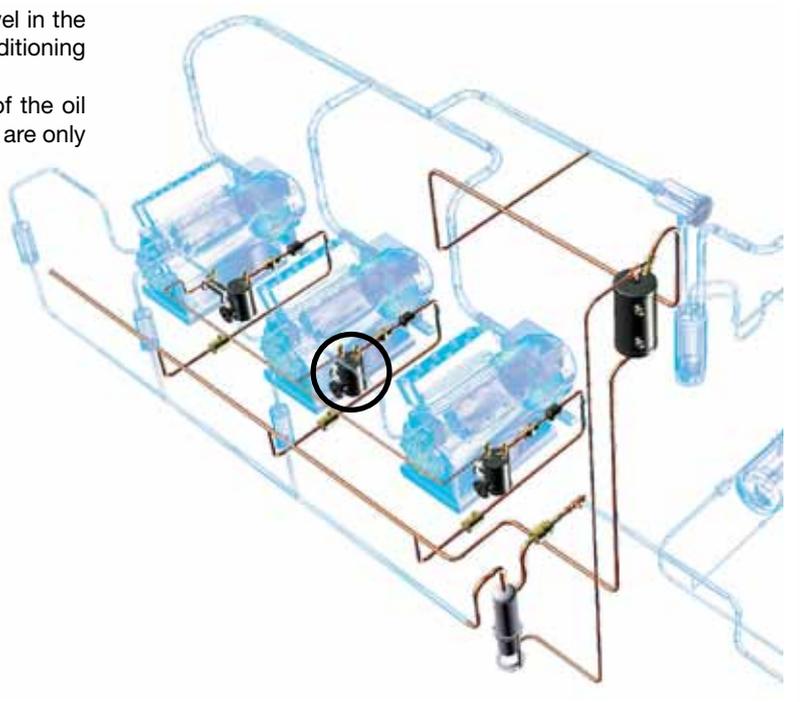


Mechanical oil level regulators and adapters

→ LEVOIL®

■ Applications

- Monitoring and automatic upholding of the optimal oil level in the crankcase of each compressor of refrigeration and air conditioning multi-compressors installations.
- The oil level regulators LEVOIL participate in the return of the oil into the compressors and to their proper functioning; they are only used in low pressure oil return systems.
- They allow the installation of compressors at unequal heights or different level of oil.
- They allow, on the same installation, the connection in parallel of compressors with different cooling capacities or operating at different regimes.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is done with the PED 97/23/EC table, corresponding to a volume-based selection.
- Hermetically sealed outer steel enclosure with paint to ensure a high resistance to corrosion.
- Two connection flanges at 90° on the standard oil level regulator body allow for one, fastening on the compressor boss and for the other, the connection of the oil sight glass originally fixed on the compressor.
- 7 models of regulators with connecting flanges suitable for the main compressors of the market. One of them is adjustable, allowing to precisely adjust the oil level in accordance with the compressors' manufacturer recommendations; this model has also a pressure equalization connection, so the oil level of several compressors mounted in parallel can be equalized.

■ CARLY advantages

- Maximum working pressure 46 bar.
- Optimized range of oil level regulators equipped with two 7 holes universal flanges in order to be mounted on most of compressors available on the market.
- Resistance to higher pressure and limited foaming phenomenon inside the regulator due to the spherical design.
- Internal valve/needle/float oil return system, efficient and reliable. Minimizes the bad effect of foaming and ensures a good stability of the oil level.
- The density and viscosity of oils have nearly no effect on the regulator LEVOIL®.
- Due to the large pressure differential (1bar to 4,5bar), the basic model LEVOIL 23 is suitable for mounting on 2 levels cascade packs (supermarket application).
- Model LEVOIL 33 RE with adjustable ΔP from 1 to 6,5 bar and a pressure equalization connection.
- For the regulators with 7 holes flanges, the visualization of the oil level is facilitated, due to left or right mounting possibilities.
- Installation possible on the right or left side of the compressor, thanks to the centered inlet oil connection.
- Oil inlet connection inclined backwards, in order to avoid the cylinder heads of the compressor.
- Small volume of oil retention in the lower part of the LEVOIL®.
- Wide range of adapters allowing connection of the LEVOIL® on most of the compressors available on the market.
- GOST certified products.



Mechanical oil level regulators and adapters

→ LEVOIL®

■ Functional features

- The sight-glasses' threads of some COPELAND® SCROLL® compressors, types ZB, ZS and ZF, having been changed by the manufacturer in May 2012 and in June 2014, CARLY offers the models of oil level regulators detailed in the chapter **COMPRESSORS / ADAPTERS ASSOCIATIONS**.
- The supplies delivered with the oil level regulators are detailed in the chapter "Technical features".

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the oil level regulators LEVOIL

- The oil level regulators must be bolted on the compressor bosses instead of the original oil level sight glass.
- It is imperative to use the items contained in the installation kit supplied with the regulator. The four-lobes gasket has to be used when connecting a sight glass or an adapter on the regulator (flanges with face to face grooves) see chapter "technical features".
- If the compressor crankcase does not offer a connection matching the flange of the standard oil level regulator, use a HCYN 1A adapter whose connection type will correspond to that of concerned compressors.
- Oil level regulator installation must be done only with the oil inlet located in the upper part.
- The oil receiver enables the feeding of oil level regulators, and it must be mounted two meters minimum above the oil level regulators; if it cannot be, it is necessary to mount a HCYCT – non adjustable – or HCYCTR – adjustable – differential valve on the oil receiver and to connect it to the suction line, in order to maintain overpressure in the receiver, ensuring:
 - continuous and regular oil feed of regulators
 - limitation of the pressure in the oil return line in the oil return line of the feeding
- of the oil level regulators, whose excess would hinder proper operation of regulators and be a source of incidents for the installation.
- Imperatively provide for an oil filter (HCYF, HCYBF or HYDROIL if polyol-ester oils, see chapters 45, 46 and 47) upstream of the oil level regulators in order to stop contaminants from disturbing their good operation.
- In order to perform perfect air-tightness with the connections to screw without gasket, it is recommended to use a thread sealing product.
- For the adjustable oil level regulators models (factory setting 3/4 glass):
 - turn the nut clockwise, to lower the oil level
 - turn the nut counter clockwise, to raise the oil level.
- In some cases, the vibrations generated by the compressors can disturb the oil level regulators operation; it is then imperative to eliminate causes of vibration.
- For correct operation, it is necessary to ensure, after mounting, that the oil level regulators are perfectly horizontal.
- Check that the oil quality is not degrading with time and regularly make some oil acidity tests (TESTOIL-MAS and TESTOIL-POE: refer to chapter 91).
- Ensure that the pressure differential between the oil feeding and the compressor crankcase remains within the range recommended by CARLY.
- To select the optimal oil level, refer to the recommendations given by the compressor manufacturers; most of the time, this reference level is situated between the quarter and the half-sight glass.
- In the case of multi-compressor systems, it is recommended to use oil level regulators with a pressure equalization connection (LEVOIL 33 RE models), in order to get all the compressor crankcases at the same pressure.
- Replace the different gaskets each time the regulators or the sight glasses are taken out (see chapter "Spares parts").
- Replace the oil filter after each intervention on the oil system (change of oil, component replacement, etc...)



Mechanical oil level regulators and adapters

CTCY-EN – 49.1-9 / 08-2015

→ LEVOIL®

■ Technical features

CARLY references	Type of connection	Pressure range bar	Oil inlet connection To screw SAE inch	Pressure equalization connection To screw SAE inch	Adjusted level	Installation kit (delivered with the product)
LEVOIL 22						
	7 holes Ø 6,5 mm	1 - 4,5	1/4"	/	Set ½ glass	4 screw HM6-30 4 nuts M6 4 washers Diam. 6 2 O-ring 1 quadring 1 fitting wedge for 4 holes sight glass
LEVOIL 23						
	7 holes Ø 6,5 mm	1 - 4,5	3/8"	/	Set ½ glass	4 screw HM6-30 4 nuts M6 4 washers Diam. 6 2 O-ring 1 quadring 1 fitting wedge for 4 holes sight glass
LEVOIL 23 BO						
	1" 1/8 - 18 UNEF	1 - 4,5	3/8"	/	Set ½ glass	1 sight glass 1" 1/4 - 12 UNF 2 PTFE gaskets 1 1" 1/8 - 18 UNEF adapter
LEVOIL 23 SC						
	3/4" NPTF	1 - 4,5	3/8"	/	Set ½ glass	1 sight glass 1" 1/4 - 12 UNF 2 PTFE gaskets 1 3/4" NPT adapter
LEVOIL 23 SC2						
	1" 3/4 - 12 UNF	1 - 4,5	3/8"	/	Set ½ glass	1 PTFE gaskets
LEVOIL 23 SU						
	1" 1/4 - 12 UNF	1 - 4,5	3/8"	/	Set ½ glass	2 PTFE gaskets
LEVOIL 33 RE						
	7 holes Ø 6,5 mm	1 - 6,5	3/8"	1/4"	Adjustable between ¼ and ¾ - glass ⁽¹⁾	4 screw HM6-30 4 nuts M6 4 washers Diam. 6 2 O-ring 1 quadring 1 fitting wedge for 4 holes sight glass

See tables page 49.8, 49.9 and 49.10 for regulators and compressors association. ⁽¹⁾ Factory setting 3/4 glass

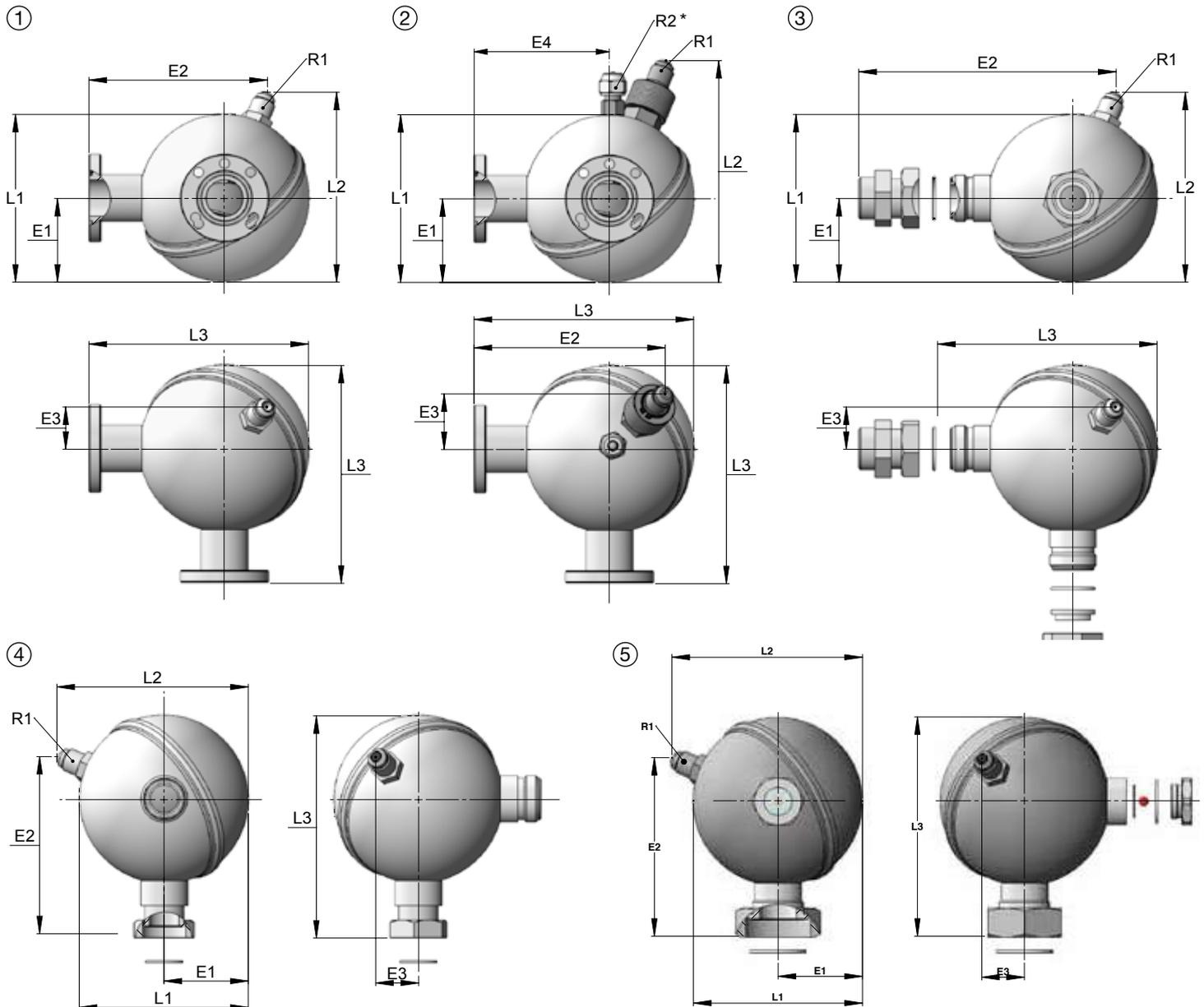


Mechanical oil level regulators and adapters

→ LEVOIL®

■ Technical features

CARLY references	Drawing Nb	Dimensions mm							Connections to flare SAE inch	
		L1	L2	L3	E1	E2	E3	E4	R1	R2
LEVOIL 22	1	115	130	148	58	119	29	/	1/4	/
LEVOIL 23	1	115	130	148	58	119	29	/	3/8	/
LEVOIL 23 B0	3	115	130	204	58	174	29	/	3/8	/
LEVOIL 23 SC	3	115	130	204	58	174	29	/	3/8	/
LEVOIL 23 SC2	5	115	130	150	58	122	29	/	3/8	/
LEVOIL 23 SU	4	115	130	152	58	124	29	/	3/8	/
LEVOIL 33 RE	2	115	157	151	60	131	39	92	3/8	1/4





Mechanical oil level regulators and adapters

→ LEVOIL®

■ Technical features

CARLY references	Volume	Pressure range	Maximal working pressure	Maximal working temperature	Minimal working temperature	CE Category (1)
	V L	ΔP bar	PS bar	TS maxi °C	TS mini °C	
LEVOIL 22	0,8	1 - 4,5	46	120	-20	Art3§3
LEVOIL 23	0,8	1 - 4,5	46	120	-20	Art3§3
LEVOIL 23 BO	0,8	1 - 4,5	46	120	-20	Art3§3
LEVOIL 23 SC	0,8	1 - 4,5	46	120	-20	Art3§3
LEVOIL 23 SC2	0,8	1 - 4,5	46	120	-20	Art3§3
LEVOIL 23 SU	0,8	1 - 4,5	46	120	-20	Art3§3
LEVOIL 33 RE	0,8	1 - 6,5	46	120	-20	Art3§3

(1) Classification by volume, according to PED 97/23/EC (refer to chapter 0).

■ Example of selection

The selection of the oil level regulator **LEVOIL®** implies for the user to take into account all the conditions under which the product will be used (temperature - pressure - refrigerant - oil - external environment etc).

• Refrigerating unit composed of three compressors operating with R404A under the following conditions:

- Compressors n° 1 and 2 $T_o = -10\text{ °C}$ $P_o = 4,4\text{ bar}$
- Compressor n° 3 $T_o = -25\text{ °C}$ $P_o = 2,5\text{ bar}$
- Use of a HCYCT 3 differential valve between the oil receiver and the suction collector that maintains a pressure differential of 1.4 bar.
- Oil level regulation at half glass (according manufacturer's recommendation).
- Inlet oil pipe diameter 3/8".

• Which **LEVOIL®** mechanical oil level regulator to choose?

• Calculation of the oil receiver pressure (P_{RH})

$$P_{RH} = P_o \text{ maxi} + \Delta P \text{ valve}$$

Result: $P_{RH} = 4.4 + 1.4 = 5.8\text{ bar}$

• **LEVOIL®** SELECTION FOR COMPRESSORS NO.1 AND NO.2

The pressure differential between the **HCYR** oil receiver and the common line compressors being of **1.40 bar** (given by the **HCYCT 3** differential valve), a **LEVOIL®** oil level regulator accepting a pressure differential of 1.4 bar has to be mounted on each of these compressors.

Result: LEVOIL 23

• **LEVOIL®** SELECTION FOR COMPRESSOR NO.3

The pressure differential between the **HCYR** oil receiver and compressor No.3 being of $5.8 - 2.5 = 3.3\text{ bar}$, a **LEVOIL®** oil level regulator accepting a pressure differential of 3.3 bar has to be mounted on the compressor.

Result: LEVOIL 23 / LEVOIL 33 RE



Mechanical oil level regulators and adapters

→ HCYN 1A

■ Technical features

HCYN 1A adapters allow connection of CARLY oil level regulators to compressors when it is not possible to connect the universal 7 holes flange directly on the compressors sight glass flange.

CARLY references	Features of compressor connection (sight glass)	Accessories delivered with the adapter	End view from compressor side	Side view compressor on the right
HCYN 1A2	Threads 1 1/8" - 12	1 O-ring 3 screws HM6 - 30 cl 8 - 8 3 nuts HM6 3 washers DEC 6 1 glass 3 trous diameter 60		
HCYN 1A3	3 screws 1/4" diameter 47.6	1 O-ring 3 screws HM6 - 30 cl 8 - 8 3 nuts HM6 3 washers DEC 6		
HCYN 1A5	4 screws 1/4" diameter 50	1 O-ring 3 screws HM6 - 30 cl 8 - 8 3 nuts HM6 3 washers DEC 6 1 glass 3 holes diameter 60		
HCYN 1A7	Threads 1 1/2" - 18	1 O-ring 3 screws HM6 - 30 cl 8 - 8 3 nuts HM6 3 washers DEC 6 1 glass 3 holes diameter 60		
HCYN 1A9	4 screws 1/4" at 90° diameter 50	1 O-ring 3 screws HM6 - 30 cl 8 - 8 3 nuts HM6 3 washers DEC 6 1 glass 3 holes diameter 60		
HCYN 1A10	Threads 1 1/8" - 18	1 O-ring 3 screws HM6 - 30 cl 8 - 8 3 nuts HM6 3 washers DEC 6 1 glass 3 holes diameter 60		
HCYN 1A11	Threads 3/4" NPT	1 O-ring 3 screws HM6 - 30 cl 8 - 8 3 nuts HM6 3 washers DEC 6 1 glass 3 holes diameter 60		
HCYN 1A14	1 3/4 - 12 UNF ROTALOCK	1 O-ring 3 screws HM6 - 30 cl 8 - 8 3 nuts HM6 3 washers DEC 6 1 gasket PTFE 1 glass 3 holes diameter 60		
HCYN 1A15	1 1/4 - 12 UNF ROTALOCK	1 O-ring 3 screws HM6 - 30 cl 8 - 8 3 nuts HM6 3 washers DEC 6 1 gasket PTFE 1 glass 3 holes diameter 60		

See tables page 49.8 and 49.9 for regulators and compressors association.

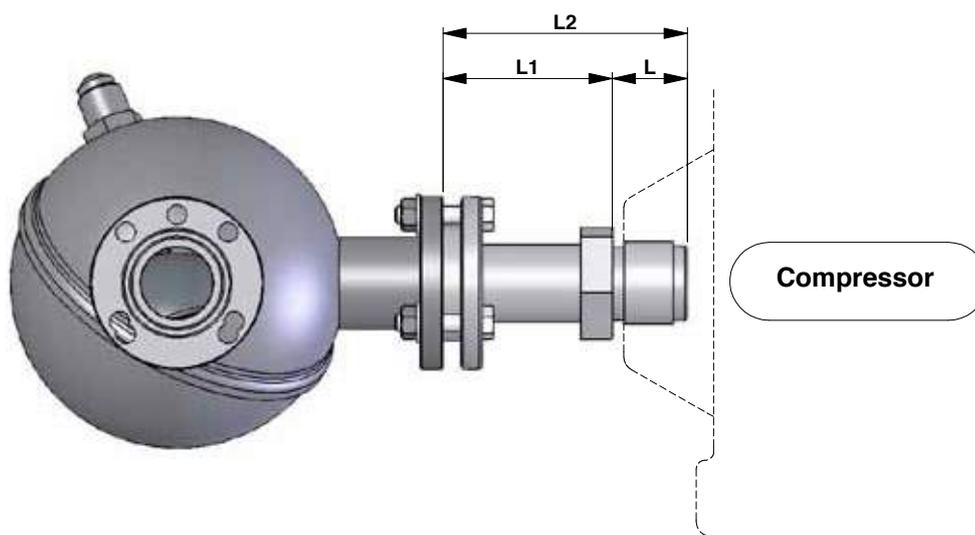


Mechanical oil level regulators and adapters

→ HCYN 1A

■ Technical features

CARLY references	Dimensions mm		
	L1	L2	L
HCYN 1A2	58,5	84,5	26,0
HCYN 1A3	102,0	102,0	/
HCYN 1A5	57,5	82,5	25,0
HCYN 1A7	55,5	82,5	27,0
HCYN 1A9	59,5	63,0	3,5
HCYN 1A10	46,5	57,5	11,0
HCYN 1A11	46,5	72,5	26,0
HCYN 1A14	46,5	72,5	26,0
HCYN 1A15	46,5	72,5	26,0



CARLY references	Nominal Diameter	Maximal working pressure	Maximal working temperature	Minimal working temperature	CE Category (1)
	DN mm	PS bar	TS maxi °C	TS mini °C	
HCYN 1A2	21,7	46	120	-20	Art3§3
HCYN 1A3	21,7	46	120	-20	Art3§3
HCYN 1A5	21,7	46	120	-20	Art3§3
HCYN 1A7	21,7	46	120	-20	Art3§3
HCYN 1A9	21,7	46	120	-20	Art3§3
HCYN 1A10	21,7	46	120	-20	Art3§3
HCYN 1A11	21,7	46	120	-20	Art3§3
HCYN 1A14	21,7	46	120	-20	Art3§3
HCYN 1A15	21,7	46	120	-20	Art3§3

(1) Classification by diameter, according to PED 97/23/EC (refer to chapter 0).



Mechanical oil level regulators and adapters

→ LEVOIL® + HCYN 1A

■ Compressors / Adapters associations

Compressor		Type of connection	Oil level regulator	Oil level regulator + adapter	BOOSTER application LP oil level regulator	Adjustable oil level regulator	Oil level regulator with equalisation
Brand	Range		1,0 bar < Δp < 4,5 bar		1,0 bar < Δp < 4,5 bar	1,0 bar < Δp < 6,5 bar	1,0 bar < Δp < 6,5 bar
BITZER	2CC --> 2KC 2CHC --> 2JHC	1" 1/8 - 18 UNEF	LEVOIL 23 B0	LEVOIL 22/23 + HCYN 1A10	LEVOIL 23 B0	LEVOIL 33 RE + HCYN 1A10	LEVOIL 33 RE + HCYN 1A10
	4CC --> 4FC, 4CHC --> 4FHC, 4NFR --> 4UFR, NFC --> UFC						
	ESH						
	2N, 2T, 4N, 4T, 4P, 4U, 4Z	4 holes in Ø 50 mm	LEVOIL 22/23	LEVOIL 22/23 (+ HCYN 1A5 for CP before 05/1997)	LEVOIL 22/23 (+ HCYN 1A5 for CP before 05/1997)	LEVOIL 33 RE (+ HCYN 1A5 for CP before 05/1997)	LEVOIL 33 RE (+ HCYN 1A5 pour CP before 05/1997)
	4FE, 4G, 4H, 4J, 4JE, 6F, 6G, 6H, 6J, W						
	S4, S6, S66						
	8D, 8E						
	4NC(S) --> 4VC(S), 4NHC --> 4VHC, 4NES --> 4VES, 4NDC --> 4VDC	3 holes in Ø 47,6 mm	LEVOIL 22/23	/	LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE
	6D, 6E						
	8FC, 8GC						
	GSD 8	1" 3/4 - 12 UNF	LEVOIL 23SC2	LEVOIL 22/23 + HCYN 1A14	LEVOIL 22/23 + HCYN 1A14	LEVOIL 33 RE + HCYN 1A14	LEVOIL 33 RE + HCYN 1A14
BOCK	HA, HG, HGX (4, 5, 6)	3 holes in Ø 47,6 mm	LEVOIL 22/23	/	LEVOIL 22/23	LEVOIL 33RE	LEVOIL 33RE
	HG (7, 8) HGZ						
	EX	1" 1/8 - 18 UNEF	LEVOIL 23 B0	LEVOIL 22/23 + HCYN 1A10	LEVOIL 23 B0	LEVOIL 33 RE + HCYN 1A10	LEVOIL 33 RE + HCYN 1A10
	HA, HG, HGX (12, 22, 34)						
	AM (2 --> 5)						
	F (2 --> 16)	4 holes in Ø 50 mm	/	LEVOIL 22/23 + HCYN 1A9	LEVOIL 22/23 + HCYN 1A9	LEVOIL 33 RE + HCYN 1A9	LEVOIL 33 RE + HCYN 1A9
CARRIER	EA, ER, 6E, OBE, OBCC	3 holes in Ø 47,6 mm	LEVOIL 22/23	/	LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE
	DA, DR, 5F, 5H, 6D, 6E	1" 1/2 - 18 UNEF	/	LEVOIL 22/23 + HCYN 1A7	LEVOIL 22/23 + HCYN 1A7	LEVOIL 33 RE + HCYN 1A7	LEVOIL 33 RE + HCYN 1A7



Mechanical oil level regulators and adapters

➔ LEVOIL® + HCYN 1A

■ Compressors / Adapters associations

Compressor		Type of connection	Oil level regulator	Oil level regulator + adapter	BOOSTER application LP oil level regulator	Adjustable oil level regulator	Oil level regulator with equalisation
Brand	Range		1,0 bar < Δp < 4,5 bar		1,0 bar < Δp < 4,5 bar	1,0 bar < Δp < 6,5 bar	1,0 bar < Δp < 6,5 bar
COPELAND	DK, DL, DN, ZR, ZZ	1" 1/8 - 12 UNF	/	LEVOIL 22/23 + HCYN 1A2	LEVOIL 22/23 + HCYN 1A2	LEVOIL 33 RE + HCYN 1A2	LEVOIL 33 RE + HCYN 1A2
	D2, D3, D4, D6, 4CC, 6CC	3 holes in Ø 47,6 mm	LEVOIL 22/23		LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE
	D8, 8CC		/	LEVOIL 33 RE + HCYN 1A3 (1/4 of sight glass)	LEVOIL 33 RE + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3
	ZB, ZBD (15 --> 48) (before 7/2014) ZS (15 --> 45) ZB, ZS 11/56/75/92 (before 5/2012) ZF 24 --> 48 (before 5/2012) ZF-K4E/KVE 06 --> 25 (before 7/2014) ZFD-K4E/KVE 13 --> 18 (before 7/2014) Z0	3/4" - 14 NPTF	LEVOIL 23 SC	LEVOIL 22/23 + HCYN 1A11	LEVOIL 23 SC	LEVOIL 33 RE + HCYN 1A11	LEVOIL 33 RE + HCYN 1A11
	ZR 11 --> 19, 90 ZR 94 --> 380 (after 8/2009) ZP 180, 235 --> 485 (after 8/2009) ZB, ZS 11/56/75/92/220 (after 5/2012) ZH (after 8/2009) ZF 24 --> 48 (after 5/2012)	1" 3/4 - 12 UNF ROTALOCK	LEVOIL 23 SC2	LEVOIL 22/ 23 + HCYN 1A14	LEVOIL 22/ 23 + HCYN 1A14	LEVOIL 33 RE + HCYN 1A14	LEVOIL 33 RE + HCYN 1A14
	ZR 94/108/125/144/160/190 (before 8/2009) ZB 15 --> 48 (after 7/2014) ZBD 21 --> 45 (after 7/2014) ZF-K4E/KVE 06 --> 25 (after 7/2014) ZFD-K4E/KVE 13 --> 18 (after 7/2014) ZB 50 --> 114 ZP 90 --> 182 (after 2007)	1" 1/4 - 12 UNF ROTALOCK	LEVOIL 23 SU	LEVOIL 22/23 + HCYN 1A15	LEVOIL 22/23 + HCYN 1A15	LEVOIL 33 RE + HCYN 1A15	LEVOIL 33 RE + HCYN 1A15
DANFOSS	MLM / MLZ / MFZ / LFZ / LLZ	1"1/8 - 18 UNEF	LEVOIL 23 B0	LEVOIL 22/23 + HCYN 1A10	LEVOIL 23 B0	LEVOIL 33 RE + HCYN 1A10	LEVOIL 33 RE + HCYN 1A10
	SH (090-->161)	1"3/4-12 UNF ROTALOCK	/	LEVOIL 22/23 + HCYN 1A14	LEVOIL 22/23 + HCYN 1A14	LEVOIL 33 RE + HCYN 1A14	LEVOIL 33 RE + HCYN 1A14
DORIN	H1, K (40CC --> 280CC) Hi (100-->240) SCC (180B-->280B)	1"1/8 - 18 UNEF	LEVOIL 23 B0	LEVOIL 22/23 + HCYN 1A10	LEVOIL 23 B0	LEVOIL 33 RE + HCYN 1A10	LEVOIL 33 RE + HCYN 1A10
	H2, H32, H4K, K4, K5, K6, KP, 2S, Y6, SC SCC (500 -->2500B) Hi (400 --> 1500)	3 holes in Ø 47,6 mm	LEVOIL 22/23		LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE
	K7, K8, Y7	3 holes in Ø 47,6 mm	/	LEVOIL 22/23 + HCYN 1A3	LEVOIL 22/23 + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3
DUNHAM-BUSH	B6	3 holes in Ø 47,6 mm	LEVOIL 22/23		LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE



Mechanical oil level regulators and adapters

➔ LEVOIL® + HCYN 1A

■ Compressors / Adapters associations

Compressor		Type of connection	Oil level regulator	Oil level regulator + adapter	BOOSTER application LP oil level regulator	Adjustable oil level regulator	Oil level regulator with equalisation
Brand	Range		1,0 bar < Δp < 4,5 bar		1,0 bar < Δp < 4,5 bar	1,0 bar < Δp < 6,5 bar	1,0 bar < Δp < 6,5 bar
FRASCOLD	A,B,D,F,S,V,Z A-SK --> S-SK	3 holes in Ø 47,6 mm	LEVOIL 22/23		LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE
	W	3 holes in Ø 47,6 mm	/	LEVOIL 22/23 + HCYN 1A3	LEVOIL 22/23 + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3
MANEUROP	All compressors with sight glass	1"1/8 - 18 UNEF	LEVOIL 23 B0	LEVOIL 22/23 + HCYN 1A10	LEVOIL 23 B0	LEVOIL 33 RE + HCYN 1A10	LEVOIL 33 RE + HCYN 1A10
PRESTCOLD	PK, PL	1"1/8 - 12 UNF	/	LEVOIL 22/23 + HCYN 1A2	LEVOIL 22/23 + HCYN 1A2	LEVOIL 33 RE + HCYN 1A2	LEVOIL 33 RE + HCYN 1A2
	P	3 holes in Ø 47,6 mm	LEVOIL 22/23		LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE
	P8, P08	3 holes in Ø 47,6 mm	/	LEVOIL 22/23 + HCYN 1A3	LEVOIL 22/23 + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3
REFCOMP	SP	3 holes in Ø 47,6 mm	LEVOIL 22/23		LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE
	SP (8 cyl)	3 holes in Ø 47,6 mm	/	LEVOIL 22/23 + HCYN 1A3	LEVOIL 22/23 + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3	LEVOIL 33 RE + HCYN 1A3
TECUMSEH EUROPE	All compressors with sight glass	1"1/8 - 18 UNEF	LEVOIL 23 B0	LEVOIL 22/23 + HCYN 1A10	LEVOIL 23 B0	LEVOIL 33 RE + HCYN 1A10	LEVOIL 33 RE + HCYN 1A10
	SCROLL VSA	3/4-14 NPTF	LEVOIL 23 SC	LEVOIL 22/23 + HCYN 1A11	LEVOIL 23 SC	LEVOIL 33 RE + HCYN 1A11	LEVOIL 33 RE + HCYN 1A11
TRANE	M, R	3 holes in Ø 47,6 mm	LEVOIL 22/23		LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE
	K	3/4-14 NPTF	LEVOIL 23 SC	LEVOIL 22/23 + HCYN 1A11	LEVOIL 23 SC	LEVOIL 33 RE + HCYN 1A11	LEVOIL 33 RE + HCYN 1A11
YORK	GC, GS, JS	3 holes in Ø 47,6 mm	LEVOIL 22/23		LEVOIL 22/23	LEVOIL 33 RE	LEVOIL 33 RE

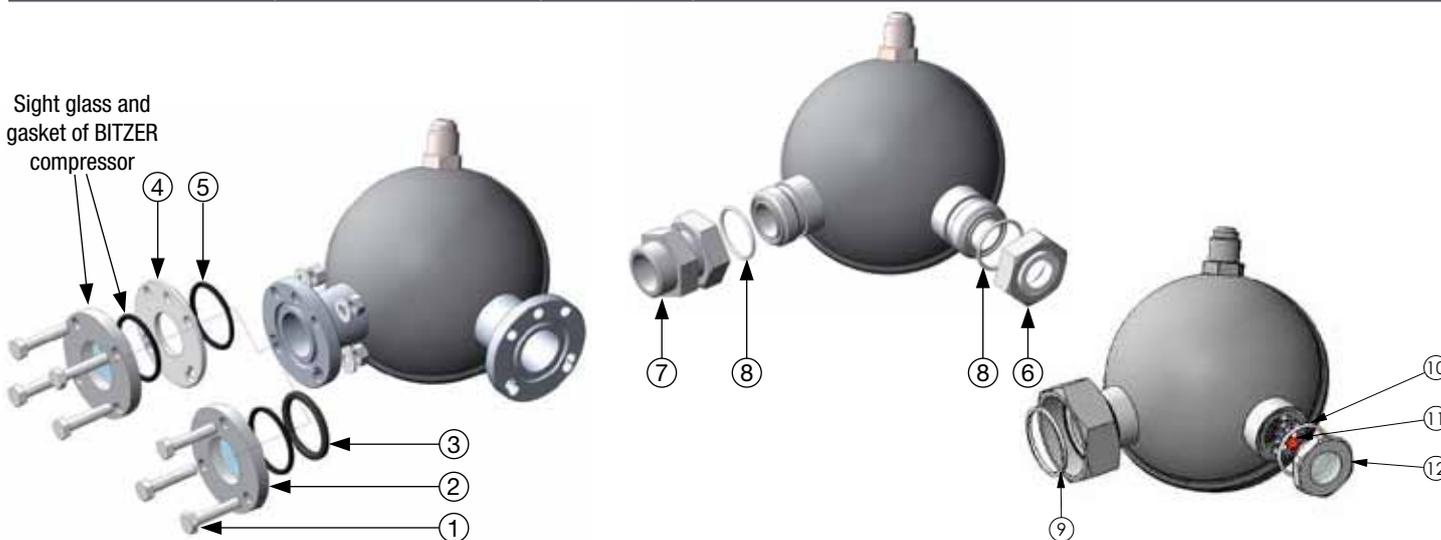


Mechanical oil level regulators and adapters

→ LEVOIL® + HCYN 1A

■ Spare parts

CARLY references		Part Nb	Description
Regulators	Spare parts		
LEVOIL 22 / 23 / 33 RE	HCYN 1V1	2	Oil level sight glass for standard flange (3 holes)
LEVOIL 22 / 23 / 33 RE	HCYN 1V1K	1+2+3+5	Bolts (1) + Glass (2) + gaskets (3, 5)
LEVOIL 22 / 23 / 33 RE	CY 29900130	1+3+4+5	Bolts (1) + intermediate disk (4) + gaskets (3, 5)
LEVOIL 22 / 23 / 33 RE	CY 15552000	3	Quad ring
LEVOIL 22 / 23 / 33 RE	CY 15552190	5	O-ring
LEVOIL 23 SC / 23 B0 / 23 SU	CY 12850080	6	Sight glass 1" 1/4 ROTALOCK
LEVOIL 23 B0	CY 17637550	7	1" 1/8 -18 UNEF adapter
LEVOIL 23 SC	CY 17637490	7	3/4" NPT adapter
LEVOIL 23 SC / 23 B0 / 23 SU	CY 15580120	8	PTFE gasket
LEVOIL 23 SC2	CY 15580160	9	Gasket for 1" 3/4 ROTALOCK connection
LEVOIL 23 SC2	CY 15552180	10	O-ring PTFE gasket for sight glass
LEVOIL 23 SC2	CY 10501000	11	Colour ball for level visualization
LEVOIL 23 SC2	CY 35012150	12	Glass without moisture indicator



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
LEVOIL 22	1,33	1,15	1
LEVOIL 23	1,33	1,16	1
LEVOIL 23 B0	1,26	0,95	1
LEVOIL 23 SC	1,27	1,10	1
LEVOIL 23 SC2	1,33	1,26	1
LEVOIL 23 SU	1,06	0,98	1
LEVOIL 33 RE	1,50	1,32	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYN 1A2	0,48	0,48	1
HCYN 1A3	0,50	0,50	1
HCYN 1A5	0,56	0,56	1
HCYN 1A7	0,58	0,58	1
HCYN 1A9	0,57	0,57	1
HCYN 1A10	0,40	0,40	1
HCYN 1A11	0,46	0,46	1
HCYN 1A14	0,50	0,50	1
HCYN 1A15	0,42	0,42	1

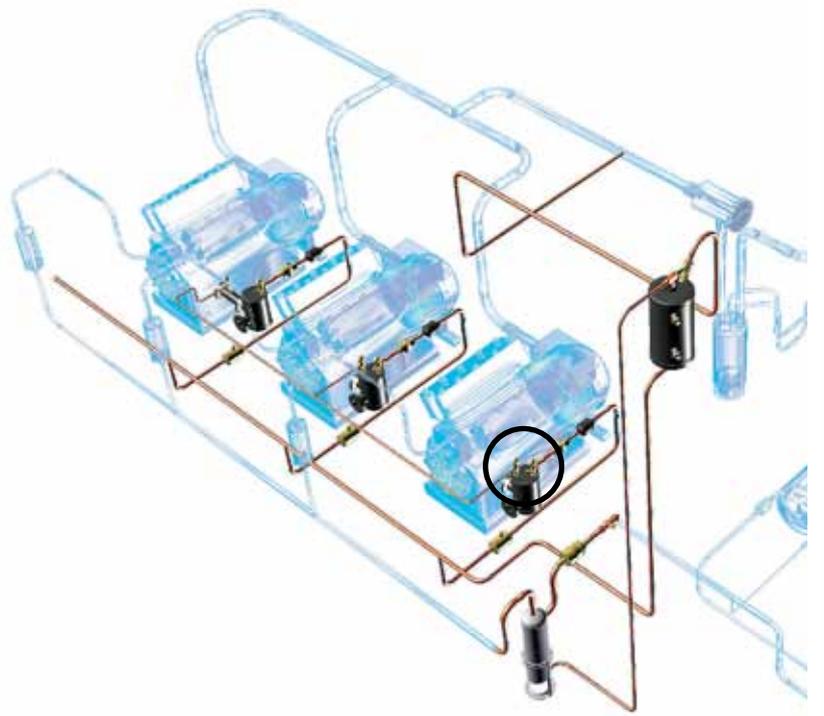


Isolation valves for oil level regulators

→ HCYVI

■ Applications

- Isolation of LEVOIL oil level regulators of refrigerating and air conditioning installations, in order to facilitate the oil line maintenance operations.



■ Functional features

- Products are compatible with HFCs, HCFCs, CFCs, CO₂ as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 - Propane R290, Butane R600, Isobutane R600a, Propylene R1270 - with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- 8 mm square section inspection rod to be handled with appropriate tool.
- Neoprene® internal O-rings.
- Delivered with a copper gasket for the revolving side of the nut.

■ CARLY advantages

- Maximum working pressure.
- Those isolation valves may be mounted on low and high pressure (up to 46 bar) oil return systems.
- Connection to the 360° adjustable oil level regulator thanks to a revolving nut.
- The body and internal needle valve in brass, combined with a robust stainless steel dudgeon guarantee a perfect resistance to corrosion.
- Fully waterproof screwed cap protects against any accidental operation of the adjustment rod.
- Possibility to have vertical and horizontal valves (H in 3/8" version with compact size in height).
- GOST certified products.



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Isolation valves for oil level regulators

→ HCYVI

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

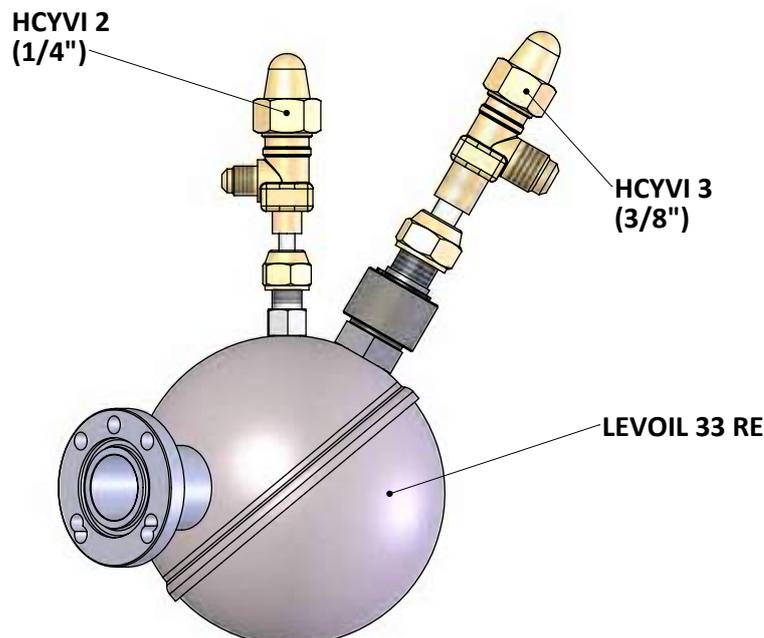
RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the isolation valves HCYVI

- The isolation valves are to be mounted on the oil level regulators:
 - HCYVI 3 : on the 3/8" SAE oil inlet connection
 - HCYVI 2 : on the 1/4" SAE pressure equalization connection and oil inlet (LEVOIL 22)
- The tightening of the isolation valves must imperatively be made with two open-end spanners, in order to avoid the twisting of the pipes, and the deterioration of their brass body (tightening with pliers proscribed).
- During installation of the isolation valves, carefully watch the correct positioning of the supplied copper seals.
- After every disassembly of the isolation valves, it is imperative to replace the copper gasket before the re-assembly.





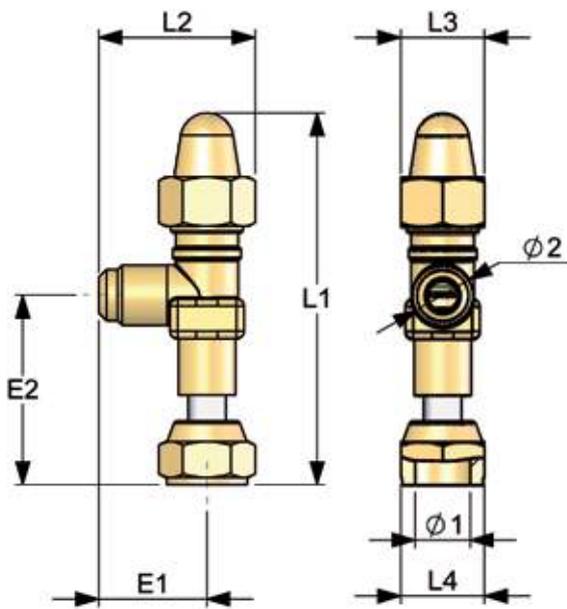
Isolation valves for oil level regulators

→ HCYVI

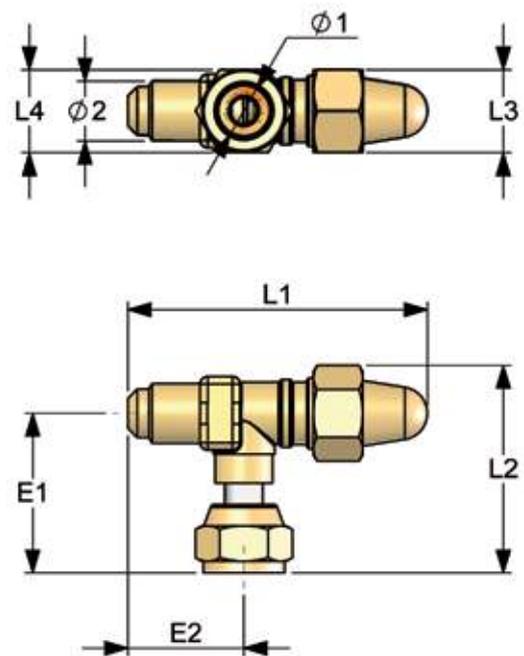
■ Technical features

CARLY references	Connections To screw SAE		Drawing Nb	Dimensions mm					
	Ø1 inch	Ø2 inch		L1	L2	L3 upper faces	L4 upper faces	E1	E2
HCYVI 2	1/4	1/4	1	88	37	22	17	25	41
HCYVI 3	3/8	3/8	1	98	41	22	22	29	51
HCYVI 3H	3/8	3/8	2	78	56	22	22	44	31

①



②



CARLY references	Nominal Diameter	Maximal working pressure	Working pressure (1)	Maximal working temperature	Minimal working temperature	Working temperature (1)	CE Category (2)
	DN inch	PS bar	PS BT bar	TS maxi °C	TS mini °C	TS BT °C	
HCYVI 2	1/4	46	/	120	-20	/	Art3§3
HCYVI 3	3/8	46	/	120	-20	/	Art3§3
HCYVI 3H	3/8	46	/	120	-20	/	Art3§3

(1) The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

(2) Classification by diameter, according to PED 97/23/EC (refer to chapter 0).



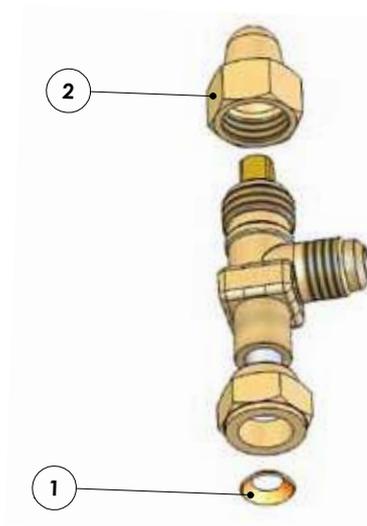
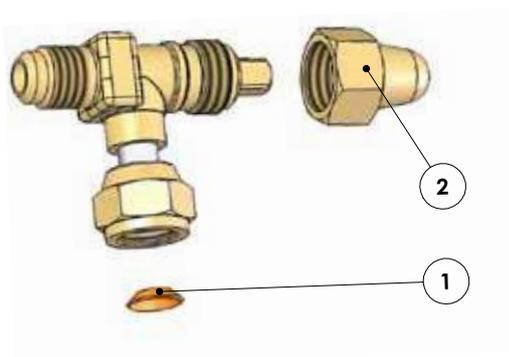
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Isolation valves for oil level regulators

→ HCYVI

■ Spare parts

CARLY references		Part N°	Description	Quantity
Isolation valves for oil level regulators	Spare parts			
HCYVI 2 / HCYVI 2H	CY 15590010	1	Set of 25 taper copper gaskets for 1/4" SAE connection	1
HCYVI 3 / HCYVI 3H	CY 15590020	1	Set of 25 taper copper gaskets for 3/8" SAE connection	1
HCYVI 2 / HCYVI 2H HCYVI 3 / HCYVI 3H	CY 10850030	2	Cap for adjustment rod	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYVI 2	0,11	0,11	1
HCYVI 3	0,20	0,20	1
HCYVI 3H	0,16	0,16	1

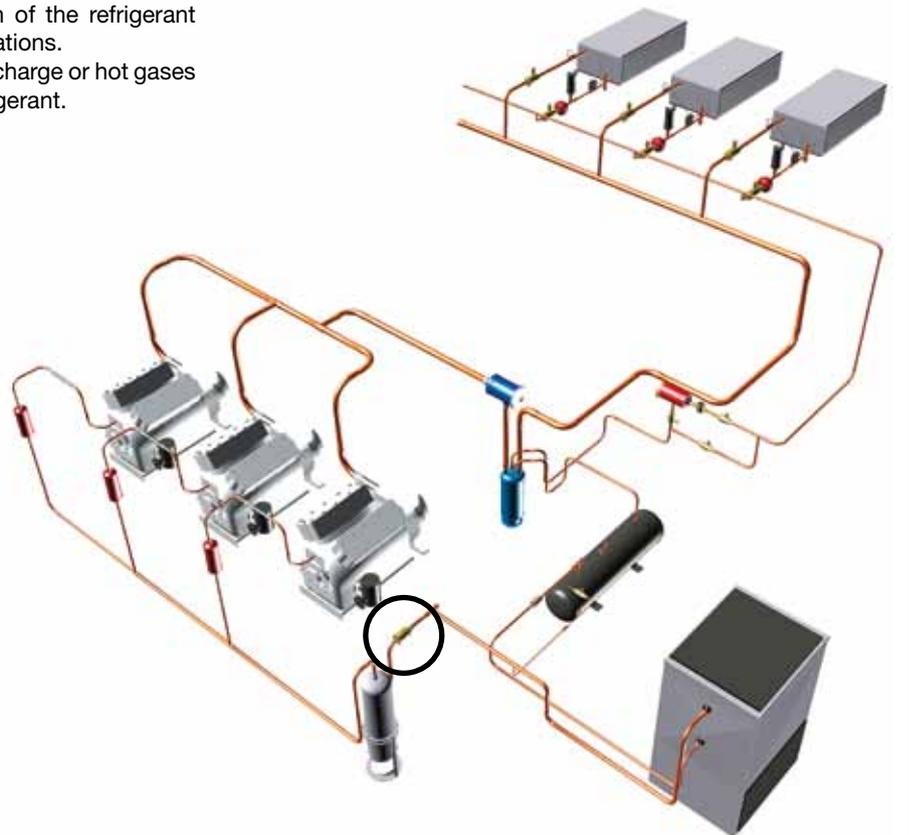


Check valves

→ CRCY

■ Applications

- The check valves ensure a one-way direction of the refrigerant flow, in refrigerating and air conditioning installations.
- They can be mounted on the liquid, suction, discharge or hot gases defrost line, to prevent unwanted return of refrigerant.



■ Functional features

- Products are compatible with CFCs, HCFCs, HFCs, CO₂s, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 – Propane R290, Butane R600, Isobutane R600a, Propylene R1270 – with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- The brass body of the valves ensures perfect resistance to corrosion.
- An arrow indicating the refrigerant flow direction is engraved on the brass body of the valve.
- 10 models with connections to braze (from 1/4" to 7/8" and from 6 to 22 mm).
- The long copper sleeves allow quick and safe brazing of connections.

■ CARLY advantages

- Maximum working pressure 46 bar.
- The check valves can be installed in all positions.
- They are equipped with an internal pulse absorber piston, with PTFE gasket.
- Pressure drops are negligible.
- Perfect air tightness ensured by a TIG brass weld of the body.
- Thanks to their reduced weight, the check valves CRCY requires no specific fixing.
- GOST certified products.



Check valves

→ CRCY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the check valves CRCY

- The check valves are to be mounted in any position on the suction, discharge and liquid lines of the installation.
- The fluid flow direction is indicated by an arrow engraved on the brass body of the valve. It must imperatively be respected.
- In order to avoid any phenomenon of internal beat, never over-size a check valve compared to the diameter of piping concerned.
- Always cool the valve body when brazing the copper sleeves with a damp cloth,

or by using the calories discharger CARLYCOOL (refer to chapter 95). Indeed, excessive overheating of the valve may damage the internal PTFE gasket and make it inoperative.

■ Selection table CRCY

CARLY references	Connections To solder ODF		Refrigerating capacity kW ⁽¹⁾															Δ P ⁽²⁾ bar	kv ⁽³⁾ m ³ /h
			Liquid					Suction compressor					Compressor discharge line						
			R22	R134a	R404A R507 R407F	R407C R410A	R744 ⁽⁴⁾ CO ₂	R22 R407F	R134a	R404A R507	R407C R410A	R744 ⁽⁴⁾ CO ₂	R22 R407F	R134a	R404A R507	R407C R410A	R744 ⁽⁴⁾ CO ₂		
CRCY 2 S	1/4		12,5	11,6	8,2	11,5	14,9	1,9	1,5	1,5	1,8	6,6	8,2	6,0	6,9	8,8	10,2	0,06	0,69
CRCY 2 MMS		6	12,5	11,6	8,2	11,5	14,9	1,9	1,5	1,5	1,8	6,6	8,2	6,0	6,9	8,8	10,2	0,06	0,69
CRCY 3 S	3/8		31,7	29,3	20,8	29,2	37,7	4,7	3,8	3,8	4,5	16,8	20,8	15,1	17,5	22,2	25,8	0,06	1,75
CRCY 3 MMS		10	31,7	29,3	20,8	29,2	37,7	4,7	3,8	3,8	4,5	16,8	20,8	15,1	17,5	22,2	25,8	0,06	1,75
CRCY 4 S	1/2		59,2	54,8	38,9	54,6	70,4	8,8	7,1	7,1	8,4	31,5	38,0	28,3	32,7	40,6	47,1	0,05	3,27
CRCY 4 MMS		12	59,2	54,8	38,9	54,6	70,4	8,8	7,1	7,1	8,4	31,5	38,0	28,3	32,7	40,6	47,1	0,05	3,27
CRCY 5 S/MMS	5/8	16	65,9	61,0	43,3	60,7	78,4	9,8	7,9	7,9	9,3	35,1	43,3	31,5	36,4	46,3	53,7	0,05	3,64
CRCY 6 S	3/4		125,5	116,1	82,4	115,7	149,3	18,7	15,0	15,0	17,8	66,9	82,4	59,9	69,3	88,0	102,2	0,03	6,93
CRCY 6 MMS		18	125,5	116,1	82,4	115,7	149,3	18,7	15,0	15,0	17,8	66,9	82,4	59,9	69,3	88,0	102,2	0,03	6,93
CRCY 7 S/MMS	7/8	22	136,4	126,4	89,8	125,7	162,3	20,5	16,3	17,0	19,5	73,4	87,5	63,8	75,0	93,5	108,5	0,03	7,50

⁽¹⁾ **Warning:**

Liquid/Compressor discharge: refrigerating capacity calculated with a flow rate corresponding to a pressure drop of 0.15 bar for To = 4°C and Tk = 38°C.

Compressor suction line: refrigerating capacity according to Standard ARI 730-2001. Flow rate corresponding to a pressure drop of 1 bar suction temperature = 18°C.

⁽²⁾ i.e. the minimum pressure difference for which the check valve remains fully open.

⁽³⁾ i.e. the flow rate in m³/hr for a pressure drop in the check valve of 1 bar (refrigerant used: water with per volume ratio = 1.000 kg/m³).

⁽⁴⁾ Refrigerating capacity Qn for Tk = -10°C and To = -40°C

For Tk = 0 °C Qo = Qn + 12 %,
For Tk = -20 °C Qo = Qn - 10 %,

For To = -30 °C Qo = Qn - 2 %,
For To = -20 °C Qo = Qn - 6 %,

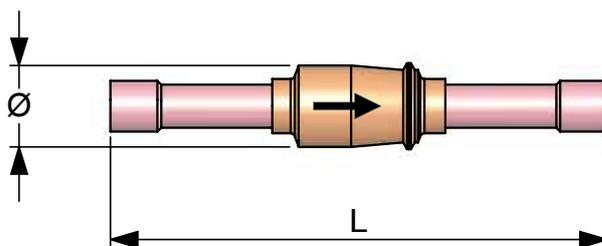


Check valves

→ CRCY

■ Technical features

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Dimensions mm	
				Ø	L
CRCY 2 S	1/4	CRCY 2 MMS	6	18	92
CRCY 3 S	3/8	CRCY 3 MMS	10	18	109
CRCY 4 S	1/2	CRCY 4 MMS	12	27	131
CRCY 5 S/MMS	5/8	CRCY 5 S/MMS	16	27	138
CRCY 6 S	3/4	CRCY 6 MMS	18	36	158
CRCY 7 S/MMS	7/8	CRCY 7 S/MMS	22	36	180



CARLY references	Nominal diameter	CARLY references	Nominal diameter	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	DN inch		DN mm						
CRCY 2 S	1/4	CRCY 2 MMS	6	46	15	120	-40	-30	Art3§3
CRCY 3 S	3/8	CRCY 3 MMS	10	46	15	120	-40	-30	Art3§3
CRCY 4 S	1/2	CRCY 4 MMS	12	46	15	120	-40	-30	Art3§3
CRCY 5 S/MMS	5/8	CRCY 5 S/MMS	16	46	15	120	-40	-30	Art3§3
CRCY 6 S	3/4	CRCY 6 MMS	18	46	15	120	-40	-30	Art3§3
CRCY 7 S/MMS	7/8	CRCY 7 S/MMS	22	46	15	120	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0).



Check valves

→ CRCY

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CRCY 2 S & MMS	0,06	0,05	1
CRCY 3 S & MMS	0,09	0,06	1
CRCY 4 S & MMS	0,14	0,13	1
CRCY 5 S/MMS	0,21	0,20	1
CRCY 6 S & MMS	0,26	0,24	1
CRCY 7 S/MMS	0,28	0,25	1



Check valves

→ CRCY-P9 / 90 bar (1305 psig)

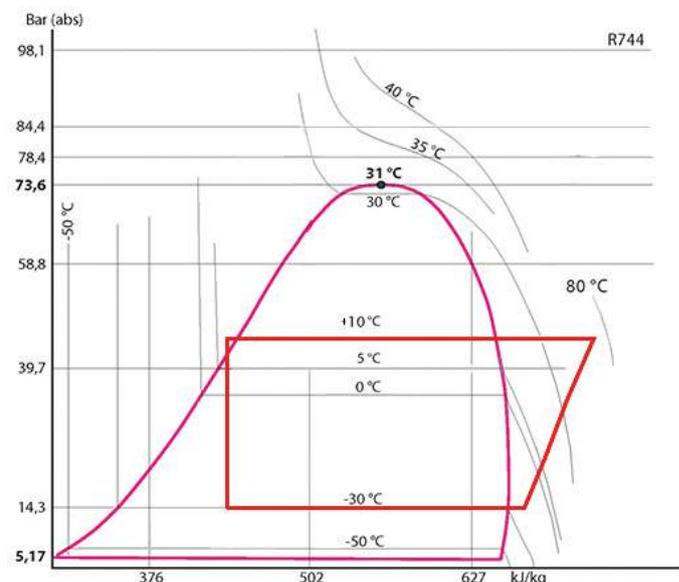
■ Applications

- The check valves ensure a one-way direction of the refrigerant flow, in refrigerating and air conditioning installations, running with high working pressures.
- They can be mounted on the liquid, suction, discharge or hot gases defrost line, to prevent unwanted return of refrigerant.



90 bar

CO₂ SUBCRITICAL AND TRANSCRITICAL



■ Functional features

- Products are compatible with HFC and CO₂, as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- The brass body of the valves ensures perfect resistance to corrosion.
- An arrow indicating the refrigerant flow direction is engraved on the brass body of the valve.
- 4 models with connections to braze (from 1/4" to 5/8" and from 6 to 16 mm).

■ CARLY advantages

- Maximum working pressure : up to 90 bar with CO₂ in subcritical and transcritical compression systems.
- The check valves can be installed in all positions.
- They are equipped with an internal pulse absorber piston, with PTFE gasket.
- Pressure drops are negligible.
- Perfect air tightness ensured by a TIG brass weld of the body.
- Thanks to their reduced weight, the check valves CRCY-P9 requires no specific fixing.



Check valves

→ CRCY-P9 / 90 bar (1305 psig)

■ Warning

Before selecting or installing any component, please refer to the chapter 0 of CARLY technical catalogue - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component,
- Other are general to all CARLY components,

and in this case, they are specified in the **RECOMMENDATIONS SPECIFIC** part defined hereafter ;

they are presented in the chapter 115 of CARLY technical catalogue – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the check valves CRCY-P9

- The check valves are to be mounted in any position on the suction, discharge and liquid lines of the installation.
- The fluid flow direction is indicated by an arrow engraved on the brass body of the valve. It must imperatively be respected.
- In order to avoid any phenomenon of internal beat, never over-size a check valve compared to the diameter of piping concerned.
- Always cool the valve body when brazing the copper sleeves with a damp cloth, or by using the calories discharger CARLYCOOL (refer to chapter 95 of CARLY technical catalogue). Indeed, excessive overheating of the valve may damage the internal PTFE gasket and make it inoperative.



Check valves

→ CRCY-P9 / 90 bar (1305 psig)

■ Special precautions for components used with CO₂ in sub. and transcritical systems

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The hot gas defrost, frequently used with CO₂ for low temperatures applications, generates also high pressures (to take in consideration)
- The implementation on the liquid line of a filter drier **DCY-P14**, or a filter drier shell **BCY-P14** equipped with drying cores **CCY 48 HP** or **PLATINIUM 48**, is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice and even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly check valves CRCY-P9 do not have polymer gaskets.

■ Selection table CRCY-P9

CARLY references	Connections To solder ODF		Δ P ⁽¹⁾ bar	kv ⁽²⁾ m ³ /h
	inch	mm		
CRCY-P9 2 S/MMS	1/4	6	0,06	0,69
CRCY-P9 3 S/MMS	3/8	10	0,06	1,75
CRCY-P9 4 S/MMS	1/2	12	0,05	3,27
CRCY-P9 5 S/MMS	5/8	16	0,05	3,64

⁽¹⁾ i.e. the minimum pressure difference for which the check valve remains fully open.

⁽²⁾ i.e. the flow rate in m³/hr for a pressure drop in the check valve of 1 bar (refrigerant used: water with per volume ratio = 1.000 kg/m³).

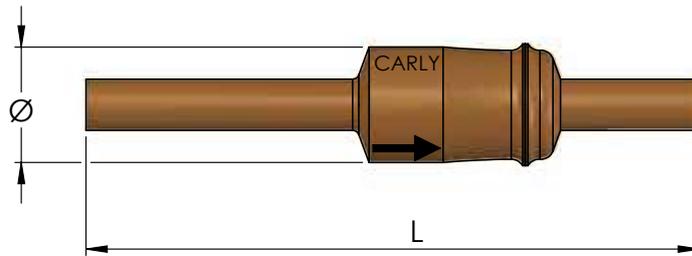


Check valves

→ CRCY-P9 / 90 bar (1305 psig)

■ Technical features

CARLY references	Connections To solder ODF inch	CARLY references	Connections To solder ODF mm	Dimensions mm	
				Ø	L
CRCY-P9 2 S/MMS	1/4	CRCY-P9 2 S/MMS	6	18	95
CRCY-P9 3 S/MMS	3/8	CRCY-P9 3 S/MMS	10	18	95
CRCY-P9 4 S/MMS	1/2	CRCY-P9 4 S/MMS	12	27	117
CRCY-P9 5 S/MMS	5/8	CRCY-P9 5 S/MMS	16	27	117



CARLY references	Nominal diameter	CARLY references	Nominal diameter	Maximal working pressure	Working pressure ⁽¹⁾	Maximal working temperature	Minimal working temperature	Working temperature ⁽¹⁾	CE Category ⁽²⁾
	DN inch		DN mm						
CRCY-P9 2 S/MMS	1/4	CRCY-P9 2 S/MMS	6	90	15	140	-40	-30	Art3§3
CRCY-P9 3 S/MMS	3/8	CRCY-P9 3 S/MMS	10	90	15	140	-40	-30	Art3§3
CRCY-P9 4 S/MMS	1/2	CRCY-P9 4 S/MMS	12	90	15	140	-40	-30	Art3§3
CRCY-P9 5 S/MMS	5/8	CRCY-P9 5 S/MMS	16	90	15	140	-40	-30	Art3§3

⁽¹⁾ The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

⁽²⁾ Classification by diameter, according to PED 97/23/EC (refer to chapter 0 to CARLY technical catalogue).

■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CRCY-P9 2 S/MMS	0,07	0,06	1
CRCY-P9 3 S/MMS	0,07	0,06	1
CRCY-P9 4 S/MMS	0,16	0,15	1
CRCY-P9 5 S/MMS	0,21	0,20	1

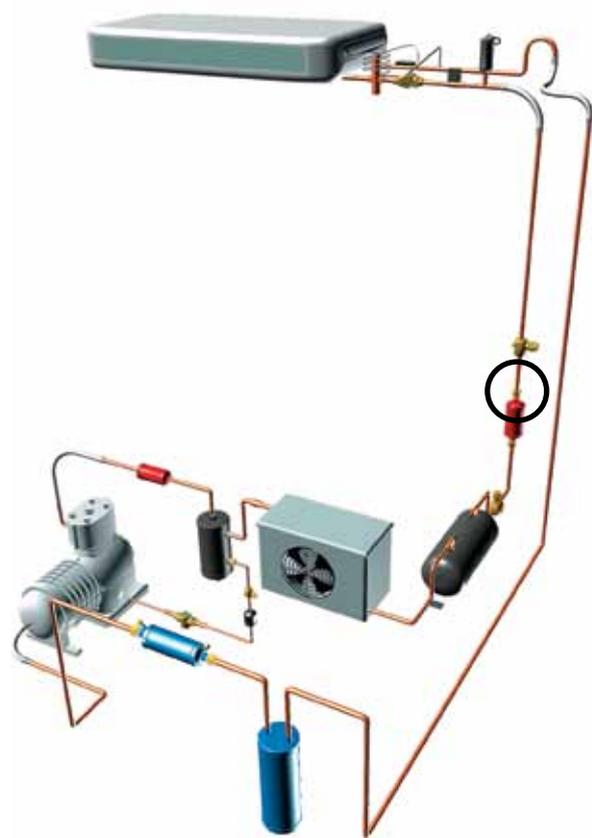
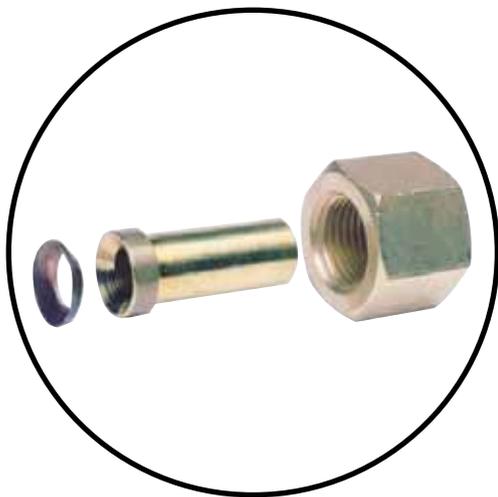


Connection sets

→ KRCY

■ Applications

- The connection sets can be used with all line components equipped with SAE connections to screw, in refrigerating and air conditioning installations.
- They ensure perfect air-tightness, even after several replacements of components, and facilitate maintenance conditions.



■ Functional features

- Products are compatible with HFCs, HCFCs, CFCs, CO₂ as well as with their associated oils and additives. Products are designed for use of non-hazardous refrigerants from group 2 of PED 97/23/EC. To use CARLY components with fluids of the hydrocarbon group 1 - Propane R290, Butane R600, Isobutane R600a, Propylene R1270 - with HFOs and transcritical CO₂ and for a RANKINE organic cycle application, contact CARLY technical department.
- Product classification in CE categories is performed using the PED 97/23/EC table, corresponding to a nominal diameter-based selection.
- The connection sets are composed of a brass dudgeon, a brass nut and a guided copper ring (except KRCY 6 S/MMS).
- The dudgeon is brazed on the piping on one side and the nut is screwed on a component on the other; the guided copper ring is positioned at the end of the dudgeon, in a specifically designed housing.
- For each model, connection sets are supplied in plastic bags containing 10 complete sets each. To avoid any risk of deterioration, 10 copper seals are packed in a reinforced cardboard box.

■ CARLY advantages

- Maximum working pressure 46 bar.
- Compared with a traditional mounting (dudgeon on copper piping), the connection sets:
 - ensure higher air tightness
 - increase the connection's reliability in time
 - allow numerous mountings and removals of components, at a lower cost and without work hardening or rupture of the piping dudgeon, which are major sources of refrigerant leaks.
- GOST certified products.



Connection sets

→ KRCY

■ Warning

Before selecting or installing any component, please refer to the chapter 0 - **WARNING**.

■ General assembly precautions

The installation of a component in a refrigeration system by a skilled professional, requires some precautions:

- Some are specific to each component, and in this case, they are specified in the

RECOMMENDATIONS SPECIFIC part defined hereafter ;

- Other are general to all CARLY components, they are presented in the chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

- The recommendations relating to the CARLY components for the subcritical CO₂ applications are also developed in chapter 115 – **GENERAL ASSEMBLY PRECAUTIONS**.

■ Recommendations specific to the connection sets KRCY

- When mounting the connection sets, it is imperative to ensure a good positioning of the copper gaskets in their housing, in order avoid them any abnormal deformation during tightening.
- The tightening of the connection sets on the components must imperatively be made with two open-end spanners, in order to avoid the twisting of the pipes, and the deterioration of their brass nut (tightening with pliers proscribed).
- It is imperative to respect the tightening torques listed in the table below.
- After each removal, imperatively replace the copper gaskets.

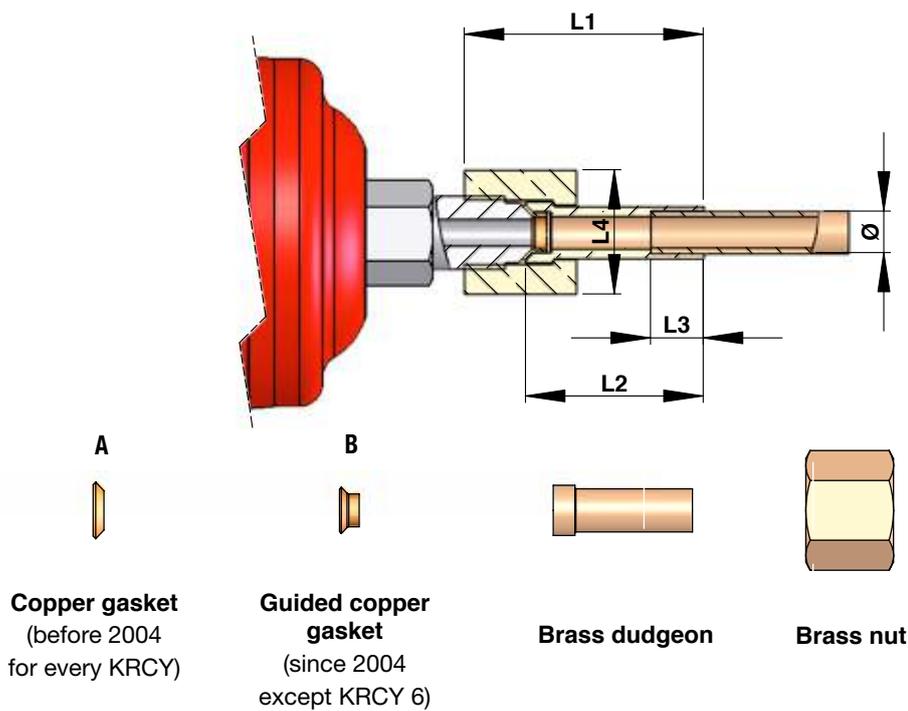


Connection sets

→ KRCY

■ Technical features

CARLY references	Connections To screw SAE inch	Connections To solder Ø ODF inch	CARLY references	Connections To screw SAE inch	Connections To solder Ø ODF mm	Gasket type	Dimensions mm				Maximum tightening torque N.m
							L1	L2	L3	L4 upper faces	
KRCY 2 S	1/4	1/4	KRCY 2 MMS	1/4	6	B	36	27	8	19	20
KRCY 3 S	3/8	3/8	KRCY 3 MMS	3/8	10	B	41	31	12	24	45
KRCY 4 S	1/2	1/2	KRCY 4 MMS	1/2	12	B	46	33	12	27	60
KRCY 5 S/MMS	5/8	5/8	KRCY 5 S/MMS	5/8	16	B	51	35	15	30	80
KRCY 6 S	3/4 BSP	3/4	KRCY 6 MMS	3/4 BSP	18	A	55	37	15	36	85
KRCY 23 S	3/8	1/4	KRCY 23 MMS	3/8	6	B	37	27	8	24	45
KRCY 34 S	1/2	3/8	KRCY 34 MMS	1/2	10	B	44	31	12	27	60



CARLY references	Nominal diameter	CARLY references	Nominal diameter	Maximal working pressure	Working pressure (1)	Maximal working temperature	Minimal working temperature	Working temperature (1)	CE Category (2)
	DN inch		DN mm						
KRCY 2 S	1/4	KRCY 2 MMS	6	46	15	120	-40	-30	Art3§3
KRCY 3 S	3/8	KRCY 3 MMS	10	46	15	120	-40	-30	Art3§3
KRCY 4 S	1/2	KRCY 4 MMS	12	46	15	120	-40	-30	Art3§3
KRCY 5 S/MMS	5/8	KRCY 5 S/MMS	16	46	15	120	-40	-30	Art3§3
KRCY 6 S	3/4	KRCY 6 MMS	18	46	15	120	-40	-30	Art3§3
KRCY 23 S	1/4	KRCY 23 MMS	6	46	15	120	-40	-30	Art3§3
KRCY 34 S	3/8	KRCY 34 MMS	10	46	15	120	-40	-30	Art3§3

(1) The working pressure is limited to the PS BT value when working temperature is lower than or equal to TS BT value.

(2) Classification by diameter, according to PED 97/23/EC (refer to chapter 0).

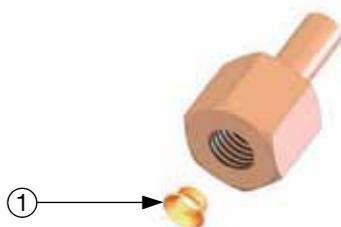


Connection sets

→ KRCY

■ Spare parts

CARLY references		Part Nb	Description	Quantity
Types	Spare parts			
2 S/MMS before 2004	CY 15590010	1	Set of 25 copper taper gaskets for 1/4" SAE connection	1
2 S/MMS after 2004	CY 15590015	1	Set of 25 guided taper copper gaskets for 1/4" SAE connection	1
3 S/MMS - 23 S/MMS before 2004	CY 15590020	1	Set of 25 copper taper gaskets for 3/8" SAE connection	1
3 S/MMS - 23 S/MMS after 2004	CY 15590025	1	Set of 25 guided taper copper gaskets for 3/8" SAE connection	1
4 S/MMS - 34 S/MMS before 2004	CY 15590030	1	Set of 25 copper taper gaskets for 1/2" SAE connection	1
4 S/MMS - 34 S/MMS after 2004	CY 15590035	1	Set of 25 guided taper copper gaskets for 1/2" SAE connection	1
5 S/MMS before 2004	CY 15590040	1	Set of 25 copper taper gaskets for 5/8" SAE connection	1
5 S/MMS after 2004	CY 15590045	1	Set of 25 guided taper copper gaskets for 5/8" SAE connection	1
6 S/MMS	CY 15590050	1	Set of 25 copper taper gaskets for 3/4" SAE connection	1



■ Weights and packaging

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
KRCY 2 S & MMS	0,041	0,040	10	KRCY 6 S & MMS	0,186	0,185	10
KRCY 3 S & MMS	0,066	0,065	10	KRCY 23 S & MMS	0,071	0,070	10
KRCY 4 S & MMS	0,091	0,090	10	KRCY 34 S & MMS	0,101	0,100	10
KRCY 5 S/MMS	0,116	0,115	10				

- 1 KRCY consists of 1 dudgeon, 1 nut and 1 taper copper gasket.
- The KRCY are sold in multiples of 10 pieces.



Introduction

➔ MAINTENANCE PRODUCT

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Refrigerant leak detectors

→ CARLYLOC



The French and European regulations on leak detection checks for refrigerating and air conditioning systems aim at:

- limiting the emissions of greenhouse effect refrigerants
- enhancing the protection of the ozone layer.

The check should be performed by a company duly registered: when starting-up, when intervening on the circuit, and at least once a year for installations in operation.



Flexible extension tube for aerosol

■ Applications

- **CARLYLOC** is a leak detector which works by bubble formation for effective and quick control of water- and air-tightness, assembly of welded and soldered refrigeration and air conditioning systems.
- The product is:
 - a synergetic formulation with a surface-active base (anionic and non-ionic);

- compatible with all refrigerants (CFCs, HCFCs, HFCs), natural gases (nitrogen, ammoniac...);
- non aggressive for metals, rubber and plastics;
- anti-freeze;
- non flammable, non toxic;
- fluorescent for quick localization of the leak.
- Intended for professional use.

■ Functional features

- **CARLYLOC** allows quick and easy detection of refrigerant leaks.
- Its wettability allows a homogenous distribution of the product on the surface.
- **CARLYLOC** comes in two formulations:
 - a liquid formulation: packaged in 0.4-litre aerosol;
 - a viscous formulation: packaged in a 0.5-litre spray with a 5-litre or 25-litre refill can.
- The product is efficient on surfaces, between - 20 °C and + 50 °C, whichever the size of the leaks.
- The product is compatible with all materials.
- Non-toxic to both humans and the environment

Aerosol:

- Level of VOC for the spray product (Volatil Organic Compounds): 2.04 %.
- Non-flammable propellant.
- Net volume: 400ml.

■ CARLY advantages

- Ready-for-use.
- Non aggressive for surfaces. Non toxic.
- CARLY offers **CARLYLOC** in the form of a 0.5-litre spray and of 5-litre or 25-litre refill can; this packaging mode presents numerous advantages:
 - **technical advantages:** the product is more viscous than in aerosol. It covers more efficiently the surfaces to be checked, bubble detection is easier, the product's yellow fluorescent coloration allows better visibility;
 - **environmental advantages:** the container is re-usable as opposed to the aerosol that should be disposed of after use;
 - **economical advantage:** 100 % of the contents can be used; refills in the form of 5-litre and 25-litre cans make the product extremely price-attractive.



Refrigerant leak detectors

→ CARLYLOC

■ Directions for use

- Shake before use.
- Apply **CARLYLOC** on the suspicious parts (connections, brazes, potential friction surfaces: piping close to each other, fastenings...) by spraying or coating.
- Formation of bubbles is immediate in case of leakage.
- The product is harmless; it can be removed by simple wiping or washing with a wet sponge.

■ Precautions for use

Precautions of use - see the Safety Data Sheet

- Causes skin irritation. Causes serious eye damage.
- Wear eye protection, protective gloves.
- IF ON SKIN: Wash with plenty of water.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Do not swallow.

Aerosol

- Pressurised container: May burst if heated.
- Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
- Pressurized container: Do not pierce or burn, even after use.
- Do not breathe dust/fume/gas/mist/vapours/spray.
- Use only outdoors or in a well-ventilated

area.

- IF SWALLOWED: Immediately call a POISON CENTER or doctor / physician.
- Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.

Storage conditions

- Keep the product at temperatures between + 5°C and + 40°C.

Waste treatment

- The products must be eliminated according to the legislation in force.

■ Technical features

CARLY references	Volume Litre	Packaging
CARLYLOC	0,40	Aerosol
CARLYLOC 500	0,50	Atomiser
CARLYLOC 5000	5,00	Can
CARLYLOC 25000	25,00	Can



Refrigerant leak detectors

→ CARLYLOC

■ Spare parts

CARLY references	Spare parts	Description
CARLYLOC	CY 10207090	Flexible extension tube for aerosol L = 60 cm
CARLYLOC 500	CY 44800200	Empty spray bottle, volume = 500 mL

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
CARLYLOC	0,52	12
CARLYLOC 500	0,57	15
CARLYLOC 5000	5,40	2
CARLYLOC 25000	26,00	1



Multi-surface cleaner: Cooling and refrigeration, air conditioning, kitchens...

→ CARLYCLEAN - CARLYCLEAN-F



Flexible extension tube for aerosol

Cooling and refrigeration, air conditioning :

Refrigerating and air conditioning systems' heat exchangers are environments that are subject to heat transfer. Any cleaning, grease, dust, corrosion and even bacterium and other micro-organisms act as isolation barriers and contribute to disturbing the exchangers' efficiency.

The air condenser installed outside is directly exposed to these undesirable soils.

In an air conditioning system, all particles (dust, greases, fumes) that are sufficiently small to go through the evaporator filter, accumulate on the fins which are generally wet and make up an ideal environment for bacteria and micro-organism development.

An efficient and harmless cleaning of exchangers is hence a priority in order to preserve their efficiency, increase their service life and maintain a healthy environment for the users.

Cold rooms, refrigerated warehouses and commercial kitchens...:

Cleaning surfaces in contact with food is permitted.

■ Applications

- **CARLYCLEAN** is a multi-surface concentrated alkaline degreasing agent, used in particular for the external cleaning of cooling systems and air conditioning systems (heat exchangers, fans, finned batteries), as well as cleaning surfaces in contact with food.
- Regular use of **CARLYCLEAN** optimises the thermal transfer of heat exchangers, maximises efficiency of the system, and

extends the life of the facility equipment, as well as increasing energy savings and gains with regard to maintenance costs.

- **CARLYCLEAN-F** is a multi-surface foam cleaner (for metal, plastic, etc.), packaged in aerosol casing.
- Intended for professional use, **CARLYCLEAN** and **CARLYCLEAN-F** eliminate fats, sticky residues, dust...

■ Functional features

- **CARLYCLEAN** associates the most detergent surface-active agent with the most emulsifying surface active agent. Thus its wetting and sequestering power makes it possible to easily reach, remove and eliminate the soils encountered.
- It is compatible with all materials used in the manufacture of heat exchangers (aluminium, copper, etc.) and protective compounds of fins (varnish, tin plating, etc.)
- **Economical**: The product is concentrated (packaged in sprayers and containers), and can be diluted.
- **Environmentally friendly**: Made from non-toxic compounds, it is readily biodegradable (> 90 %).
- Created in an eco-friendly way: Well-controlled energy levels, water consumption, and waste reprocessing.
- Rinsing is not required if the product is used in diluted form.

CARLYCLEAN-F, Aerosol:

- Compatible with all surfaces.
- Biodegradable: > 95 % (OCDE 301E)
- Level of VOC for the spray product (Volatil Organic Compounds): 9,50 %.
- Non-flammable propellant ; Net volume: 400 ml.

■ CARLY advantages

- Strong multi-surface degreasing capacity (aluminium, steel, etc.)
- Ready to use.
- Can be diluted (concentrated product): **CARLYCLEAN 500 / 5000 / 25000**.
- Also available as a foam: **CARLYCLEAN-F** (aerosol)
- Alkaline product, non-corrosive.
- Biodegradable: > 90%.
- Can be used for cleaning materials and articles intended for contact with food (Order dated 08/09/1999). Cleaned surfaces must be rinsed with water.
- Deodorising product.
- Available in four content forms: 500ml spray-can, 5 and 25 litre containers, 400 ml aerosol.
- Once the fins are perfectly cleaned-up, further antimicrobial treatment with **CARLYBIO** is recommended for the evaporators: **CARLYBIO** is efficient against bacteria (EN 1276), fungicides (EN 1650) and Legionella (NFT 72.301). Efficiency reports are available upon request.



Multi-surface cleaner: Cooling and refrigeration, air conditioning, kitchens...

→ CARLYCLEAN - CARLYCLEAN-F

■ Directions for use

CARLYCLEAN 500 / 5000 / 25000: Its concentration may vary widely: It can be used either in pure or diluted form (dilution up to 10%: 9 volumes of water for a volume of **CARLYCLEAN**).

- For heavily soiled surfaces (condensers): for maximum efficiency, it is recommended to perform a pulverisation on the soiled parts, to let the product act for at least 5 minutes, then to rinse with water. Repeat the treatment if necessary.
- For moderately to slightly soiled surfaces (evaporators): **CARLYCLEAN** can be diluted in 5 to 9 volumes of water. Rinsing is not mandatory (Defrosting is sufficient to rinse the fins).

CARLYCLEAN-F: Shake the can. Spray 20 cm away from the surfaces to be cleaned. Leave the treatment to work. Wipe off and repeat if necessary.

■ Legislation features

- The product complies with EC Regulation No. 648/2004 on cleaning agents: Compliance with the biodegradability criteria, containing less than 5 % phosphates and anionic surfactants.
- Contains Limonene: May produce an allergic reaction (**CARLYCLEAN 500/5000/25000**).
- In conformity with the Ministerial Order of 8 September 1999 on cleaning materials and articles intended to come into contact with foodstuffs.
- The judicious association of **CARLYCLEAN's** chemical components allows the elimination of soils by emulsion. This process is an efficient technique that only acts on the soils, without altering the fragile surfaces, such as aluminium fins or other nearby materials.
- Cleaning greasy deposits by emulsion is also healthier for the user and for the environment than some acid and caustic detergents, based on strong chemical interaction formations on the exchangers to degrease them or to remove the microbic flora.

■ Precautions for use

Precautions of use - see the Safety Data Sheet

- Do not spray onto energized electrical equipment.
- In case of contact with skin or eyes, rinse copiously with water.
- Do not swallow.
- Do not breathe vapour. Use only in well-ventilated areas.
- Aerosol: Pressure container.

Storage conditions

- Keep the product at temperatures between + 5°C and + 40°C.

Frequency of use

- In order to obtain an efficient heat exchange, it is recommended to clean-up the exchangers on a monthly basis.

Regulation

- For surfaces in contact with foodstuff, a rinse with drinkable water is required.

Waste treatment

- Do not dispose of this product and its packaging without taking the necessary precautions.

Application (**CARLYCLEAN 500/5000/25000**)

- To make the **CARLYCLEAN** use even easier, CARLY proposes a pump with a pressure of 5 L (refer to chapter 100).

■ Technical features

CARLY references	Volume Litre	Packaging
CARLYCLEAN 500	0,50	Atomiser
CARLYCLEAN 5000	5,00	Can
CARLYCLEAN 25000	25,00	Can
CARLYCLEAN-F	0,40	Aerosol



Multi-surface cleaner: Cooling and refrigeration, air conditioning, kitchens...

→ CARLYCLEAN - CARLYCLEAN-F

■ Spare parts

CARLY references	Spare parts	Description
CARLYCLEAN-F	CY 10207090	Flexible extension tube for aerosol L = 60 cm
CARLYCLEAN 500	CY 44800200	Empty spray bottle, volume = 500 mL

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
CARLYCLEAN 500	0,56	15
CARLYCLEAN 5000	5,25	2
CARLYCLEAN 25000	26,00	1
CARLYCLEAN-F	0,52	12



Refrigerating and air conditioning system decontaminants

→ CARLYBIO (Anti Legionella)



The air conditioning and refrigerating systems can be contaminated by micro-organisms (bacteria, mould, algae...).

The development of these micro-organisms is mainly caused by:

- warm water (20°C to 45°C);
- nutrients in sufficient amount (for instance, the iron salts produced by corrosion);
- the accumulation of organic materials, sediments and other micro-organisms.

A large part of these micro-organisms can be dispersed in the system by water coming from a condensation or de-icing system. Thus they can damage piping, heat exchangers and other surfaces by forming bio-films.

The Legionella Pneumophila bacterium is a micro-organism that can cause severe infections to man.

The water contaminated by the Legionella presents a risk for health when it is dispersed in the air and inhaled by man.

To fight against air conditioning and refrigerating system contamination, the installations must be regularly cleaned-up with **CARLYCLEAN**, then disinfected with **CARLYBIO**.

■ Applications

- **CARLYBIO** is intended for disinfection of cooling systems - air conditioning (such as fin evaporators, condensate tanks, filters), food environment surfaces (cold rooms, commercial kitchens), and aerodynamic networks (VMC...).
- Regular use of **CARLYBIO** helps fight against the growth of bacteria, mould and prevents the formation of unpleasant odours.
- Intended for professional use.

■ Functional features

• **CARLYBIO** has the following functions:

→ Bactericide

- EN1276 - EN13697 (*Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus*, *Enterococcus hirae*, 5-minute contact at 20°C).
- NFT72.301 (*Legionella Pneumophila*, 5-minute contact at 20°C).
- NFT72.150 - NFT72.170 (*Salmonelle*, *Listeria*, 10-minute contact at 20°C).

→ Fungicide

- EN1650 - EN13697 (*Candida Albicans*, *Aspergillus Niger*, 15-minute contact at 20°C).
- NFT72.200 (*Cladosporium*, *Absidia corymbifera*, 15-minute contact at 20°C).

CARLYBIO efficiency reports are available on request.

- The product is compatible with steel, paint, aluminium, copper and plastic surfaces (PE, PP, PVC, PTFE, PVDF...).
- **CARLYBIO** can be used in either pure or diluted form (20% maximum) on surfaces requiring disinfecting.

■ CARLY advantages

- **CARLYBIO** is a powerful bactericidal disinfectant and fungicide.
- Ready to use.
- Can be diluted.
- Neutral product, non aggressive for surfaces.
- Deodorising product.
- Available in 3 content forms: 500ml spray-can, 5 and 25 litre containers.



Refrigerating and air conditioning system decontaminants

→ CARLYBIO (Anti Legionella)

■ Functional features

- Clean the surfaces to be treated with **CARLYCLEAN**, then rinse with water.
- Spray **CARLYBIO** on the surfaces of elements to be treated: Evaporator fins, condensate tanks ...
- Leave the product to work between 5 and 20 minutes for perfect disinfection.
- For surfaces in contact with foodstuff, a rinse with drinkable water is required.

■ Legislation features

- **CARLYBIO** complies with European Regulation on biocides (98/8/EC) - TP2.
- Active substance: Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides (CAS 68424-85-1) - 1,8g / 100g.

■ Recommendations

Precautions of use - see the Safety Data Sheet

- Causes skin irritation. Causes serious eye irritation. Very toxic to aquatic life with long lasting effects.
- Wash hands and forearms thoroughly after handling.
- Avoid release to the environment.
- Wear eye protection, protective gloves.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

- If eye irritation persists: Get medical advice/attention.
- Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous waste.
- Do not swallow.
- Aerosol: Pressure container.

Storage conditions

- Keep the product at temperatures between + 5 °C and + 40 °C.

Frequency of use

- In order to obtain an efficient heat exchange, it is recommended to disinfect the exchangers on a monthly basis.

Waste treatment

- Empty packaging can be disposed of as non-hazardous waste, under the responsibility of the owner of the waste.
- Do not dispose of the product into drains and waterways.

Application (CARLYBIO 500/5000/ 25000)

- To make the **CARLYBIO** use even easier, CARLY proposes a pump with a pressure of 5 L (refer to chapter 100).

■ Technical features

CARLY references	Volume Litre	Packaging
CARLYBIO 500	0,50	Atomiser
CARLYBIO 5000	5,00	Can
CARLYBIO 25000	25,00	Can

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
CARLYBIO 500	0,50	15
CARLYBIO 5000	5,25	2
CARLYBIO 25000	26,00	1



Disinfectant, deodorant, perfume tangerine

→ CARLYCLIM



Flexible extension tube for aerosol



The air conditioning systems must be maintained and disinfected regularly in order to avoid:

- The development of bacteria and fungicides causing diseases such as Legionella, fungi, allergies
- The development of bad smells.

CARLYCLIM is a surface disinfectant and deodorant with tangerine fragrance, containing essential oils with immediate and lasting effect.

Air conditioning units

Automotive air conditioning



■ Applications

- Easy to use, the fast, effective and long-lasting action of **CARLYCLIM** allows you to treat: air-conditioning and heating systems, indoor units of A/C, ventilation ducts, fan coil units, air treatment terminal units and filters. It purifies also the ambient air. Suitable for disinfection of cars interior, buses...
- **CARLYCLIM** has a **fast power of disinfection** (15 min at 20°C) for bacteria and fungicides. Its residual effect prevents recontamination.
- **CARLYCLIM deodorizes effectively.** Unlike most of short terms

deodorant, which act as masking (a pleasant smell overlaps a foul smell), **CARLYCLIM** has been designed to transform and break the smelly molecules. Its action is all the more effective because the product is sprayed in micro droplets, allowing it to enter more easily into contact with molecules to destroy.

- **CARLYCLIM perfumes « sustainably »:** the fragrance persists several days.
- Intended for professional use.

■ Functional features

- **CARLYCLIM** has a function:
 - **Bactericide**
 - EN1040 (*Pseudomonas aeruginosa*, *Staphylococcus aureus* in 5 min. of contact at 20°C).
 - **Fungicide**
 - EN1275 (*Candida Albicans* in 15 min. of contact at 20°C)
 Efficiency reports are available upon request.
- The active ingredient of **CARLYCLIM** demonstrates a bactericidal activity on Legionella Pneumophila (NFT72-151), bacterium at the origin of the Legionnaire' disease in air conditioning systems.

■ CARLY advantages

- Disinfectant deodorant « triple action » : fast, efficient and durable.
- **CARLYCLIM** is formulated with essential oils known for their aromatherapy qualities and abilities to fight against odors (Destroys bad smells, does not mask them).
- **CARLYCLIM 150** is equipped with a One-Shot button: this allows either a classical intermittent diffusion, or, after percussion of the button, complete emptying in one go of the aerosol (ideal for cars a/c, central air treatment and aeraulic networks).
- The cardboard packaging of the **CARLYCLIM 150** serves as a POS for trade counter (contains 12 aerosols).
- Ready to use.
- Easy to use.
- Two different packaging possible: 150 ml aerosol (One-shot system) and 400 ml aerosol.



Disinfectant, deodorant, perfume tangerine

→ CARLYCLIM

■ Functional features

In order to treat A/C units :

- Put the unit in « OFF » position
- Take out the air inlet filter and clean it, or change it according to its state
- Shake the aerosol before use
- Spray **CARLYCLIM** on all the accessible area of the air exchanger, avoiding any spray into the eyes
- Let the product act during 15 minutes
- A small spray on the filter before putting it back will make the perfume in the local more lasting
- Put back the air inlet filter
- Put ON again the equipment, while keeping a good ventilation of the place.

In order to treat vehicle air conditioning systems, with **CARLYCLIM 150** :

- Start the engine with tick over, position the ventilation in “recycling” mode and put the temperature on “cold” with maximum speed
- Shake the aerosol, place it on the floor on the passenger side and push the spray-button
 - In discontinuous : spray slightly on the button
 - In continuous : lock the button and place the spray towards the back of the car, avoiding any spray into the eyes
- Close the glasses, and get off the car and close the doors
- Let the product act during 15 minutes and let aerate the vehicle.

■ Legislation features

- **CARLYCLIM** complies with European Regulation on biocides (98/8/EC) - TP2 - Disinfecting air product.
- Active substance: Contains (R)-p-mentha-1,8-diène, Citral. May cause an allergic reaction ; 5mg/l Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides (CAS n°68424-85-1) ; 3,3mg/l propan-2-ol (CAS 67-63-0).

■ Recommendations

Precautions of use - see the Safety Data Sheet

- Extremely flammable aerosol. Pressurised container: May burst if heated. May cause drowsiness or dizziness. Toxic to aquatic life with long lasting effects. May be fatal if swallowed and enters airways.
- Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
- Do not spray on an open flame or other ignition source.
- Pressurized container: Do not pierce or

burn, even after use.

- Avoid breathing mist/vapours/spray.
- Avoid release to the environment.
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.
- Do not swallow.

Storage conditions

- Keep the product at temperatures

between + 5 °C and + 40 °C.

Frequency of use

- In order to get an efficient thermal exchange, it is advised to make a monthly cleaning of the air-conditioning systems.

Waste treatment

- Empty packaging can be disposed of as non-hazardous waste, under the responsibility of the owner of the waste.
- Do not dispose of the product into drains and waterways.



Disinfectant, deodorant, perfume tangerine

→ CARLYCLIM

■ Technical features

CARLY references	Volume Litre	Packaging
CARLYCLIM 150	0,15	Aerosol
CARLYCLIM 400	0,40	Aerosol

■ Spare parts

CARLY references	Spare parts	Description
CARLYCLIM 400	CY 10207090	Flexible extension tube for aerosol L = 60 cm

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
CARLYCLIM 150	0,21	12
CARLYCLIM 400	0,50	12



Multi-surface cleaner and disinfectant: Cooling and refrigeration, air conditioning, kitchens...

→ CARLYPRO - CARLYPRO-F



Flexible extension tube
for aerosol

Cooling and refrigeration, air conditioning :

An efficient cleaning of heat exchanger is a priority for optimal efficiency of refrigerating and air conditioning installations, and helps extend equipment service life.

A periodic (permanent and preventive) disinfection makes it possible to prevent proliferation of micro-organisms (bacteria and mould) and formation of bad odours, while maintaining good air quality.

The association of detergent compounds and disinfectant compounds allows major savings of time, energy and labour, because only one product is used: **CARLYPRO**.

Cold rooms, refrigerated warehouses and commercial kitchens...:

Cleaning surfaces in indirect contact with food is permitted.

■ Applications

- **CARLYPRO** is a multi-surface alkaline disinfectant and degreasing agent intended for cooling and air conditioning systems (such as heat exchangers, condensate tanks and filters), food environment surfaces (cold rooms and commercial kitchens), and aerodynamic networks (CMV...).
- **CARLYPRO-F** is a multi surface disinfectant, bactericide and fungicide

foam for cooling and refrigeration systems, air conditioning, cold rooms, professional kitchens, CMV, clean areas...

- Intended to professional use, **CARLYPRO** and **CARLYPRO-F** eliminate fats, sticky residues and dust, helping to fight against the growth of bacteria and preventing the formation of unpleasant odours.

■ Functional features

- **CARLYPRO** has the following functions **bactericide**
 - EN1040 (*Pseudomonas aeruginosa*, *Staphylococcus aureus*, 5-minute contact at 20°C).
 - EN13697 (*Staphylococcus aureus*, *Escherichia coli*, *Enterococcus hirae*, 15-minute contact at 20°C).
 - EN1276 (*Légionella Pneumophila*, 15-minute contact at 20°C).
- And **fungicide**
 - EN1275 - EN13697 (*Candida Albicans*, *Aspergillus Niger*, 15-minute contact at 20°C).

CARLYPRO efficiency reports are available on request.

- The product is compatible with steel, paint, aluminium, copper and plastic surfaces (PE, PP, PVC, PTFE, PVDF...).
- **CARLYPRO** can be used in pure form on surfaces for scouring and disinfection.

CARLYPRO-F, Aerosol has a **bactericidal** effect

- EN1276 (*Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli*, *Enterococcus hirae*, 5-minute contact at 20°C).

et **fongicide**

- EN1275 (*Candida Albicans*, *Aspergillus Niger*, 15-minute contact at 20°C).
- Level of VOC for the spray product (Volatil Organic Compounds): 16,20 %.
- Non-flammable propellant ; Net volume: 400 ml.

■ CARLY advantages

- **CARLYPRO** is a powerful bactericide and fungicide detergent: it is thus unnecessary to use two different products (1 detergent + 1 disinfectant).
- Ready to use.
- Also available as a foam: **CARLYPRO-F** (aerosol)
- Product non aggressive for the surface (steel, aluminium, copper, plastics...)
- **CARLYPRO 500 / 5000 / 25000** is compliant with the legislation on the cleaning of foodstuff containers (order of 08/09/1999). For surfaces in contact with foodstuff, a rinse with drinkable water is required.
- Deodorising product.
- Available in four content forms: 500ml spray-can, 5 and 25 litre containers, 400ml aerosol.



Multi-surface cleaner and disinfectant: Cooling and refrigeration, air conditioning, kitchens...

→ CARLYPRO - CARLYPRO-F

■ Functional features

- Perform cleaning with **CARLYCLEAN** and rinse with water, if the surfaces to be treated contain too many soils.
- Spray **CARLYPRO** or **CARLYPRO-F** on the surfaces of the elements to be treated : Evaporator fins, condensate tanks...
- Leave the product to work between 5 and 20 minutes for perfect cleaning and disinfection.
- Wipe with a clean cloth and repeat the treatment if necessary.
- For surfaces in contact with foodstuff, a rinse with drinkable water is required.

■ Legislation features

- **CARLYPRO** and **CARLYPRO-F** comply with European Regulation on biocides (98/8/EC) - TP2.
- Active substance **CARLYPRO 500 / 5000 / 25000**: Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides (CAS 68424-85-1) - 2.4 g / 100 g.
- Active substance **CARLYPRO-F**: N-(3-aminopropyl)-N-dodecylpropane-1, 3-diamine (CAS n°2372-82-9): 0.45% w/w ; Didecyldimethylammonium chloride (CAS n°7173-51-5): 0.41% w/w.
- The product complies with EC Regulation No. 648/2004 on cleaning agents: Compliance with the biodegradability criteria, containing less than 5 % phosphates and anionic / nonionic surfactants.
- In conformity with the Ministerial Order of 8 September 1999 on cleaning materials and articles intended to come into contact with foodstuffs.

■ Recommendations

Precautions of use - see the Safety Data Sheet

- Do not spray onto energized electrical equipment.
- If swallowed, seek medical advice immediately and show this container or label.
- Do not swallow.
- Do not breathe vapour. Use only in well-ventilated areas.
- Aerosol: Pressure container.

Storage conditions

- Keep the product at temperatures between + 5°C and + 40°C.

Frequency of use

- In order to obtain an efficient heat exchange, it is recommended to disinfect the exchangers on a monthly basis.

Waste treatment

- Empty packaging can be disposed of as non-hazardous waste, under the

responsibility of the owner of the waste.

- Do not dispose of the product into drains and waterways.

Application (CARLYPRO 500/5000/ 25000)

- To make the **CARLYBIO** use even easier, CARLY proposes a pump with a pressure of 5 L (refer to chapter 100).

■ Technical features

CARLY references	Volume Litre	Packaging
CARLYPRO 500	0,50	Atomiser
CARLYPRO 5000	5,00	Can
CARLYPRO 25000	25,00	Can
CARLYPRO-F	0,40	Aerosol



Multi-surface cleaner and disinfectant: Cooling and refrigeration, air conditioning, kitchens...

→ CARLYPRO - CARLYPRO-F

■ Spare parts

CARLY references	Spare parts	Description
CARLYPRO-F	CY 10207090	Flexible extension tube for aerosol L = 60 cm
CARLYPRO 500	CY 44800200	Empty spray bottle, volume = 500 mL

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
CARLYPRO 500	0,56	15
CARLYPRO 5000	5,25	2
CARLYPRO 25000	26,00	1
CARLYPRO-F	0,51	12



Grease remover

→ CARLYNET



Flexible extension tube
for aerosol

CARLYNET is a solvent based condensing coil cleaner.

Its high degreasing performance mean that is particularly appropriate for very greasy surfaces (kitchens, restaurants, canteens etc.....)

CARLYNET contains **NEITHER Chlorides nor Fluorides**.

■ Applications

- **CARLYNET** is a degreasing solvent, ready to use, formulated for the cold cleaning of air condensers.
- This product, which dissolves easily, works rapidly and eliminates dust, oil, grease, impurities and all other residues and deposits.
- Intended for professional use, **CARLYNET** helps maintain clean heat exchangers to ensure better reliability and maximum efficiency of refrigeration equipment.

■ Functional features

- **CARLYNET** works against:
 - grease
 - oil
 - sticky residues
 - dust.
- Keeping the heat exchangers clean assures a better efficiency and a maximum yield from cooling equipment.
- Level of VOC (Volatil Organic Compounds): 93.5 %.
- Non-flammable propellant
- Net volume: 400ml.
- Recyclable steel casing.

■ CARLY advantages

- **CARLYNET** is a powerful degreasing solvent for condensers.
- It is without chlorides and fluorides.
- It dries quickly.
- It is non-aggressive for surfaces (steel, aluminium, copper, brass, plastic.....).
- No rinsing required after application of the product.
- Ready to use.
- Non-flammable propellant.
- Recyclable steel casing.



Grease remover

→ CARLYNET

■ Directions for use

- Before spraying ensure that the equipment to be treated is switched off and unplugged.
- Shake the product well. Spray approximately 15cm. from the surfaces to be cleaned, keeping the aerosol vertical.
- Leave until the solvent has completely evaporated.
- Wipe any surplus off with a clean cloth if necessary.
- Repeat if required.
- Use the extension tube for any localised treatment.

■ Precautions for use

Precautions of use - see the Safety Data Sheet

- Extremely flammable aerosol.
- Aerosol: Pressure container: may burst if heated.
- Causes skin irritation.
- May cause drowsiness or dizziness.
- Toxic to aquatic life with long lasting effects.
- Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
- Do not spray on an open flame or other

ignition source.

- Pressurized container: Do not pierce or burn, even after use.
- Do not breathe spray.
- IF ON SKIN: Wash with plenty of soap and water.
- Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.
- Dispose of contents/container to local/regional/national/international.
- Do not swallow.

Storage conditions

- Keep the product at temperatures between + 5°C and + 40°C.

Frequency of use

- In order to obtain an efficient heat exchange, it is recommended to clean-up the condensers on a monthly basis.

Waste treatment

- The products must be eliminated according to the legislation in force.
- Do not dispose of the product into drains and waterways.

■ Technical features

CARLY references	Volume Litre	Packaging
CARLYNET	0,40	Aerosol

■ Spare parts

CARLY references	Spare parts	Description
CARLYNET	CY 10207090	Flexible extension tube for aerosol L = 60 cm

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
CARLYNET	0,41	12



Anti-corrosion treatment for heat exchanger fins

→ CARLYCOAT



Heat exchangers coils used in air conditioning and refrigerating systems, are the seat of pollutants (mineral and vegetable dusts, humidity, acid rains, sulphurated or nitrogenous compounds).

These pollutants, major actors of atmospheric corrosion, are extremely harmful for the exchanger's surfaces (particularly aluminium fins).

The main metal materials, used in the heat exchanger's manufacturing (aluminium and cuprus alloys, galvanized steel), may corrode.

The corrosion under pollutants deposits, the most frequent, entails the complete deterioration of fins.

Changed into alumina (whitish product), the aluminium fins, for example, becomes breakable without any mechanical property.

To remedy the severe deterioration and extend the heat exchangers fins life, CARLY offers an anti-corrosion treatment - **CARLYCOAT**.

CHLORINE free product.

■ Applications

- **CARLYCOAT** is an anti-corrosion product, ready to use, formulated to fight against hostile surrounding agent.
- This product, with a high covering capacity and a high content of aluminium pigments, assures a maximal anti-oxidation and anti-corrosion protection of the aluminium and copper fins (for evaporators and condensers)
- The product does not pour. It has no side effects on the thermic exchange.
- **CARLYCOAT** is compatible with all materials used in the production of heat exchanger.
- Intended for professional use.

■ Functional features

- **CARLYCOAT** is especially intended for small heat exchanger fins.
- Chlorine free product.
- The product can be applied on surfaces where the temperature can vary between - 50°C and 550°C.
- A spray can treat 0,60 m² (400ml of active constituent).
- Non toxic. Irritating for the skin.
- Level of VOC (Volatil Organic Compounds): 87.25 %.
- Non-flammable propulsion gas.
- Net volume: 400 ml.
- Recyclable steel casing.

■ CARLY advantages

- **CARLYCOAT** ensures a high anti-corrosion and anti-oxidation protection of heat exchanger fins.
- Very high covering power.
- Homogeneous cover. Does not run, with high aluminium pigments content.
- Resists on surfaces where the temperature is between - 50°C and 550°C.
- Ready to use product.
- Fast drying (on clean and dry surfaces).
- For new heat exchangers or exchangers having already been used.
- Non-flammable propellant.
- Recyclable steel casing.



Anti-corrosion treatment for heat exchanger fins

→ CARLYCOAT

■ Directions for use

- Clean the fins surfaces to be treated with **CARLYCLEAN** (refer to chapter 82) and eliminate any oxidation tracks.
- Shake the product well.
- Spray at approximately 15 cm from the surfaces to be treated.
- Apply about 15 cm evenly to the surface of the fin, until the surface is completely covered.

■ Precautions for use

Precautions of use - see the Safety Data Sheet

- Extremely flammable aerosol. Pressurised container: May burst if heated.
- May be fatal if swallowed and enters airways.
- Causes skin irritation.
- Harmful to aquatic life with long lasting effects.
- Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- Do not spray on an open flame or other ignition source.
- Pressurized container: Do not pierce or burn, even after use.
- Avoid breathing mist/vapours/spray.
- Wear protective gloves/protective clothing/eye protection/face protection
- IF ON SKIN: Wash with plenty of soap and water.
- Protect from sunlight. Do no expose to temperatures exceeding 50°C/122°F.
- Dispose of contents/container in accordance with national regulations.
- Do not swallow.

Storage conditions

- Keep the product at temperatures between + 5°C and + 40°C.

Waste treatment

- The products must be eliminated according to the legislation in force.
- This material and its container must be disposed of as hazardous waste.
- Do not dispose of the product into drains and waterways.

■ Technical features

CARLY references	Volume Litre	Packaging
CARLYCOAT	0,40	Aerosol

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
CARLYCOAT	0,44	12



Lubricant - anti-seize

→ CARLYSTEEL



CARLYSTEEL is a product that ensures the following functions:

- Anti-seize
- Lubrication
- Protection against corrosion
- Protection against moisture
- Reduction of frictions
- Tar cleansing of mechanical parts.

It gets into blocked or corroded elements (bolts, screws, nuts, hinges...) in order to make their disassembling easier.



Flexible extension tube
for aerosol

■ Applications

- **ANTI-SEIZE:** CARLYSTEEL gets quickly and efficiently into oxidized or seized parts, in order to enable to unscrew the corroded parts, blocked or iced, and to ensure their disassembling.
- **LUBRICANT:** CARLYSTEEL ensures an excellent lubrication of mechanical parts and micro mechanisms, in order to ease the movements of parts between them and to avoid wear and overheating.
- **ANTI-CORROSION:** Protects the parts against oxidation and corrosion.
- **ANTI-MOISTURE:** Eliminates moisture on areas.
- **FRICTION REDUCTION:** Makes the sliding of moving parts easier and eliminate creaking.
- **TAR CLEANSING:** Dissolves greases and tars.

■ Functional features

- **CARLYSTEEL** has a very low superficial tension which guarantees a perfect penetration.
- Product without chlorine compound nor carcinogenic, mutagenic and toxic for reproduction substances (CMR).
- No dangerous compound for water environment.
- Flashpoint > 56 °C.
- Level of VOC (Volatil Organic Compounds): 97 %.
- Non-flammable propellant.
- Net volume: 97 % of usable active matter.

■ CARLY advantages

- **CARLYSTEEL** ensures the 6 following functions:
 - Anti-seize
 - Lubrication
 - Protection against corrosion
 - Protection against moisture
 - Reduction of frictions
 - Tar cleansing of mechanical parts.
- Non-flammable propellant: 97 % of usable active matter.
- Works in all positions, and the extension tube enables to reach points difficult to access.
- Non-flammable propellant.



Lubricant - anti-seize

→ CARLYSTEEL

■ Directions for use

- Shake before use.
- Spray at 20 cm of the parts to be treated.
- Wait a few moments, and repeat the operation for the parts hardly blocked.
- Works in all positions, and the extension tube enables to reach points difficult to access.

■ Precautions for use

Precautions of use - see the Safety Data Sheet

- Repeated exposure may cause skin dryness or cracking.
- Use only in well-ventilated areas.
- Extremely flammable product.
- Pressurised container.
- Protect from sun-light and do not expose to temperatures exceeding 50 °C.

- Do not pierce or burn after use.
- Do not spray on a naked flame or an incandescent material.
- Do not use for a different purpose from which it has been designed.
- Do not swallow.

Storage conditions

- Keep the product at temperatures between + 5°C and + 40°C.

Waste treatment

- The products must be eliminated according to the legislation in force.
- Do not dispose of the product into drains and waterways.

■ Technical features

CARLY references	Volume Litre	Packaging
CARLYSTEEL	0,40	Aerosol

■ Spare parts

CARLY references	Spare parts	Description
CARLYSTEEL	CY 10207090	Flexible extension tube for aerosol L = 60 cm

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
CARLYSTEEL	0,45	12



Acidity tests for refrigerant oils

→ TESTOIL-MAS / TESTOIL-POE / TESTOIL-MP



The oil acidity content is an important parameter to check because it determines the refrigerating installation's good operating condition.

Two internal chemical processes can alter the oil quality and generate the formation of acids and sludge harmful for the installation:

- the formation of free fluorinated and chlorinated acids produced by alteration of halogen refrigerants;
- the formation of fatty acids by hydrolysis of POE-type oils.

These acids then generate metallic salts and oxides (iron or copper) that could block the oil filter or lead to the copper plating of metallic parts in motion. These degradation phenomena are dangerous for the installation, because they lead to seizing of oil pumps and to severe damage due to lubrication defect.

The new oils (mineral, alkylbenzenes, polyvinylether and polyol-esters) have different acidity indices due to the addition of (anti-wear, antioxidant, anticorrosive...) additives by the manufacturer, in order to reduce mechanical wear and extend the compressor's service life.

■ Applications

- **TESTOILs** ensure monitoring of the additive mineral, alkylbenzene and polyol-ester oil acidity in refrigerating and air conditioning installations.
- Intended for professional use.

■ Functional features

- **TESTOILs** are solvent-based flammable chemical solutions, coming from natural products (they do not contain benzene, or xylene, or toluene).
- **TESTOIL-MAS** is compatible with no additive mineral, alkylbenzene and polyvinylether oils
- **TESTOIL-POE** is compatible with additive polyol-ester oils.
- Compounds of biodegradable substances.
- Non-toxic to humans and the environment.
- Level of VOC (Volatil Organic Compounds): 98 % - 16.9 grams / product.

■ CARLY advantages

- **TESTOILs** are ready for use products, usable on site.
- The measurement process is simple, quick and efficient.



Acidity tests for refrigerant oils

→ TESTOIL-MAS / TESTOIL-POE / TESTOIL-MP

■ Directions for use

- **TESTOIL** bottles should be opened only for immediate use.
- Pour an oil sample in the bottle.
- Shake and let it rest for 10 seconds until colour stabilisation.
- Observe the test solution colour:
 - Purple: test is satisfactory, oil acidity is correct;
 - Yellow: oil acidity is high, oil should be replaced.

■ Precautions for use

Precautions of use - see the Safety Data Sheet

- Highly flammable liquid and vapour.
- Causes serious eye irritation.
- May cause drowsiness or dizziness.
- Wear eye protection, protective gloves.
- Avoid breathing vapours.
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Keep container tightly closed.
- IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Store in a well-ventilated place. Keep cool.
- The test solution colour changes with highly additive oils (TAN > 0.30) but this does not mean that they are faulty: it is therefore very important to inquire about the additive contents of the oil used, for a correct interpretation of the result obtained when the acidity test is performed using **TESTOIL**.
- To ensure reliable measurement, shorten the handling time between the oil sampling from the compressor and the opening of the **TESTOIL** bottle.
- Do not swallow.
- The product is solvent-based and should be kept in a cool and dry place.
- Do not expose the product to sun-light.
- Do not use **TESTOIL** in a circuit containing a tracer (the tracer distorts the test's interpretation).

Storage conditions

- Keep the product at temperatures between + 5°C and + 30°C, in a dry and cool place, and protect from sunlight.

Waste treatment

- The products must be eliminated according to the legislation in force.
- Do not dispose of the product into drains and waterways.

■ Technical features

CARLY references	Acid test for additive oils	Packaging
TESTOIL-MAS	mineral, alkylbenzene and polyvinylether	1 bottle of 30 ml
TESTOIL-POE	polyol-ester	1 bottle of 30 ml
TESTOIL-MP	mineral, alkylbenzene, polyvinylether and polyol-ester	2 bottles of 30 ml

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
TESTOIL-MAS	0,07	18
TESTOIL-POE	0,07	18
TESTOIL-MP	0,14	16



Acid neutralisers for refrigerant oils

→ STOPACID-MAS / STOPACID-POE



The chemical development of acids and moisture inside of refrigerating and air conditioning installations can have important consequences on the operation of installations: compressor burnout, seizing of metallic parts, metal corrosion...

In order to protect the equipment from these undesirable chemical attacks, CARLY offers:

- an acid neutraliser for synthetic alkylbenzene and mineral oils - **STOPACID-MAS**
- and an acid neutraliser for polyol-ester oils - **STOPACID-POE**.

■ Applications

- **STOPACID-MAS** should be used in refrigerating and air conditioning systems lubricated by synthetic alkylbenzene and mineral oils.
- **STOPACID-POE** should be used in refrigerating and air conditioning systems lubricated by polyol-ester oils.
- These neutralization products are rigorously titrated and must always be used in full bottles in order to prevent moisture contamination.
- Intended for professional use.

■ Functional features

- A bottle of **STOPACID** treats 2 litres of oil and can reduce the oil acidity threshold by 0.1 mg of potash / g of oil.
- **STOPACID-MAS** is compatible with refrigerants: CFC, HCFC.
- **STOPACID-POE** is compatible with refrigerants: HFC.
- Non-toxic to humans.

■ CARLY advantages

- Products ready for use and simple of use.
- Products with high neutralization capacity of acids present in the synthetic alkylbenzene, mineral and polyol-ester oils.



Acid neutralisers for refrigerant oils

→ STOPACID-MAS / STOPACID-POE

■ Directions for use

- For mineral and alkylbenzene oils: Determine oil acidity with the **TESTOIL-MAS** acid test (refer to chapter 91). If the oil acidity is high (the solution turns yellow), the oil has to be treated with **STOPACID-MAS**.
- For polyol-ester oils : Determine oil acidity with the **TESTOIL-POE** acid test (refer to chapter 91). If the oil acidity is high (the solution turns yellow), the oil has to be treated with **STOPACID-POE**.
- Determine oil capacity of the installation by referring to the manufacturers' documentation or getting in touch with a registered distributor.
- Define the number of **STOPACID-MAS** bottles required for installation neutralization: the number of bottles to use = volume of oil in the compressor (in litre) / 2.
Note: an open bottle must be entirely poured into the installation; if the result of the above calculation indicates that 2.5 bottles are necessary, then you should use 3 bottles.
- An amount of oil equivalent to that of **STOPACID-MAS** must be collected before neutralization in order to maintain the compressor oil capacity.
- Shake the bottles and introduce their contents directly into the compressor sump, making sure that the system is stopped during product injection, and avoiding lengthy contact of the product with ambient air.
- After 7 days of operation, check the acidity content of the oil treated with **TESTOIL-MAS** or **TESTOIL-POE**.

■ Precautions for use

Precautions of use - see the Safety Data Sheet

- Store in a dry and cool place.
- Shake the bottles before use.
- Use the product by full bottles.

Storage conditions

- Keep the product at temperatures between + 5°C and + 40°C.

Waste treatment

- The products must be eliminated according to the legislation in force.
- Do not dispose of the product into drains and waterways.

■ Technical features

CARLY references	Acids neutraliser	Packaging
STOPACID-MAS	mineral and alkylbenzene	1 bottle of 30 ml
STOPACID-POE	polyol-ester	1 bottle of 30 ml

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
STOPACID-MAS	0,08	18
STOPACID-POE	0,08	18



Identification test for polyol-ester oils

→ DETECTOIL-POE

DETECTOIL-POE is an identification test for polyol-ester oils.

This simple and economical device allows, on site, the immediate identification of the type of oil used: mineral – alkylbenzene or polyester.

The user avoids all risk of mixing oils without first having to undertake long chemical laboratory analysis.



■ Applications

- **DETECTOIL-POE** is a ready to use test which permits the user to know in few seconds if the oil used in refrigerating and air conditioning units is a polyol-ester or not.
- Intended for professional use.

■ Functional features

- **DETECTOIL-POE** is a two phase solution, based on solvents and caustic products.
- The “test” solution forms a homogenous gel in the presence of a polyol-ester oil (the solution sets).
- The “test” solution remains liquid in the presence of a mineral or alkylbenzene oil.
- Level of VOC (Volatil Organic Compounds): 50 % - 9 grams / product.

■ CARLY advantages

- **DETECTOIL-POE** is ready for use product, usable on site.
- Reading the test is very simple, quick (only few seconds) and efficient.
- This product can be used instead of a long onerous analysis in a laboratory, or other measuring devices (refractometers).



Identification test for polyol-ester oils

→ DETECTOIL-POE

■ Directions for use

- The bottle of **DETECTOIL-POE** should be opened just before use.
- Pour a sample of the oil to be tested into the bottle, and then close it.
- Shake the "test" bottle for about fifteen seconds.
- Check the appearance of the solution
 - if a coloured gel has formed (the solution has set) : the tested oil is a polyol-ester one.
 - if the solution remains liquid : the oil in question is not a polyol-ester.

■ Recommendations

Precautions of use - see the Safety Data Sheet

- Highly flammable liquid and vapour.
- Causes severe skin burns and eye damage.
- May cause drowsiness or dizziness.
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Keep container tightly closed.
- Ground/bond container and receiving equipment.

- Do not breathe dust/fume/gas/mist/vapours/spray.
- Wash Hands and forearms thoroughly after handling.
- Wear protective gloves, eye protection, face protection.
- To ensure reliable measurement, shorten the handling time between the oil sampling from the compressor and the opening of the **DETECTOIL-POE** bottle.
- Do not swallow.
- The product is solvent-based and should

- be kept in a cool and dry place.
- Do not expose the product to sunlight.

Storage conditions

- Keep the product at temperatures between + 5°C and + 30°C, in a dry and cool place, and protect from sunlight.

Waste treatment

- The products must be eliminated according to the legislation in force.
- Do not dispose of the product into drains and waterways.

■ Technical features

CARLY references	Identification test for oils	Packaging
DETECTOIL-POE	polyol-ester	1 bottle of 30 ml

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
DETECTOIL-POE	0,07	18



Calories discharger

→ CARLYCOOL

For maximum protection of heat sensitive equipment during brazing or soldering operations.



■ Applications

- **CARLYCOOL** is a calories discharger: it is applied on zones that present a risk of degradation during temperature increases (nearby surfaces, walls, piping, line components, etc...) before the brazing or soldering operations.
- Thanks to its chemical composition, **CARLYCOOL** can eliminate most of the emitted calories and ensures an efficient protection against the noxious effects of excessive heat.
- Intended for professional use.

■ Functional features

- **CARLYCOOL** has a high calorie dissipating power.
- It does not run and can be used on sloped, vertical or horizontal parts.
- **CARLYCOOL** is stable at high temperatures.
- It is non toxic for materials, users and the environment.
- Vanilla odour.

■ CARLY advantages

- **CARLYCOOL** is a translucent gel that does not mask the work surfaces.
- Avoids having to remove the heat sensitive parts to be soldered.
- Non aggressive for the surfaces on which it is applied (steel, copper, aluminium...).
- Does not stain.
- After use, a simple wiping with a cloth leaves the surfaces clean, after brazing or soldering.



Calories discharger

→ CARLYCOOL

■ Directions for use

- Apply a 5 mm thickness of product on the part to be treated.
- Braze or solder, the product evaporates with the heat.
- If necessary, add more product to ensure maximum heat protection.
- After use, wipe with a clean cloth.

■ Precautions for use

- **CARLYCOOL** does not contain any hazardous products.
- Do not apply on electrical equipment, whether in operation or not.
- Do not swallow.

Storage conditions

- Keep the product at temperatures between + 5°C and + 40°C.

Waste treatment

- The product should be disposed of in accordance with the legislation in force.

■ Technical features

CARLY references	Volume Litre	Packaging
CARLYCOOL	0,60	Atomiser

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
CARLYCOOL	0,65	8



Accessories for maintenance products

→ POMPE 5000

For easier use of **CARLYCLEAN** detergent, of **CARLYBIO** decontaminant and of **CARLYPRO** detergent decontaminant.



■ Applications

- 5-L pressure spray for liquids (without solvent).

■ Functional features

- PE and PP bottle.
- Brass piston rod.
- Viton gaskets.
- Maximum pressure = 3 bar.
- Variable jet: vaporised or strong.
- Compatible with solvent-free liquids.
- Incompatible with derivative petroleum products, solvents, ...
- Presence of a safety valve.

■ Directions for use

- Pour the liquid into the pump by keeping enough space for air: this air, once compressed, will provide the correct pressure.
- Fit and firmly screw in the bottle pump piston.
- Actuate the pump bar in order to build up a sufficient pressure inside the pump.
- Adjust the jet (spray or strong jet) by means of the forward nozzle end, on the spray lance.



Accessories for maintenance products

→ POMPE 5000

■ Precautions for use

- After each use, discharge the pressure from the bottle by pulling out the safety valve relief bar.
- After use, rinse the pump and spray lance with clean water.
- Do not open the pump when pressurized.
- Avoid direct exposure of the pump to sunlight and protect the pump from freezing temperatures.
- Do not keep the pump next to hot temperature sources.
- Do not spray toxic or poisonous products or substances towards persons or animals.

■ Technical features

CARLY references	Volume Litre	Maximal working pressure bar
POMPE 5000	5	3

■ Weights and packaging

CARLY references	Unit weight kg	Packaging unit
POMPE 5000	2,02	1



Spare parts (classification by reference)

→ CY

CARLY references	Description	Types of products
CCY A 42	Adapter for end core holders	BDCY
CCY A 48	Adapter for end core holders	ACY / BCY
CCY A 100	Adapter for end core holders	BACY / BBCY
CY 10501000	Colour ball for sight glass	VCYR / TURBOIL-R® and TURBOIL-RF® HCYR / HCYN (B and BO types Bitzer)
CY 10810010	1/4" NPT phosphate plug for end plate	ACY / BCY / BACY / BBCY / HCYBF TURBOIL-F® 7011 S/MMS to 30025 S/MMS
CY 10850030	Plug for inspection rod	HCYVI
CY 10850110	Standard fastening plug	FILTRY
CY 10870010	Plug for inspection rod	HCYCTR
CY 11010750	Adapter for core holders	BCY-P14
CY 11610050	50 microns filtrating sleeve	FILTRY
CY 11610150	150 microns filtrating sleeve	FILTRY
CY 12850080	Sight glass 1" 1/4 ROTALOCK	LEVOIL 23 BO and 23 SC
CY 15552000	Four-lobed gasket for holed flange	HCYN / ELECTROIL / LEVOIL
CY 15552180	O-ring PTFE gasket for sight glass	FILTRY / VCYLS / VCYR 32 TURBOIL-R® and TURBOIL-RF® HCYR / HCYN B and BO (Bitzer) / ELECTROIL
CY 15552190	O-ring for holed flange	HCYN / HCYN 1A / ELECTROIL / LEVOIL 22, 23 and 33 RE
CY 15552360	End torique gasket	BCY-P14
CY 15553000	Gasket for 48 model core ends	CCY: HP / N / PLATINIUM
CY 15553100	Gasket for 100 model core ends	CCY: HP / N
CY 15555000	Bag of gaskets for shell end plates: CARLY and for most manufacturers of the market (gaskets: 122 x 114 x 1,6 and 114 x 103 x 1,6)	ACY / BCY / BCY-HP
CY 15555120	Gasket for top core holders	BDCY
CY 15555200	Adhesive gasket for core holders: C / D / B1	ACY / BCY
CY 15555211	End plate gasket	BDCY
CY 15555301	Gasket for flange of oil separators	HCYSD: 1503 / 2204 / 2505 / 3006 / 1504 S/MMS to 3009 S/MMS TURBOIL-RF® TURBOIL-F®: 2505 S/MMS to 3011 S/MMS
CY 15555303	Gasket for flange of oil separators	TURBOIL-F® 15013 S/MMS à 30025 S/MMS
CY 15555304	Gasket for flange of oil separators	TURBOIL-F® 7011 S/MMS à 9017 S/MMS
CY 15555601	Gasket for end plate and for flange of oil separator	ACY / BCY / HCYBF HCYSD: 3011 S/MMS - 3013 S/MMS - 15013 S/MMS to 70033 S/MMS
CY 15555620	Adhesive gasket for core holders: L - M2	BACY / BBCY
CY 15555701	Gasket for end plate and for oil separator	BACY / BBCY HCYSD: 6011 S/MMS to 8017 S/MMS
CY 15558700	Gasket for core holders: A1 / G1 / E / F	ACY / BCY
CY 15558800	Gasket for core holders: N1 / P1 / R1 / J2 / K2 / Q2	BACY / BBCY
CY 15580032	O-ring for connection-flange	HCYN : type BO (Bitzer)
CY 15580100	Gasket for 3/8" SAE Rotalock valve	TURBOIL-R® and TURBOIL-RF® HCYR / RLHCY / RLVCY CONDOR-V 100 to V 500 / CONDOR-H 150 and 250, outlet from 500, 750 and 1000
CY 15580120	Gasket for 5/8", 7/8" and 1" 1/8 Rotalock valve and connection	RLHCY / RLVCY / CONDOR-V 1000 to V 2500 / LEVOIL 23 BO and 23 SC
CY 15580140	Gasket for 1/2" ODF and 5/8" ODF Rotalock valve	HCYR / RLHCY / RLVCY / CONDOR-V 500 / V 1000 CONDOR-H inlet from 500, 750 and 1000
CY 15580160	Gasket for 5/8", 7/8" and 1" 1/8 Rotalock valve and connection	RLHCY / RLVCY : 400 to 700
CY 15590010	Set of 25 taper copper gaskets for 1/4" SAE connection	KRCY before 2004 HCYVI
CY 15590015	Set of 25 guided taper copper gaskets for 1/4" SAE connection	KRCY / VCYL / DCY MF
CY 15590020	Set of 25 taper copper gaskets for 3/8" SAE connection	KRCY before 2004 HCYVI / HCYVP / HCYCTR
CY 15590025	Set of 25 guided taper copper gaskets for 3/8" SAE connection	HCYCT / HCYVP / KRCY VCYL / DCY MF



Spare parts (classification by reference)

→ CY

CARLY references	Description	Types of products
CY 15590030	Set of 25 taper copper gaskets for 1/2" SAE connection	KRCY before 2004
CY 15590035	Set of 25 guided taper copper gaskets for 1/2" SAE connection	KRCY / VCYL
CY 15590040	Set of 25 taper copper gaskets for 5/8" SAE connection	KRCY before 2004 / VCYL
CY 15590045	Set of 25 guided taper copper gaskets for 5/8" SAE connection	KRCY
CY 15590050	Set of 25 taper copper gaskets for 3/4" SAE connection	KRCY
CY 17400000	1/4" ODF Rotalock connection with gasket	RLHCY / RLVCY : 09 to 20 / CONDOR-V 100 to V 500 CONDOR-H 150 and 250, outlet from 500, 750 and 1000
CY 17400010	3/8" ODF Rotalock connection with gasket	RLHCY / RLVCY : 25 to 45 / CONDOR-V 100 to V 500 CONDOR-H 150 and 250, outlet from 500, 750 and 1000
CY 17400020	1/2" ODF Rotalock connection with gasket	RLHCY / RLVCY : 60 to 90 / CONDOR-V 500 / V 1000 CONDOR-H inlet from 500, 750 and 1000
CY 17400035	5/8" ODF Rotalock connection with gasket	RLHCY / RLVCY : 120 to 300 / CONDOR-V 1000 to V 2500
CY 17400040	7/8" ODF Rotalock connection with gasket	RLHCY / RLVCY : 120 to 300 / CONDOR-V 1000 to V 2500
CY 17400050	1" 1/8 ODF Rotalock connection with gasket	RLHCY / RLVCY : 120 to 300 / CONDOR-V 1000 to V 2500
CY 17400055	7/8" ODF Rotalock connection with gasket	RLHCY / RLVCY : 400 to 700
CY 17400060	1" 1/8 ODF Rotalock connection with gasket	RLHCY / RLVCY : 400 to 700
CY 17400065	1" 3/8 ODF Rotalock connection with gasket	RLHCY / RLVCY : 400 to 700
CY 17637490	3/4 NPT adapter	LEVOIL 23 SC
CY 17637550	1" 1/8 - 18 UNEF adapter	LEVOIL 23 BO
CY 18906400	Roast exit	BDCY
CY 19700080	1/4" ODF Rotalock valve with gasket	RLHCY / RLVCY: 09 to 20 / CONDOR-V 100 to V 500 CONDOR-H 150 and 250, outlet from 500, 750 and 1000
CY 19700090	1/4" SAE Rotalock valve with gasket	RLHCY / RLVCY: 09 to 20 / CONDOR-V 100 to V 500 CONDOR-H 150 and 250, outlet from 500, 750 and 1000
CY 19700100	3/8" SAE Rotalock valve with gasket	TURBOIL-R® and TURBOIL-RF® HCVR: inlet and outlet from 40 to 150 inlet from 200 and from 300 RLHCY / RLVCY: 25 to 45 / CONDOR-V 100 to V 500 CONDOR-H 150 and 250, outlet from 500, 750 and 1000
CY 19700110	3/8" ODF Rotalock valve with gasket	RLHCY / RLVCY: 25 to 45 / CONDOR-V 100 to V 500 CONDOR-H 150 and 250, outlet from 500, 750 and 1000
CY 19700120	1/2" ODF Rotalock valve with gasket	HCVR: outlet from 200 / RLHCY / RLVCY: 60 to 90 / CONDOR-V 500 / V 1000 CONDOR-H inlet from 500, 750 and 1000
CY 19700130	5/8" ODF Rotalock valve with gasket	HCVR: outlet from 300 / CONDOR-V 100 to V 500
CY 19700135	5/8" ODF Rotalock valve with gasket	RLHCY / RLVCY: 120 to 300 / CONDOR-V 1000 to V 2500
CY 19700140	1/2" SAE Rotalock valve with gasket	RLHCY / RLVCY: 60 to 90 / CONDOR-V 500 / V 1000 CONDOR-H inlet from 500, 750 and 1000
CY 19700160	7/8" ODF Rotalock valve with gasket	RLHCY / RLVCY: 120 to 300 / CONDOR-V 1000 to V 2500
CY 19700170	1" 1/8 ODF Rotalock valve with gasket	RLHCY / RLVCY: 120 to 300 / CONDOR-V 1000 to V 2500
CY 19700175	7/8" ODF Rotalock valve with gasket	RLHCY / RLVCY: 400 to 700
CY 19700180	1" 1/8 ODF Rotalock valve with gasket	RLHCY / RLVCY: 400 to 700
CY 19700185	1" 3/8 ODF Rotalock valve with gasket	RLHCY / RLVCY: 400 to 700
CY 19900411	Set of 8 fastening screws for flange	HCYBF / ACY / BCY
CY 19900420	Set of 8 fastening screws for flange	HCYSD: 1503 to 3006, 1504 S/MMS to 3009 S/MMS TURBOIL-F® 15013 S/MMS to 30025 S/MMS
CY 19900425	Set of 8 fastening screws for flange	TURBOIL-F® and RF® 2505 S/MMS to 3011 S/MMS
CY 19900520	Set of 10 fastening screws for flange	BACY / BBCY / TURBOIL-F® 7011 S/MMS to 9017 S/MMS
CY 19900700	Set of 12 fastening screws for end plate	BCY-P14
CY 25012140	Glass	HCYN B and BO / ELECTROIL



Spare parts (classification by reference)

→ CY

CARLY references	Description	Types of products
CY 29900130	Bolts + intermediate disk + gaskets	LEVOIL
CY 33301000	Flange with gasket and 1/4" NPT plug	BDCY
CY 33301200	Flange with gasket and 1/4" NPT plug	ACY / BCY / HCYBF
CY 33301204	End plate + gasket + 1/4" NPT phosphate plug	BCY-P14
CY 33301700	Flange with gasket and 1/4" NPT plug	BACY / BBCY
CY 33303450	Flange with gasket and float set	HCYSD: 15013 S/MMS to 70033 S/MMS TURBOIL-F®: 15021 S/MMS à 30025 S/MMS
CY 33304000	Internal cores for oil separation and filtering	HCYSD: 15013 S/MMS to 15021 S/MMS
CY 33304100	Internal cores for oil separation and filtering	HCYSD: 30025 S/MMS to 70033 S/MMS
CY 33402000	Lower part of separator with gasket and float set	TURBOIL-F®: 2505 S/MMS to 3011 S/MMS (Before 2010)
CY 33403000	Lower part of separator with gasket and float set	TURBOIL-F®: 7011 S/MMS to 9017 S/MMS (Before 2010)
CY 33800456	Flange with gasket and float set	TURBOIL-F® 7011 S/MMS à 9017 S/MMS
CY 33800516	Flange with gasket and float set	TURBOIL-F®: 2505 S/MMS to 3011 S/MMS
CY 33801706	Flange with gasket and float set	TURBOIL-F® 15013 S/MMS à 15017 S/MMS
CY 35012140	Glass with moisture indicator	VCYLS / FILTRY / VCYR-W 32
CY 35012150	Glass without moisture indicator, gasket included	TURBOIL-R® / TURBOIL-RF® / HCYR / VCYLS / FILTRY / VCYR 32
CY 35012160	Glass with moisture indicator, gasket included	VCYR 50
CY 36002050	Double 3/4" gas nipple for SCROLL flange	HCYN 2 SC / ELECTROIL
CY 37001030	C core holder	ACY / BCY (2, 3 and 4 cores)
CY 37001040	D core holder	ACY (3 and 4 cores) / BCY (4 cores)
CY 37001050	E core holder	ACY (1 core)
CY 37001060	F core holder	ACY (2, 3 and 4 cores)
CY 37001070	A1 core holder	BCY (1 core)
CY 37001080	B1 core holder	BCY (3 and 4 cores)
CY 37001090	G1 core holder	BCY (2, 3 and 4 cores)
CY 37002010	H core holder	HCYBF (1, 2 and 3 cores)
CY 37002020	S core holder	HCYBF (2 and 3 cores)
CY 37003015	J2 core holder	BBCY (1 core)
CY 37003025	K2 core holder	BBCY (2, 3 and 4 cores)
CY 37003030	L core holder	BACY (2, 3 and 4 cores) / BBCY (2, 3 and 4 cores)
CY 37003040	M2 core holder	BACY (3 and 4 cores) / BBCY (3 and 4 cores)
CY 37003055	N1 core holder	BACY (1 core)
CY 37003065	P1 core holder	BACY (2 and 3 cores)
CY 37003075	Q2 core holder	BBCY (4 cores)
CY 37003085	R1 core holder	BACY (4 cores)
CY 37004000	Top core holder	BDCY
CY 37004010	Bottom core holder	BDCY
CY 37100200	Leg of fixing	CONDOR-V 100 to V 1400
CY 37100210	Leg of fixing	CONDOR-H 150 - H 250 - H 750
CY 37100220	Leg of fixing	CONDOR-H 500 - H 1000
CY 37100250	Feet	TURBOIL-F®: 2505 S/MMS to 3011 S/MMS (Before 2010)
CY 37100260	Feet (kit)	TURBOIL-F®: 2505 S/MMS to 9017 S/MMS (After 2010)
CY 37100300	Feet (kit)	TURBOIL-F®: 7011 S/MMS to 9017 S/MMS (Before 2010)
CY 38600220	Feet (kit)	TURBOIL-F®: 15013 S/MMS to 30025 S/MMS
HCYN 1V1	Oil level sight glass for standard flange (3-holes)	HCYN / LEVOIL
HCYN 1V1K	HCYN 1V1 + screws + gaskets	HCYN / LEVOIL



Correction factors for refrigerating capacities

→ LIQUID LINE ACCORDING TO STANDARD ARI 710-86

The refrigerating capacities values of CARLY filter drier selection tables for the liquid line (DCY - DDCY - NCY - RCY - BDCY - BCY - BBCY) have been established according to Standard ARI 710-86.

- i.e. with the following rate conditions⁽¹⁾:
 - $T_0 = -15\text{ °C}$
 - $T_k = 30\text{ °C}$
 - Flow rate corresponds to the pressure drop caused by the filter drier of 0.07 bar.
- For different rate conditions, a correction factor must be used that will depend on the refrigerant and on the evaporation and condensation temperatures.
In order to bring the installation's capacity (Q_{0x}) to this **STANDARD's** conditions, apply the following formula:

$$Q_{0x} \times \text{fct} = Q_{0\text{ARI}}$$

- This capacity correction allows rigorous selection of the filter drier to be installed on the refrigerating installation, by referring to the selection tables present in each product-related chapter.

■ Example

- Installation operating with R 404A under the following rate conditions:
 - $T_0 = -20\text{ °C}$
 - $T_k = 35\text{ °C}$
 - $Q_{0x} = 72\text{ kW}$
- How to convert the refrigerating installation's capacity to the conditions of Standard ARI 710-86?

- Read the correction factor page 112.3
 - $T_0 = -20\text{ °C}$
 - $T_k = 35\text{ °C}$
 - R 404A refrigerant
 → fct = 1.10

- Application of the correction formula

$$Q_{0x} \times \text{fct} = Q_{0\text{ARI}}$$

$$\rightarrow 72 \times 1.10 = 79.20\text{ kW}$$

The installation's capacity under the conditions of Standard ARI 710 - 86 is therefore 79.20 kW.

⁽¹⁾ Chapter «Abbreviations and units» (refer to chapter 113).



Correction factors for refrigerating capacities

→ LIQUID LINE ACCORDING TO STANDARD ARI 710-86

■ R22

Condensing temperature T_k °C	Evaporating temperature T_0 °C													
	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
60	1,20	1,21	1,22	1,24	1,25	1,27	1,29	1,31	1,34	1,36	1,39	1,41	1,44	1,47
55	1,14	1,15	1,16	1,18	1,19	1,21	1,23	1,24	1,26	1,29	1,31	1,33	1,36	1,39
50	1,09	1,10	1,11	1,12	1,14	1,15	1,17	1,18	1,20	1,22	1,24	1,27	1,29	1,31
45	1,04	1,05	1,06	1,07	1,09	1,10	1,12	1,13	1,15	1,17	1,18	1,21	1,23	1,25
40	1,00	1,01	1,02	1,03	1,04	1,06	1,07	1,08	1,10	1,12	1,13	1,15	1,17	1,19
35	0,97	0,97	0,98	0,99	1,00	1,01	1,03	1,04	1,05	1,07	1,08	1,10	1,12	1,14
30	0,93	0,94	0,95	0,96	0,97	0,98	0,99	1,00	1,01	1,03	1,04	1,06	1,07	1,09
25	0,90	0,91	0,91	0,92	0,93	0,94	0,95	0,96	0,98	0,99	1,00	1,02	1,03	1,05
20		0,88	0,88	0,89	0,90	0,91	0,92	0,93	0,94	0,95	0,97	0,98	0,99	1,01
15			0,86	0,86	0,87	0,88	0,89	0,90	0,91	0,92	0,93	0,94	0,96	0,97
10				0,84	0,84	0,85	0,86	0,87	0,88	0,89	0,90	0,91	0,92	0,94
5					0,82	0,83	0,83	0,84	0,85	0,86	0,87	0,88	0,89	0,91
0						0,80	0,81	0,82	0,83	0,83	0,84	0,85	0,87	0,88
-5							0,79	0,79	0,80	0,81	0,82	0,83	0,84	0,85
-10								0,77	0,78	0,79	0,80	0,80	0,81	0,82

■ R134a

Condensing temperature T_k °C	Evaporating temperature T_0 °C											
	20	15	10	5	0	-5	-10	-15	-20	-25	-30	
60	1,21	1,24	1,27	1,30	1,34	1,37	1,41	1,45	1,50	1,55	1,60	
55	1,14	1,16	1,19	1,21	1,24	1,28	1,31	1,35	1,38	1,42	1,47	
50	1,07	1,09	1,12	1,14	1,17	1,19	1,22	1,26	1,29	1,32	1,36	
45	1,02	1,03	1,06	1,08	1,10	1,12	1,15	1,18	1,21	1,24	1,27	
40	0,97	0,98	1,00	1,02	1,04	1,06	1,09	1,11	1,14	1,16	1,19	
35	0,92	0,94	0,95	0,97	0,99	1,01	1,03	1,05	1,08	1,10	1,13	
30	0,88	0,89	0,91	0,93	0,94	0,96	0,98	1,00	1,02	1,04	1,07	
25	0,84	0,86	0,87	0,89	0,90	0,92	0,94	0,95	0,97	0,99	1,01	
20		0,82	0,84	0,85	0,86	0,88	0,89	0,91	0,93	0,95	0,97	
15			0,80	0,82	0,83	0,84	0,86	0,87	0,89	0,91	0,92	
10				0,79	0,80	0,81	0,82	0,84	0,85	0,87	0,88	
5					0,77	0,78	0,79	0,81	0,82	0,83	0,85	
0						0,75	0,77	0,78	0,79	0,80	0,82	
-5							0,74	0,75	0,76	0,77	0,79	
-10								0,73	0,74	0,75	0,76	



Correction factors for refrigerating capacities

→ LIQUID LINE ACCORDING TO STANDARD ARI 710-86

■ R404A

Condensing temperature T_k °C	Evaporating temperature T_0 °C													
	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
60	1,47	1,51	1,56	1,61	1,67	1,73	1,80	1,88	1,98	2,08	2,20	2,33	2,48	2,66
55	1,30	1,33	1,37	1,41	1,45	1,50	1,55	1,61	1,68	1,75	1,83	1,93	2,03	2,15
50	1,17	1,20	1,23	1,26	1,29	1,33	1,37	1,42	1,47	1,53	1,59	1,66	1,73	1,82
45	1,07	1,09	1,12	1,14	1,17	1,20	1,24	1,28	1,32	1,36	1,41	1,47	1,52	1,59
40	0,99	1,01	1,03	1,05	1,08	1,10	1,13	1,16	1,20	1,24	1,28	1,32	1,37	1,42
35	0,93	0,94	0,96	0,98	1,00	1,02	1,05	1,07	1,10	1,14	1,17	1,21	1,25	1,29
30	0,87	0,88	0,90	0,92	0,94	0,96	0,98	1,00	1,03	1,05	1,08	1,11	1,15	1,18
25	0,82	0,83	0,85	0,86	0,88	0,90	0,92	0,94	0,96	0,98	1,01	1,04	1,06	1,10
20		0,79	0,80	0,82	0,83	0,85	0,86	0,88	0,90	0,92	0,95	0,97	0,99	1,02
15			0,76	0,78	0,79	0,80	0,82	0,84	0,85	0,87	0,89	0,91	0,94	0,96
10				0,74	0,75	0,77	0,78	0,79	0,81	0,83	0,84	0,86	0,88	0,90
5					0,72	0,73	0,74	0,76	0,77	0,79	0,80	0,82	0,84	0,86
0						0,70	0,71	0,72	0,74	0,75	0,76	0,78	0,80	0,81
-5							0,68	0,69	0,70	0,72	0,73	0,74	0,76	0,78
-10								0,67	0,68	0,69	0,70	0,71	0,73	0,74

■ R507

Condensing temperature T_k °C	Evaporating temperature T_0 °C													
	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
60	1,50	1,54	1,59	1,64	1,70	1,77	1,85	1,93	2,03	2,13	2,26	2,39	2,55	2,74
55	1,31	1,34	1,38	1,42	1,46	1,51	1,57	1,63	1,70	1,77	1,85	1,95	2,05	2,17
50	1,18	1,20	1,23	1,26	1,30	1,34	1,38	1,43	1,48	1,53	1,60	1,67	1,74	1,82
45	1,07	1,10	1,12	1,15	1,17	1,21	1,24	1,28	1,32	1,37	1,41	1,47	1,53	1,59
40	0,99	1,01	1,03	1,05	1,08	1,11	1,13	1,17	1,20	1,24	1,28	1,32	1,37	1,42
35	0,93	0,94	0,96	0,98	1,00	1,02	1,05	1,07	1,10	1,13	1,17	1,20	1,24	1,29
30	0,87	0,88	0,90	0,92	0,94	0,96	0,98	1,00	1,02	1,05	1,08	1,11	1,14	1,18
25	0,82	0,83	0,85	0,86	0,88	0,90	0,92	0,94	0,96	0,98	1,01	1,03	1,06	1,09
20		0,79	0,80	0,82	0,83	0,85	0,86	0,88	0,90	0,92	0,95	0,97	0,99	1,02
15			0,76	0,78	0,79	0,80	0,82	0,84	0,85	0,87	0,89	0,91	0,93	0,96
10				0,74	0,75	0,77	0,78	0,79	0,81	0,83	0,84	0,86	0,88	0,90
5					0,72	0,73	0,74	0,76	0,77	0,79	0,80	0,82	0,84	0,86
0						0,70	0,71	0,72	0,74	0,75	0,77	0,78	0,80	0,81
-5							0,68	0,69	0,71	0,72	0,73	0,75	0,76	0,78
-10								0,67	0,68	0,69	0,70	0,71	0,73	0,74



Correction factors for refrigerating capacities

→ LIQUID LINE ACCORDING TO STANDARD ARI 710-86

■ R407C

Condensing temperature T_k °C	Evaporating temperature T_0 °C											
	20	15	10	5	0	-5	-10	-15	-20	-25	-30	
60	1,28	1,30	1,32	1,34	1,37	1,40	1,44	1,47	1,51	1,55	1,60	
55	1,19	1,20	1,22	1,25	1,27	1,30	1,32	1,35	1,39	1,42	1,46	
50	1,11	1,13	1,15	1,16	1,19	1,21	1,23	1,26	1,29	1,32	1,35	
45	1,05	1,06	1,08	1,10	1,11	1,13	1,16	1,18	1,20	1,23	1,26	
40	1,00	1,01	1,02	1,04	1,05	1,07	1,09	1,11	1,13	1,16	1,18	
35	0,95	0,96	0,97	0,99	1,00	1,02	1,03	1,05	1,07	1,09	1,11	
30	0,91	0,92	0,93	0,94	0,95	0,97	0,98	1,00	1,02	1,04	1,06	
25	0,87	0,88	0,89	0,90	0,91	0,92	0,94	0,95	0,97	0,99	1,01	
20		0,84	0,85	0,86	0,87	0,89	0,90	0,91	0,93	0,94	0,96	
15			0,82	0,83	0,84	0,85	0,86	0,88	0,89	0,90	0,92	
10				0,80	0,81	0,82	0,83	0,84	0,85	0,87	0,88	
5					0,78	0,79	0,80	0,81	0,82	0,83	0,85	
0						0,76	0,77	0,78	0,79	0,80	0,82	
-5							0,75	0,76	0,77	0,78	0,79	
-10								0,73	0,74	0,75	0,76	

■ R410A

Condensing temperature T_k °C	Evaporating temperature T_0 °C													
	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
60	1,47	1,48	1,50	1,52	1,54	1,57	1,59	1,62	1,66	1,69	1,73	1,78	1,82	1,87
55	1,31	1,32	1,34	1,35	1,37	1,39	1,41	1,44	1,46	1,49	1,52	1,55	1,59	1,63
50	1,20	1,21	1,22	1,24	1,25	1,27	1,28	1,30	1,33	1,35	1,37	1,40	1,43	1,46
45	1,11	1,12	1,13	1,14	1,16	1,17	1,19	1,20	1,22	1,24	1,26	1,28	1,31	1,33
40	1,05	1,05	1,06	1,07	1,08	1,09	1,11	1,12	1,14	1,15	1,17	1,19	1,21	1,24
35	0,99	0,99	1,00	1,01	1,02	1,03	1,04	1,06	1,07	1,08	1,10	1,12	1,14	1,16
30	0,94	0,94	0,95	0,96	0,97	0,98	0,99	1,00	1,01	1,03	1,04	1,06	1,07	1,09
25	0,90	0,90	0,91	0,91	0,92	0,93	0,94	0,95	0,96	0,98	0,99	1,00	1,02	1,03
20		0,86	0,87	0,88	0,88	0,89	0,90	0,91	0,92	0,93	0,94	0,96	0,97	0,98
15			0,83	0,84	0,85	0,85	0,86	0,87	0,88	0,89	0,90	0,91	0,93	0,94
10				0,81	0,82	0,82	0,83	0,84	0,85	0,86	0,87	0,88	0,89	0,90
5					0,79	0,79	0,80	0,81	0,82	0,82	0,83	0,84	0,85	0,86
0						0,77	0,77	0,78	0,79	0,80	0,80	0,81	0,82	0,83
-5							0,75	0,75	0,76	0,77	0,78	0,78	0,79	0,80
-10								0,73	0,74	0,74	0,75	0,76	0,77	0,78



Correction factors for refrigerating capacities

➔ SUCTION LINE ACCORDING TO STANDARD ARI 730-2001

The refrigerating capacities values of CARLY filter selection tables for the suction line (NCY - FNCY - FACY - BDCY - ACY - BACY) have been established according to Standard ARI 730-2001.

- i.e. with the following rate conditions⁽¹⁾:
 - ➔ $T_0 = 4,4\text{ °C}$
 - ➔ $T_k = 32\text{ °C}$
 - ➔ Flow rate corresponding to the pressure drop caused by the filter of 0.21 bar.
- For different rate conditions, a correction factor must be used that will depend on the refrigerant and on the evaporation and condensation temperatures.
In order to bring the installation's capacity (Q_{0x}) to the **STANDARD** conditions, apply the following correction formula:

$$Q_{0x} \times \text{fct} = Q_{0\text{ARI}}$$

- This capacity correction allows rigorous selection of the filter to be installed on the refrigerating installation, by referring to the selection tables present in each product-related chapter.

■ Example

- Installation operating with R 507 under the following rate conditions:
 - ➔ $T_0 = -20\text{ °C}$
 - ➔ $T_k = 40\text{ °C}$
 - ➔ $Q_{0x} = 100\text{ kW}$
- How to convert the installation refrigerating capacity to the conditions of Standard ARI 730-2001?

- Lecture du facteur de correction page 112.7
 - ➔ $T_0 = -20\text{ °C}$
 - ➔ $T_k = 40\text{ °C}$
 - ➔ R 507 Refrigerant

$$\rightarrow \text{fct} = 1.27$$

- Application of the formula

$$Q_{0x} \times \text{fct} = Q_{0\text{ARI}}$$

$$\rightarrow 100 \times 1.27 = 127\text{ kW}$$

The installation capacity under the conditions of Standard ARI 730-2001 is therefore 127 kW.

⁽¹⁾ Chapter «Abbreviations and units» (refer to chapter 113).



Correction factors for refrigerating capacities

→ SUCTION LINE ACCORDING TO STANDARD ARI 730-2001

■ R22

Condensing temperature T_k °C	Evaporating temperature T_0 °C														
	20	15	10	5	4,4	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
60	1,23	1,24	1,26	1,27	1,28	1,29	1,31	1,33	1,35	1,37	1,40	1,43	1,46	1,49	1,52
55	1,17	1,18	1,20	1,21	1,21	1,23	1,24	1,26	1,28	1,30	1,32	1,35	1,37	1,40	1,43
50	1,12	1,13	1,14	1,16	1,16	1,17	1,19	1,20	1,22	1,24	1,26	1,28	1,30	1,33	1,35
45	1,07	1,08	1,10	1,11	1,11	1,12	1,13	1,15	1,16	1,18	1,20	1,22	1,24	1,26	1,29
40	1,03	1,04	1,05	1,06	1,06	1,07	1,09	1,10	1,12	1,13	1,15	1,17	1,19	1,21	1,23
35	0,99	1,00	1,01	1,02	1,02	1,03	1,04	1,06	1,07	1,09	1,10	1,12	1,13	1,15	1,17
32	0,97	0,98	0,99	1,00	1,00	1,01	1,02	1,03	1,05	1,06	1,07	1,09	1,11	1,12	1,14
30	0,96	0,97	0,97	0,98	0,99	0,99	1,01	1,02	1,03	1,04	1,06	1,07	1,09	1,11	1,12
25	0,93	0,93	0,94	0,95	0,95	0,96	0,97	0,98	0,99	1,00	1,02	1,03	1,05	1,06	1,08
20		0,90	0,91	0,92	0,92	0,93	0,94	0,95	0,96	0,97	0,98	0,99	1,01	1,02	1,04
15			0,88	0,89	0,89	0,90	0,91	0,91	0,93	0,94	0,95	0,96	0,97	0,99	1,00
10				0,86	0,86	0,87	0,88	0,89	0,90	0,91	0,92	0,93	0,94	0,95	0,97
5						0,84	0,85	0,86	0,87	0,88	0,89	0,90	0,91	0,92	0,93
0							0,82	0,83	0,84	0,85	0,86	0,87	0,88	0,89	0,90
-5								0,81	0,82	0,83	0,83	0,84	0,85	0,86	0,87
-10									0,79	0,80	0,81	0,82	0,83	0,84	0,85

■ R134a

Condensing temperature T_k °C	Evaporating temperature T_0 °C												
	20	15	10	5	4,4	0	-5	-10	-15	-20	-25	-30	
60	1,28	1,31	1,34	1,38	1,38	1,41	1,45	1,49	1,54	1,58	1,63	1,69	
55	1,20	1,23	1,26	1,29	1,28	1,32	1,35	1,38	1,42	1,46	1,51	1,55	
50	1,13	1,16	1,18	1,21	1,21	1,23	1,26	1,29	1,33	1,36	1,40	1,44	
45	1,07	1,09	1,12	1,14	1,14	1,16	1,19	1,22	1,25	1,28	1,31	1,34	
40	1,02	1,04	1,06	1,08	1,08	1,10	1,12	1,15	1,18	1,20	1,23	1,26	
35	0,97	0,99	1,01	1,03	1,03	1,05	1,07	1,09	1,11	1,14	1,16	1,19	
32	0,95	0,96	0,98	1,00	1,00	1,02	1,04	1,06	1,08	1,10	1,13	1,15	
30	0,93	0,95	0,96	0,98	0,98	1,00	1,02	1,04	1,06	1,08	1,10	1,13	
25	0,89	0,91	0,92	0,94	0,94	0,95	0,97	0,99	1,01	1,03	1,05	1,07	
20		0,87	0,88	0,90	0,90	0,91	0,93	0,95	0,96	0,98	1,00	1,02	
15			0,85	0,86	0,86	0,88	0,89	0,91	0,92	0,94	0,96	0,98	
10				0,83	0,83	0,84	0,86	0,87	0,89	0,90	0,92	0,94	
5						0,81	0,83	0,84	0,85	0,87	0,88	0,90	
0							0,80	0,81	0,82	0,84	0,85	0,86	
-5								0,78	0,79	0,81	0,82	0,83	
-10									0,77	0,78	0,79	0,80	



Correction factors for refrigerating capacities

→ SUCTION LINE ACCORDING TO STANDARD ARI 730-2001

■ R404A

Condensing temperature T_k °C	Evaporating temperature T_0 °C														
	20	15	10	5	4,4	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
60	1,56	1,60	1,65	1,71	1,71	1,77	1,84	1,91	2,00	2,10	2,21	2,33	2,47	2,63	2,82
55	1,38	1,41	1,45	1,49	1,50	1,54	1,59	1,65	1,71	1,78	1,86	1,95	2,04	2,15	2,28
50	1,24	1,27	1,30	1,33	1,34	1,37	1,41	1,46	1,51	1,56	1,62	1,69	1,76	1,84	1,93
45	1,14	1,16	1,19	1,21	1,22	1,24	1,28	1,31	1,35	1,40	1,45	1,50	1,56	1,62	1,69
40	1,05	1,07	1,09	1,12	1,12	1,14	1,17	1,20	1,24	1,27	1,31	1,35	1,40	1,45	1,51
35	0,98	1,00	1,02	1,04	1,04	1,06	1,09	1,11	1,14	1,17	1,20	1,24	1,28	1,32	1,37
32	0,95	0,96	0,98	1,00	1,00	1,02	1,04	1,06	1,09	1,12	1,15	1,18	1,22	1,26	1,30
30	0,92	0,94	0,95	0,97	0,97	0,99	1,01	1,04	1,06	1,09	1,12	1,15	1,18	1,22	1,25
25	0,87	0,89	0,90	0,92	0,92	0,93	0,95	0,97	0,99	1,02	1,04	1,07	1,10	1,13	1,16
20		0,84	0,85	0,87	0,87	0,88	0,90	0,92	0,94	0,96	0,98	1,00	1,03	1,06	1,08
15			0,81	0,82	0,83	0,84	0,85	0,87	0,89	0,90	0,92	0,95	0,97	0,99	1,02
10				0,79	0,79	0,80	0,81	0,83	0,84	0,86	0,88	0,90	0,92	0,94	0,96
5						0,76	0,77	0,79	0,80	0,82	0,83	0,85	0,87	0,89	0,91
0							0,74	0,75	0,77	0,78	0,80	0,81	0,83	0,84	0,86
-5								0,72	0,73	0,75	0,76	0,78	0,79	0,81	0,82
-10									0,71	0,72	0,73	0,74	0,76	0,77	0,79

■ R507

Condensing temperature T_k °C	Evaporating temperature T_0 °C														
	20	15	10	5	4,4	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
60	1,59	1,63	1,69	1,74	1,75	1,81	1,88	1,96	2,05	2,15	2,26	2,39	2,54	2,71	2,90
55	1,39	1,42	1,46	1,51	1,51	1,55	1,61	1,66	1,73	1,80	1,88	1,97	2,07	2,18	2,30
50	1,25	1,28	1,31	1,34	1,34	1,38	1,42	1,46	1,51	1,57	1,63	1,69	1,77	1,85	1,94
45	1,14	1,16	1,19	1,22	1,22	1,25	1,28	1,32	1,36	1,40	1,45	1,50	1,56	1,62	1,69
40	1,05	1,07	1,09	1,12	1,12	1,14	1,17	1,20	1,24	1,27	1,31	1,35	1,40	1,45	1,50
35	0,98	1,00	1,02	1,04	1,04	1,06	1,09	1,11	1,14	1,17	1,20	1,24	1,28	1,32	1,36
32	0,95	0,96	0,98	1,00	1,00	1,02	1,04	1,06	1,09	1,12	1,15	1,18	1,22	1,25	1,29
30	0,92	0,94	0,95	0,97	0,97	0,99	1,01	1,04	1,06	1,09	1,12	1,15	1,18	1,21	1,25
25	0,87	0,89	0,90	0,92	0,92	0,93	0,95	0,97	0,99	1,02	1,04	1,07	1,10	1,13	1,16
20		0,84	0,85	0,87	0,87	0,88	0,90	0,92	0,94	0,96	0,98	1,00	1,03	1,05	1,08
15			0,81	0,82	0,83	0,84	0,85	0,87	0,89	0,91	0,93	0,95	0,97	0,99	1,02
10				0,79	0,79	0,80	0,81	0,83	0,84	0,86	0,88	0,90	0,92	0,94	0,96
5						0,76	0,78	0,79	0,80	0,82	0,84	0,85	0,87	0,89	0,91
0							0,74	0,76	0,77	0,78	0,80	0,81	0,83	0,85	0,86
-5								0,72	0,74	0,75	0,76	0,78	0,79	0,81	0,82
-10									0,71	0,72	0,73	0,74	0,76	0,77	0,79



Correction factors for refrigerating capacities

→ SUCTION LINE ACCORDING TO STANDARD ARI 730-2001

■ R407C

Condensing temperature T_k °C	Evaporating temperature T_0 °C											
	20	15	10	5	4,4	0	-5	-10	-15	-20	-25	-30
60	1,33	1,35	1,38	1,40	1,41	1,43	1,46	1,50	1,53	1,57	1,62	1,67
55	1,24	1,26	1,28	1,30	1,30	1,32	1,35	1,38	1,41	1,45	1,48	1,52
50	1,16	1,18	1,19	1,21	1,22	1,24	1,26	1,29	1,31	1,34	1,37	1,41
45	1,09	1,11	1,13	1,14	1,15	1,16	1,18	1,21	1,23	1,25	1,28	1,31
40	1,04	1,05	1,07	1,08	1,08	1,10	1,12	1,14	1,16	1,18	1,21	1,23
35	0,99	1,00	1,01	1,03	1,03	1,04	1,06	1,08	1,10	1,12	1,14	1,16
32	0,96	0,97	0,98	1,00	1,00	1,01	1,03	1,05	1,06	1,08	1,10	1,13
30	0,94	0,95	0,97	0,98	0,98	0,99	1,01	1,03	1,04	1,06	1,08	1,10
25	0,90	0,91	0,93	0,94	0,94	0,95	0,96	0,98	0,99	1,01	1,03	1,05
20		0,88	0,89	0,90	0,90	0,91	0,92	0,94	0,95	0,97	0,98	1,00
15			0,85	0,86	0,87	0,88	0,89	0,90	0,91	0,93	0,94	0,96
10				0,83	0,83	0,84	0,85	0,86	0,88	0,89	0,90	0,92
5						0,81	0,82	0,83	0,84	0,86	0,87	0,88
0							0,79	0,80	0,81	0,83	0,84	0,85
-5								0,78	0,79	0,80	0,81	0,82
-10									0,76	0,77	0,78	0,79

■ R410A

Condensing temperature T_k °C	Evaporating temperature T_0 °C														
	20	15	10	5	4,4	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
60	1,50	1,51	1,53	1,55	1,55	1,57	1,60	1,63	1,66	1,69	1,73	1,77	1,81	1,86	1,91
55	1,34	1,35	1,37	1,38	1,38	1,40	1,42	1,44	1,47	1,49	1,52	1,55	1,59	1,62	1,66
50	1,23	1,24	1,25	1,26	1,26	1,28	1,29	1,31	1,33	1,35	1,38	1,40	1,43	1,46	1,49
45	1,14	1,15	1,16	1,17	1,17	1,18	1,19	1,21	1,23	1,25	1,27	1,29	1,31	1,34	1,36
40	1,07	1,07	1,08	1,09	1,09	1,10	1,12	1,13	1,15	1,16	1,18	1,20	1,22	1,24	1,26
35	1,01	1,01	1,02	1,03	1,03	1,04	1,05	1,06	1,08	1,09	1,11	1,12	1,14	1,16	1,18
32	0,98	0,98	0,99	1,00	1,00	1,01	1,02	1,03	1,04	1,06	1,07	1,09	1,10	1,12	1,14
30	0,96	0,96	0,97	0,98	0,98	0,99	1,00	1,01	1,02	1,03	1,05	1,06	1,08	1,09	1,11
25	0,91	0,92	0,93	0,93	0,93	0,94	0,95	0,96	0,97	0,98	1,00	1,01	1,02	1,04	1,05
20		0,88	0,89	0,89	0,89	0,90	0,91	0,92	0,93	0,94	0,95	0,96	0,98	0,99	1,00
15			0,85	0,86	0,86	0,87	0,87	0,88	0,89	0,90	0,91	0,92	0,93	0,95	0,96
10				0,83	0,83	0,83	0,84	0,85	0,86	0,86	0,87	0,88	0,90	0,91	0,92
5						0,80	0,81	0,82	0,82	0,83	0,84	0,85	0,86	0,87	0,88
0							0,78	0,79	0,80	0,80	0,81	0,82	0,83	0,84	0,85
-5								0,76	0,77	0,78	0,78	0,79	0,80	0,81	0,82
-10									0,75	0,75	0,76	0,77	0,77	0,78	0,79



Abbreviations and units

→ ABBREVIATIONS

ARI	Air conditioning and Refrigeration Institut.
BSP	British Standard Pipe, defines the cylindrical «gas» threading, «Whitworth» profile.
NPT	National Pipe Taper, defines the taper threading with which air-tightness is ensured metal on metal, and the link by NPT and NPTF taper threads.
ODF	Outside Diameter Female.
ODM	Outside Diameter Male.
SAE	Society of Automotive Engineers, deals with flare connections.
UNF	Unified pipe thread, defines the threading of a part in compliance with the international refrigerating industry Standard (STANDARD DIN 8904) and is equivalent to the SAE threading.
PTFE	Polytetrafluoroethylene.
T_o	Evaporation temperature.
T_k	Condensation temperature.
Q_o	Refrigerating capacity.
ΔP	Pressure drop or pressure differential.
F_{ct}	Correction factor.
Q_k	Condensation capacity.
ΔT₁	Condensation temperature - water inlet temperature.
TL₁	Water inlet temperature.

■ Refrigerants

HFC	Hydrofluorocarbon
HCFC	Hydrochlorofluorocarbon
CFC	Chlorofluorocarbon
HFO	Tetrafluoropropen
R1..., R2..., R3...	Pure refrigerants
R4... : 4	Zeotropic refrigerant (e.g. R404A: «A» defines the mixture)
R5... : 5	Azeotropic refrigerant (e.g. R507)
R6... : 6	Hydrocarbon (e.g. R600)
R7... : 7	Inorganic refrigerant (e.g. R717: 17 = molar mass of NH ₃ refrigerant)

■ Oils

Mineral oils: Paraffinic or naphtenic oils, used with CFCs, HCFCs, NH₃

Semi-synthetic oils: Mixture of mineral and synthetic oils, used with CFCs, HCFCs, NH₃

Synthetic oils:

AB	Alkylbenzenes, used with CFCs, HCFCs, NH ₃
PAO	Polyalphaolefines, used with CFCs, HCFCs, NH ₃
PAG	Polyalkyleneglycols, used with R134a and NH ₃
POE	Polyolesters, used with HFCs
PVE	Polyvinylether, used with HFCs
TAN	Total Acid Number (mg of potash/g of oil)



Abbreviations and units

→ UNITS

■ Lengths

Units A	Units SI	Adjustment factor F_{ct}
Inch (in.)	m	0.254
Foot (ft)	m	0.3048
Yard (yd)	m	0.9144

$$Unit_{SI} = Unit_A \times F_{ct}$$

$$Unit_A = Unit_{SI} / F_{ct}$$

■ Volumes

Units A	Units SI	Adjustment factor F_{ct}
Cubic inch (cu.in)	m ³	16.387.10 ⁻⁶
Cubic foot (cu.ft)	m ³	0.02832
US-Gallon	m ³	0.003785
Imperial-Gallon	m ³	0.004546

$$Unit_{SI} = Unit_A \times F_{ct}$$

$$Unit_A = Unit_{SI} / F_{ct}$$

■ Masses

Units A	Units SI	Adjustment factor F_{ct}
lb (pound)	kg	0.4536
short ton	kg	907.2
long ton	kg	1016

$$Unit_{SI} = Unit_A \times F_{ct}$$

$$Unit_A = Unit_{SI} / F_{ct}$$

■ Mass concentration

ppm Part per million in mass, i.e. 1 milligram of water per kilogram of refrigerant.



Abbreviations and units

→ UNITS

■ Pressures

Units A	Units SI	Adjustment factor F_{ct}
bar	Pa	100 000
kg/cm ²	Pa	98 070
lb/sq.ft	Pa	47.9
lb/sq.in	Pa	6 895
atm	Pa	101 325
Torr	Pa	133.33
hPa	Pa	100
Mpa	Pa	1 000 000

$$Unit_{SI} = Unit_A \times F_{ct}$$

$$Unit_A = Unit_{SI} / F_{ct}$$

- The pressures announced in the technical documentation are expressed in relative values with the atmospheric pressure as reference value.
- Example:
A maximum working pressure of 42 bar is that read on a manometer whose 0 graduation corresponds to the atmospheric pressure.

■ Temperatures

SI Units:	Kelvin (K) or degree Celsius (°C) 0 °C = 273 K
Fahrenheit Degree (°F)	0 °C = 32 °F Conversion of °C in °F: $t_{oF} = 9/5 t_{oC} + 32$ Conversion of °F in °C: $t_{oC} = 5/9 (t_{oF} - 32)$



Abbreviations and units

→ UNITS

■ Energetics

Units A	Units SI	Adjustment factor F_{ct}
kcal/h	W	1.163
Btu/p.hr	W	0.293
Br.u.r (British theoretical unit of refrigeration)	W	5615
Br.ton (British commercial ton of refrigeration)	W	3888
ton (Standard commercial ton of refrigeration)	W	3513
PS (cheval vapeur)	W	735.5
h.p (horse power)	W	745.7
m.kg/s	W	9.804

$$Unit_{SI} = Unit_A \times F_{ct}$$

$$Unit_A = Unit_{SI} / F_{ct}$$

■ Flow rates

Kv coefficient of a valve

$$Kv = \frac{Qv}{\sqrt{\Delta P}}$$

with

Qv: Liquid volume flow rate (m³/hr)

ΔP: Pressure drop (bar)

Kv represents the volume flow rate of water running through the device for a pressure drop of 1 bar.

■ Electrical power

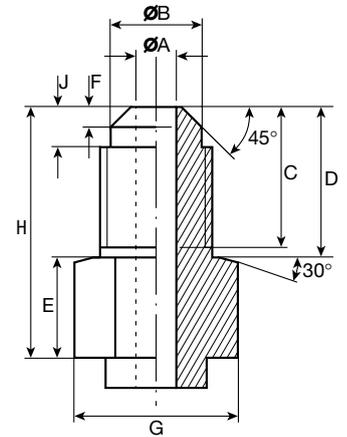
VA	Volt Ampere
V	Volt
Ac	Alternating current
Hz	Hertz
A	Ampere
W	Watt



Drawings and connection features

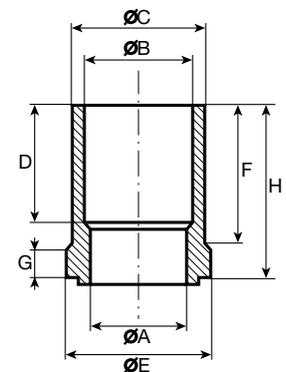
→ TYPE 1 CONNECTIONS

Connections to screw inch	Number of threads inch	Dimensions mm								
		ØA	ØB	C	D	E	F	G	H	J
1/4 SAE	7/16 - 20	4	9	13	15	10	2,0	14	25	4
3/8 SAE	5/8 - 18	7	13	17	18	10	2,5	17	28	5
1/2 SAE	3/4 - 16	10	16	19	20	10	2,5	22	30	5
5/8 SAE	7/8 - 14	13	18	22	23	9	2,3	24	32	5
3/4 BSP	1 1/6 - 14	17	23	24	25	11	2,5	30	36	5



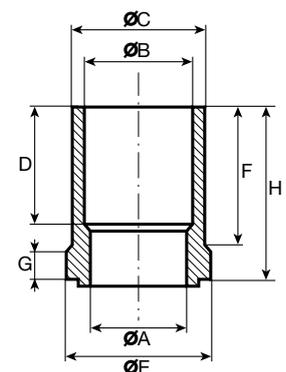
→ TYPE 2 CONNECTIONS (in inches)

Connections to solder ODF inch	Dimensions mm							
	ØA	ØB	ØC	D	E	F	G	H
1/4	4,3	6,40	9,40	6	14	12	5	20
3/8	8,0	9,60	12,60	9	14	12	6	20
1/2	10,0	12,80	15,80	10	22	13	5	20
5/8	14,0	16,10	18,95	16	22	13	7	22
3/4	17,0	19,15	22,10	17	27	15	8	25
7/8	20,0	22,30	25,30	19	34	21	7	32
1	24,0	25,50	28,50	24	34	26	8	37



→ TYPE 2 CONNECTIONS (in mm)

Connections to solder ODF mm	Dimensions mm							
	ØA	ØB	ØC	D	E	F	G	H
6	4,3	6,1	9,40	6	14	12	5	20
10	8,0	10,1	12,60	9	14	12	6	20
12	10,0	12,1	15,80	10	22	13	5	20
16	14,0	16,1	18,95	16	22	13	7	22
18	17,0	18,1	22,10	17	27	15	8	25
22	20,0	22,1	25,30	19	34	21	7	32

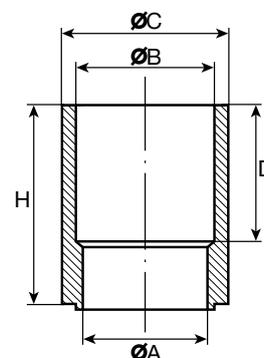




Drawings and connection features

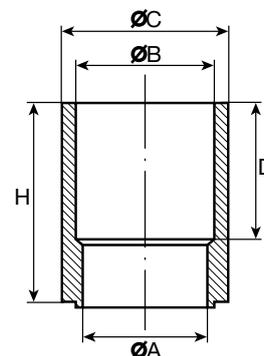
→ TYPE 3 CONNECTIONS *(in inches)*

Connections to solder ODF inch	Dimensions mm				
	ØA	ØB	ØC	D	H
1 1/8	26,0	28,7	34,0	24	37
1 3/8	32,0	35,0	40,0	30	47
1 5/8	38,0	41,4	45,0	30	47
2 1/8	52,3	54,1	60,3	35	62
2 5/8	66,1	66,8	76,1	38	74
3 1/8	76,3	79,5	88,8	45	85
3 5/8	89,0	92,2	101,6	55	92
4 1/8	101,7	104,9	114,3	55	100
5 1/8	127,1	130,3	139,7	55	100



→ TYPE 3 CONNECTIONS *(in mm)*

Connections to solder ODF mm	Dimensions mm				
	ØA	ØB	ØC	D	H
28	26,0	28,1	34,0	24	37
35	32,0	35,1	40,0	30	47
42	38,4	42,1	48,3	30	47
54	52,0	54,1	60,3	35	62
67	66,0	67,1	76,1	38	74
80	79,0	80,1	88,8	45	85
88.9	90,0	89,0	101,6	55	92
108	102,0	108,1	114,3	55	100
130	127,1	130,1	139,7	55	100

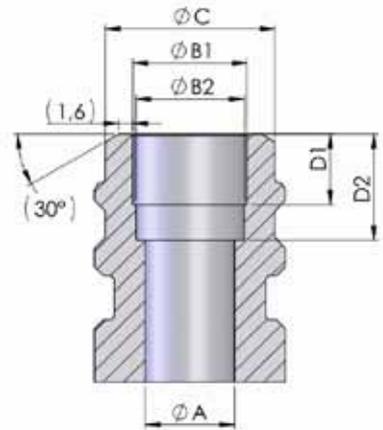




Drawings and connection features

→ TYPE 4 CONNECTIONS *(in inches and in mm)*

Connections to solder ODF		Dimensions mm					
		ØA	ØB1	ØB2	ØC	D1	D2
1/4	6	5,5	6,4	6,1	11,0	6	10
3/8	10	8,0	10,1	9,6	14,2	6	10
1/2	12	10,0	12,8	12,1	19,0	8	12



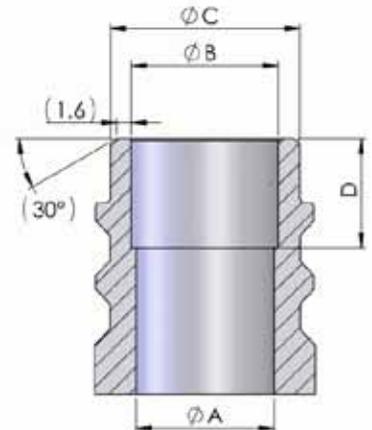
Preparation of the connection ends for:

- Butt-welding according EN 10253
- Brazing according EN 1254

Carbon steel connections - Group 1 or 11 according EN 15608

→ TYPE 5 CONNECTIONS *(in inches and in mm)*

Connections to solder ODF		Dimensions mm			
		ØA	ØB	ØC	D
5/8	16	15,0	16,1	20,6	12
3/4	-	17,0	19,2	28,0	16
7/8	22	20,0	22,3	28,0	18
1 3/8	35	32,4	35,1	44,0	30



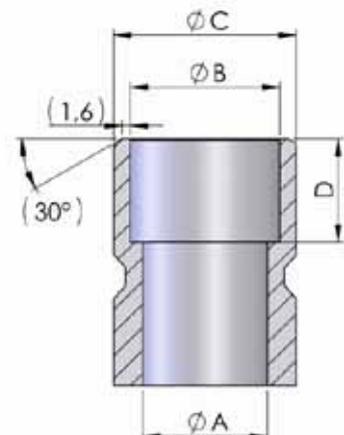
Preparation of the connection ends for:

- Butt-welding according EN 10253
- Brazing according EN 1254

Carbon steel connections - Group 1 or 11 according EN 15608

→ TYPE 6 CONNECTIONS *(in inches and in mm)*

Connections to solder ODF		Dimensions mm			
		ØA	ØB	ØC	D
1 1/8	28	24,0	28,7	35,0	20
		24,0	28,1	35,0	20
1 5/8	42	32,0	41,4	47,9	30
		32,0	42,1	47,9	30



Preparation of the connection ends for:

- Butt-welding according EN 10253
- Brazing according EN 1254

Carbon steel connections - Group 1 or 11 according EN 15608



General assembly precautions

→ USE OF CARLY COMPONENTS

- CARLY components are designed for use with CFCs, HCFCs, HFCs and CO₂ as well as with their associated oils and additives; these are non hazardous refrigerants from group 2 of the Pressure Equipment Directive 97/23/EC. For the use of CARLY components with refrigerants of group I, type hydrocarbons – Propane R290, Butane R600, Isobutane R600a, Propylene R1270, please contact CARLY technical service.
- The label on the products with the CE marking, must remain visible and must not be covered nor damaged.
- Refrigerants used are particularly expansible depending on the temperatures they bear. Consequently, they can produce very important pressure variations, which are function of these temperatures and the areas on which these pressures apply. In consideration of the law of mechanics and fluid thermodynamics, and in order to avoid any phenomenon linked to hydrostatic forces, some precautions are mandatory; for instance, one must ensure that none part of the circuit, and especially none component at any time might be full of liquid without the protection of a device such as a safety valve in order to protect from an overpressure that would exceed the maximum working pressure admissible in this part of the installation. This recommendation especially applies to installations using the technology of sub cooling of the refrigerant. Not respecting this rule may have serious material and corporal consequences.
- Pressure equipments present some danger. During their handling, it is mandatory to take the necessary safety measures and to wear the individual protections according to the regulation in force.
- Only a skilled personal (EN 13313) trained and initiated to interventions on refrigeration installations and pressure equipment, and with the qualifications required by the regulation of the country of use, is authorized to install CARLY components.
- Respect admissible pressures and temperatures, indicated on the label or marked on the products.
- Take all the necessary measures in order to avoid liquid hammer phenomenon, especially at the starting-up of the installation.
- It is important to check regularly the pressure drop due to components, and to replace them as soon as they produce a level of pressure drop that could trouble the right working of the installation.

→ COMPONENT INSTALLATION

- Check that the component and its packaging actually bear the references corresponding to the model selected.
- A close attention must be paid to the preparation and the realization of the assembling, that is to say:
 - Ensure that the tubes are cut in right angle, and that the ends have a perfectly circular shape, without oval ;
 - Eliminate burrs and unevenness due to pipe cut; to be made rather by a pipe cutter than with a saw ;
 - Pipe bending has to be made in a way that avoids modifying the shape of the ends.
- The components and the piping used must be totally clean, dry and sealed at ends, before their use; to that purpose, check that the components' blanking plugs are always properly in place and remove them at the last moment only, just before installing them on the circuit.
- The pipe network of the installation must be as short and compact as possible and must not create oil traps in the lower parts of the network ; suction pipes have to be designed taking into account the oil return to the compressor.
- In order to prevent internal condensation phenomena, the components must be at a temperature higher or equal to the ambient temperature, before being installed.
- Most components have a precise way of mounting that has to be respected, taking into account the direction of the refrigerant flow inside indicated by the word "IN" marked on the inlet end of the component or an arrow printed on the label.
- Ensure that the component is installed at the right place of the installation and mounted in the right direction (horizontal or vertical).
- Components must not support any additional stresses from the pipes or the supports of any type.

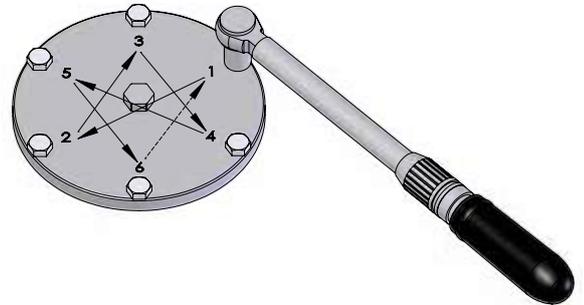


General assembly precautions

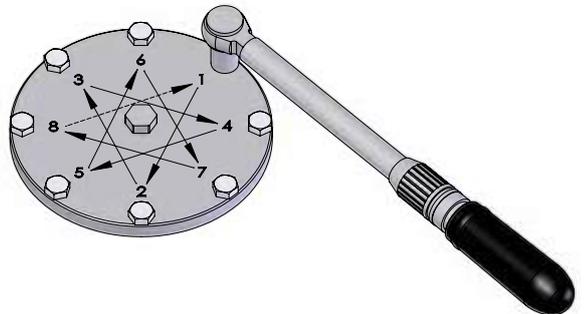
→ COMPONENT INSTALLATION

- When installing components with replaceable elements, or accessible for cleaning, such as: BDCY, BCY, BCT-HP, ACY, BBCY, BACY, HCYBF, TURBOIL-F, provide necessary space for their assembly and disassembly. This dimension is specified in the technical characteristics table of the component.
- **Procedure of tightening crossways for flanges of demountable products**
 - After positioning the gasket in the groove of the flange, put the flange back on the component, position all the screws and tighten them by hand until contact.
 - First tightening pass: must imperatively be done crossways and with a relatively low value (see sketch and values hereafter), in order to properly position the gasket.
 - Second tightening pass: must be able to correct de tightening inhomogeneities; the order of tightening the screws staying the same.
 - From the third to the last tightening pass: it must achieve the desired nominal effort; i.e. the specified torque. The screws tightening must always be done in the same order as previously. To give the gasket the time to creep, it is recommended to wait few minutes before doing the last pass.
 - For components with flanges with 10 holes, six tightening passes are recommended in order to achieve the recommended tightening torque.
 - If dispersions exist between the screws, it is recommended to carry out other passes, until obtaining the correct torque on all the screws.
 - The values of torque tightening and the order for the cross tightening of the screws are as follow:

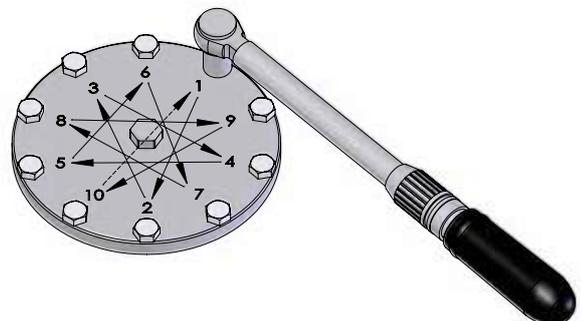
Tightening for screws M8 CI 10-9 - Flange 6 holes BDCY - TURBOIL-F 2505 S/MMS --> 3011 S/MMS	
Stage 1	Tightening the screws by hand
Stage 2	Tightening torque : 5 Nm
Stage 3	Tightening torque : 10 Nm
Stage 4	Tightening torque : 20 Nm
Stage 5	Tightening torque : 30 Nm



Tightening for screws M8 CI 10-9 - Flange 8 holes ACY - BCY - TURBOIL-F 15017 S/MMS --> 30025 S-MMS	
Stage 1	Tightening the screws by hand
Stage 2	Tightening torque : 5 Nm
Stage 3	Tightening torque : 10 Nm
Stage 4	Tightening torque : 20 Nm
Stage 5	Tightening torque : 30 Nm



Tightening for screws M10 CI 10-9 - Flange 10 holes BACY - BBCY - TURBOIL-F 7011 S/MMS --> 9017 S/MMS	
Stage 1	Tightening the screws by hand
Stage 2	Tightening torque : 5 Nm
Stage 3	Tightening torque : 10 Nm
Stage 4	Tightening torque : 20 Nm
Stage 5	Tightening torque : 35 Nm
Stage 6	Tightening torque : 45 Nm
Stage 7	Tightening torque : 55 Nm

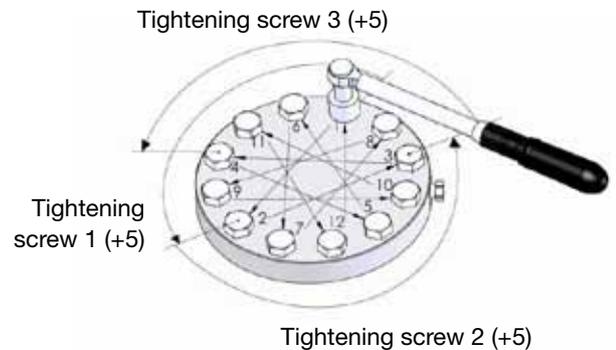




General assembly precautions

→ COMPONENT INSTALLATION

Tightening for screws M 16 Cl 10-9 - Flange 12 holes BCY-P14	
Step 1	Tightening the screws by hand
Step 2	Tightening torque : 25 Nm
Step 3	Tightening torque : 50 Nm
Step 4	Tightening torque : 100 Nm



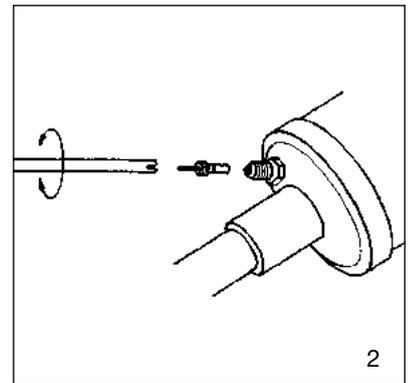
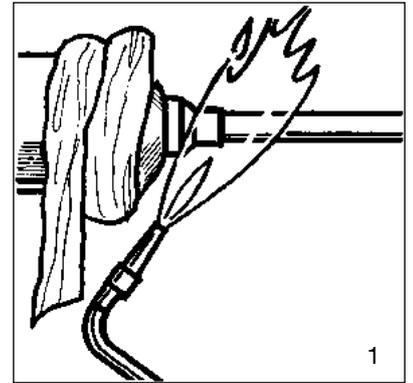
- Before any intervention, ensure among other things that :
 - The electric part of the installation is confined ;
 - The components to be installed are available, in order not to open the circuit by anticipation ;
 - The components are at ambient temperatures in order to avoid burns. If necessary, wear the appropriate protections ;
 - The installation is empty of refrigerant / gas. Vacuum (-1 Bar) can be made in the products during maintenance operations. During an operation of maintenance, the refrigerant / gas of the installation has to be recovered and recycled in conformity with the regulation in force;
 - The components are protected from bumps in order to avoid damages to the paint and the anticorrosion protection ;
 - The components are protected from seismic and fire risks.
- After each installation or replacement of a component, always check that :
 - The air tightness of this component and its assembling on the circuit, according to the regulation in force ;
 - There is no vibration in the pipe.
- Perform all recommended operations according to the art and to the intervention to perform: circuit rinsing, draining, air tightening, depressurization, refrigerant load...
- The persons responsible for commissioning of CARLY components must ensure that these components will never be exposed to vibration stresses that could cause resonance. Such situation would definitely cause breakage that would be harmful for the installation.
This monitoring must apply most particularly to “on-board” installations.



General assembly precautions

→ ASSEMBLING COMPONENTS WITH SOLDER CONNECTIONS

- Never braze nor solder on an installation charged with non-confined refrigerant (preferably, the refrigerant has to be stored in the liquid receiver).
- Rigorously clean the internal and external fitting surfaces.
- Ensure that the intake material selected matches the materials and refrigerants used.
- The component's body must imperatively be cooled during brazing: with a humid cloth (**sketch No. 1**), or with **CARLYCOOL** calories discharger (refer to chapter 95).
- Seals and removable internal elements of CARLY flanged products (**BDCY, BCY, BCY-HP, ACY, BBCY, BACY, FILTRY, VCYLS, VCYR**) must absolutely be removed, before the operation of brazing, and reinstalled only after the heated areas have been cooled to the ambient temperature again.
- Some CARLY components contain "Schrader" type access valves. In the case of brazed components, be careful to remove the internal mechanism of these valves before brazing, in order to preserve the built-in gasket (**sketch No. 2**).
- For the brazing of connections, use a wide flame welding torch; this one has to be adjusted in order to ensure a quick and uniform heating of the connections and be oriented only towards them, avoiding any overheating; an excessive heating of the component paint may produce toxic fumes and trigger serious injuries: the brazing of components has to be performed only in perfectly ventilated areas.
- **ATTENTION:** products of brazing and stripper flows may produce some toxic fumes; read carefully the instructions of the different suppliers and follow their safety rules. It is important to plan an efficient suction at the level of the flame, with an appropriate outlet.
- The intake metal has to melt at the contact of the heated part, and not at the contact of the flame; on a copper tube, it is important to always move the flame in order to avoid any overheating of the tube; the dark red color is an indicator of the limit temperature not to excess; above this temperature, the copper pipe might suffer irreversible damages; in case of parts with different conductivities or weights, a soft pre heating has to be performed on the part with the highest thermal inertia.
- During brazing, use an inert protection gas inside the component (nitrogen for instance) in order to prevent the formation of oxide particles that are going to contaminate the circuit; the protection gas flow must preferably follow the direction of the product flow, in order to avoid damages to sensitive internal elements (**DCYs'** felt-glass filtrating medium, for instance).
- Check the air tightness (with the leak detector **CARLYLOC**) in order to check there is no leak in the different assembling parts and to be in conformity with the regulations in force.
- Eliminate by brushing the residues of brazing fluxes and the possible dirts present outside the heated surfaces.
- A visual check of the brazing made will be the first mandatory control to make, in order to realize the external state of the brazing; it enables to remark the defaults arising on the area (porosity, bad filling, irregular shape of the brazing cord, link defaults).
- After cleaning, protect the heated areas of steel connectors, by the application of paint or other anticorrosion protection products/devices such as **CARLYCOAT**, or cold galvanization, for instance.
- Always close the ends of used components after replacement, in order to avoid the possible release of refrigerants and oils. The elimination of these components must follow the regulations in force.

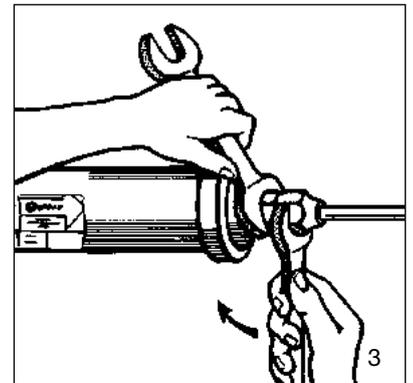




General assembly precautions

→ ASSEMBLING COMPONENTS WITH SCREW CONNECTIONS

- Never unscrew the components in an installation full of non confined refrigerant (preferably, store the refrigerant in the liquid receiver).
- Systematically check the dudgeon condition on the copper piping, in order to ensure good air tightness of the assembly; if copper gaskets are used, check their good positioning and replace them after each product removal.
- In order to ensure a better confinement of the installations including components with connections to screw on dudgeons, CARLY highly recommends to replace the dudgeon device by the installation of connection sets, type **KRCY**. See photo and chapter 71 of the technical catalogue.
- Tightening of Flare connections should imperatively be performed with two wrenches, positioned on the six faces of the connections, in order to prevent piping twisting (**sketch No. 3**).
- Comply with the tightening torque recommended in the “**Specific recommendations**” chapter for each component concerned.
- Check the air tightness (with the leak detector **CARLYLOC**) in order to check there is no leak in the different assembling parts and to be in conformity with the regulations in force.
- Always close the ends of used components after replacement, in order to avoid the possible release of refrigerants and oils. The elimination of these components must follow the regulations in force.



→ PERIODICAL INTERVENTIONS

- Plan a periodical control as often as necessary and in conformity with the regulation in force, of the installation air tightness and of the state of the refrigerant and the oil (moisture, acidity, dirt...) in order not to trouble the efficiency of the installation.
- Make a visual check of the external area of all components on the circuit, in order to detect:
 - Bumps ;
 - Points of corrosion ;
 - Traces of refrigerant leak ;
 - Seepage of oil ;
 - Traces of moisture or ice in service ;
 - Vibration of the pipes connected to components ;
 - Damages to component supports.Correct the defaults found.
- Monitor the pressure losses of dehydrating, acid neutralizing and filtering components generally located on the liquid, suction and oil lines. Their contaminant neutralization capacities are by definition limited in time. The saturation and obstruction time depends on the contaminant types and amounts and depends of course on the capacity of the component selected.
- After each opening of the circuit, the **DCY** filter drier or the **CCY 42/48/100 HP** and **PLATINIUM 48** drying cores have to be replaced in order to keep the circuit dry enough.
- Replace systematically synthetic air-tightness gaskets after each intervention that requires the dismantling or the opening of flanged products.
- During any intervention, the opening of the refrigeration circuit must be as short as possible; if it were not the case, close the system as hermetically as possible, and charge it with a slight overpressure of dry nitrogen, in order to avoid the introduction of moisture.
- During maintenance operations, the refrigerants of the installation have to be recovered and recycled according to the regulation in force.



General assembly precautions

➔ SPECIAL PRECAUTIONS FOR COMPONENTS USED IN CO₂ SUBCRITICAL APPLICATIONS

- The maximal working pressure and the power variations of the installation must be taken into account as of its design, in order to select all the components consequently.
- The pressure of the circuit during the stop phases must also be taken into account, because it can be very high, due to the pressure equalization according to the ambient temperature; several solutions exist to limit and control this pressure when the installation is stopped.
 - Design of the installation allowing to resist to this pressure.
 - Implementation of a « buffer » volume of storage or expansion (receiver).
 - Installation of a secondary circuit with valve or solenoid valve, allowing the fluid transfer to the coldest point, or the less high in pressure of the installation.
 - Implementation of a small separate refrigeration unit, to maintain the liquid temperature at a pressure lower than the maximal working pressure ; it is so far the most effective technical solution, but with a major drawback, which is the power failure (safety unit to be considered, or backup power supply).
- The hot gas defrost, frequently used with CO₂ for low temperatures applications, generates also high pressures (to take in consideration)
- The implementation on the liquid line of a filter drier **DCY** or of a drier shell **BCY-HP** equipped with drying cores **CCY HP** or **PLATINIUM**, is highly recommended. Serious problems can occur in the presence of moisture, such as expansion valve blocking and formation of dry ice even carbonic acid. To avoid this, it is imperative to limit the circuit openings in order to avoid air introduction, causing the condensation in the pipes, and to proceed to a high evacuation of the installation, before any commissioning or restarting.
- For an operation with CO₂ at low temperature, provide thermal insulation on the components which can be covered by frost.
- There is no incompatibility between CO₂ and the main metallic materials commonly used in refrigeration systems (steel, copper, brass...)
- On the other hand, there is a real compatibility issue between CO₂ and polymers. For example, swelling phenomena and internal explosion of the seal are possible. Carly components do not have polymer gaskets directly in contact with CO₂.



Weights and packaging

→ DCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DCY 032	0,33	0,30	24
DCY 032 S & MMS	0,33	0,30	24
DCY 033	0,33	0,30	24
DCY 033 S & MMS	0,33	0,30	24
DCY 052	0,38	0,35	24
DCY 052 S & MMS	0,38	0,35	24
DCY 053	0,38	0,35	24
DCY 053 S & MMS	0,38	0,35	24
DCY 082	0,41	0,40	24
DCY 082 S & MMS	0,43	0,40	24
DCY 083	0,43	0,40	24
DCY 083 S & MMS	0,40	0,35	24
DCY 084	0,48	0,45	24
DCY 084 S & MMS	0,48	0,45	24
DCY 162	0,94	0,90	16
DCY 162 S & MMS	0,94	0,90	16
DCY 163	0,94	0,90	16
DCY 163 S & MMS	0,94	0,90	16
DCY 164	0,99	0,95	16
DCY 164 S & MMS	0,99	0,95	16
DCY 165	1,04	1,00	16
DCY 165 S/MMS	1,04	1,00	16

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DCY 302	1,42	1,35	12
DCY 303	1,42	1,35	12
DCY 303 S & MMS	1,42	1,35	12
DCY 304	1,47	1,40	12
DCY 304 S & MMS	1,47	1,40	12
DCY 305	1,57	1,50	12
DCY 305 S/MMS	1,57	1,50	12
DCY 307 S/MMS	1,62	1,55	12
DCY 414	2,18	2,10	6
DCY 415	2,28	2,20	6
DCY 415 S/MMS	2,28	2,20	6
DCY 417 S/MMS	2,33	2,25	6
DCY 755	2,78	2,70	6
DCY 756	2,78	2,70	6
DCY 756 S & MMS	2,78	2,70	6
DCY 967 S/MMS	2,83	2,75	6
DCY 969 S & MMS	2,93	2,85	6

→ DCY-P6

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DCY-P6 053	0,33	0,30	1
DCY-P6 053 S & MMS	0,33	0,30	1
DCY-P6 164	1,04	1,00	1
DCY-P6 164 S& MMS	1,04	1,00	1
DCY-P6 305	1,57	1,50	1
DCY-P6 305 S/MMS	1,57	1,50	1



Weights and packaging

→ DCY-P14

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DCY-P14 052 S/MMS	1,09	0,96	1
DCY-P14 053 S/MMS	1,09	0,96	1
DCY-P14 163 S/MMS	2,23	2,10	1
DCY-P14 164 S/MMS	2,23	2,10	1
DCY-P14 165 S/MMS	2,23	2,10	1
DCY-P14 304 S/MMS	3,03	2,90	1
DCY-P14 305 S/MMS	3,03	2,90	1
DCY-P14 415 S/MMS	4,49	4,36	1

→ DDCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DDCY 082	0,43	0,40	24
DDCY 082 S & MMS	0,43	0,40	24
DDCY 083	0,43	0,40	24
DDCY 083 S & MMS	0,43	0,40	24
DDCY 084	0,53	0,50	24
DDCY 084 S & MMS	0,53	0,50	24
DDCY 163	0,94	0,90	16

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DDCY 163 S & MMS	0,94	0,90	16
DDCY 164	0,99	0,95	16
DDCY 164 S & MMS	0,99	0,95	16
DDCY 165	1,04	1,00	16
DDCY 165 S/MMS	1,04	1,00	16
DDCY 305	1,52	1,45	12
DDCY 305 S/MMS	1,52	1,45	12
DDCY 307 S/MMS	1,52	1,45	12

→ DDNCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
DDNCY 083	0,43	0,40	24
DDNCY 164	0,99	0,95	16
DDNCY 305	1,57	1,50	12



Weights and packaging

→ RCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
RCY 502-3 S	0,38	0,35	1
RCY 522 S & MMS	0,48	0,45	1
RCY 523 S & MMS	0,48	0,45	1
RCY 743 S & MMS	1,03	1,00	1
RCY 744 S & MMS	1,03	1,00	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
RCY 924 S & MMS	1,73	1,65	1
RCY 925 S/MMS	2,43	2,35	1

→ TSGY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TSGY 052	0,48	0,45	24
TSGY 082	0,59	0,55	16
TSGY 083	0,64	0,60	12
TSGY 163	1,14	1,10	12
TSGY 164	1,24	1,20	12

→ BDCY / BBCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BDCY 424 S & MMS	2,85	2,60	1
BDCY 425 S/MMS	2,90	2,65	1
BDCY 427 S & MMS	2,95	2,70	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BBCY 20017 S/MMS	15,70	14,40	1
BBCY 20021 S & MMS	15,80	15,10	1
BBCY 30021 S & MMS	18,80	18,05	1
BBCY 40017 S/MMS	21,00	20,10	1
BBCY 40021 S & MMS	22,20	21,30	1
BBCY 40025 S & MMS	23,90	23,00	1



Weights and packaging

→ BCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BCY 485 S/MMS	4,45	4,20	1
BCY 487 S & MMS	4,55	4,30	1
BCY 489 S & MMS	4,65	4,40	1
BCY 4811 S/MMS	4,70	4,45	1
BCY 4813 S & MMS	4,80	4,55	1
BCY 4817 S/MMS	5,05	4,80	1
BCY 967 S & MMS	5,90	5,60	1
BCY 969 S & MMS	5,95	5,65	1
BCY 9611 S/MMS	6,15	5,85	1
BCY 9613 S & MMS	6,25	5,95	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BCY 9617 S/MMS	6,40	6,10	1
BCY 1449 S & MMS	7,20	6,85	1
BCY 14411 S/MMS	7,40	7,05	1
BCY 14413 S & MMS	7,45	7,10	1
BCY 14417 S/MMS	7,70	7,35	1
BCY 19213 S & MMS	8,65	8,25	1
BCY 19217 S/MMS	9,05	8,65	1

→ BCY-HP

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BCY-HP 485 S/MMS	4,45	4,20	1
BCY-HP 487 S & MMS	4,55	4,30	1
BCY-HP 489 S & MMS	4,65	4,40	1
BCY-HP 4811 S/MMS	4,70	4,45	1
BCY-HP 4813 S & MMS	4,80	4,55	1
BCY-HP 4817 S/MMS	5,05	4,80	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BCY-HP 967 S & MMS	5,90	5,60	1
BCY-HP 969 S & MMS	5,95	5,65	1
BCY-HP 9611 S/MMS	6,15	5,85	1
BCY-HP 9613 S & MMS	6,25	5,95	1
BCY-HP 9617 S/MMS	6,40	6,10	1

→ BCY-P14

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BCY-P14 485 S/MMS	23,70	22,50	1
BCY-P14 487 S/MMS	23,70	22,50	1
BCY-P14 489 S & MMS	23,70	22,50	1
BCY-P14 4811 S/MMS	23,70	22,50	1
BCY-P14 4813 S & MMS	23,70	22,50	1
BCY-P14 967 S/MMS	27,90	26,50	1
BCY-P14 969 S & MMS	27,90	26,50	1
BCY-P14 9611 S/MMS	27,90	26,50	1
BCY-P14 9613 S & MMS	27,90	26,50	1



Weights and packaging

→ BDCY / BACY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BDCY 424 S & MMS	2,85	2,60	1
BDCY 425 S/MMS	2,90	2,65	1
BDCY 427 S & MMS	2,95	2,70	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
BACY 10021 S & MMS	13,30	12,70	1
BACY 10025 S & MMS	13,40	12,80	1
BACY 10029 S & MMS	13,50	12,90	1
BACY 10033 S & MMS	14,40	13,80	1
BACY 20025 S	16,40	15,70	1
BACY 20029 S & MMS	16,60	15,90	1
BACY 20033 S & MMS	16,90	16,20	1
BACY 40033 S & MMS	23,80	22,90	1

→ ACY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
ACY 489 S & MMS	4,60	4,35	1
ACY 4811 S/MMS	4,70	4,45	1
ACY 4813 S & MMS	4,85	4,60	1
ACY 4817 S/MMS	5,05	4,80	1
ACY 4821 S & MMS	5,45	5,20	1
ACY 4825 S & MMS	5,75	5,50	1
ACY 9617 S/MMS	6,70	6,40	1
ACY 9621 S & MMS	6,85	6,55	1
ACY 9625 S & MMS	7,15	6,85	1
ACY 14417 S/MMS	7,65	7,30	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
ACY 14421 S & MMS	8,20	7,85	1
ACY 14425 S & MMS	8,45	8,10	1
ACY 19217 S/MMS	8,90	8,50	1
ACY 19221 S & MMS	9,60	9,20	1
ACY 19225 S & MMS	9,90	9,50	1

→ CCY / PLATINIUM

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CCY 42 HP	0,77	0,68	15
CCY 48 HP	0,90	0,79	15
CCY 100 HP	1,75	1,52	6
PLATINIUM 48	0,90	0,79	15
CCY 42 N	0,62	0,53	15
CCY 48 N	0,81	0,70	15
CCY 100 N	1,58	1,36	6

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CCY 42 F	0,15	0,06	6
CCY 48 F	0,18	0,09	15
CCY 100 F	0,14	0,13	6
CCY 42 I	0,19	0,10	6
CCY 48 I	0,21	0,12	15
CCY 100 I	0,27	0,18	6
CCY 48 HU	0,41	0,30	15



Weights and packaging

→ VCYL

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
VCYL 12	0,11	0,10	1	VCYL 32 S & MMS	0,12	0,10	1
VCYL 13	0,21	0,20	1	VCYL 33 S & MMS	0,12	0,10	1
VCYL 14	0,26	0,25	1	VCYL 34 S & MMS	0,17	0,15	1
VCYL 15	0,31	0,30	1	VCYL 35 S/MMS	0,22	0,20	1
VCYL 22	0,16	0,15	8	VCYL 36 S & MMS	0,25	0,22	1
VCYL 23	0,21	0,20	8	VCYL 37 S/MMS	0,28	0,25	1
VCYL 24	0,26	0,25	1	VCYL 39 S & MMS	0,28	0,25	1
VCYL 25	0,29	0,28	1	VCYL 52 S & MMS	0,12	0,10	1
				VCYL 53 S & MMS	0,12	0,10	1
				VCYL 54 S & MMS	0,17	0,15	1
				VCYL 55 S/MMS	0,22	0,20	1

→ VCYLS

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
VCYLS 5	0,11	0,10	10	VCYLS 13	0,11	0,10	10
VCYLS 7	0,11	0,10	10	VCYLS 17	0,11	0,10	10
VCYLS 9	0,11	0,10	10	VCYLS 21	0,11	0,10	10
VCYLS 11	0,11	0,10	10				

→ FILTRY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FILTRY 3 S & MMS	0,31	0,30	16
FILTRY 4 S & MMS	0,31	0,30	16
FILTRY 5 S & MMS	0,31	0,30	16

→ FILTRY-P9

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FILTRY-P9 2 S	0,31	0,30	1
FILTRY-P9 3 S	0,31	0,30	1
FILTRY-P9 4 S	0,31	0,30	1
FILTRY-P9 5 S/MMS	0,31	0,30	1



Weights and packaging

→ FCY

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
FCY 702	0,39	0,35	16	FCY 895	0,67	0,60	1
FCY 702 S & MMS	0,39	0,35	16	FCY 895 S/MMS	0,67	0,60	1
FCY 703	0,44	0,40	16	FCY 896 S & MMS	0,67	0,60	1
FCY 703 S & MMS	0,44	0,40	16	FCY 897 S & MMS	0,72	0,65	1
FCY 894	0,57	0,50	1	FCY 899 S & MMS	0,72	0,65	1
FCY 894 S & MMS	0,57	0,50	1	FCY 8911 S/MMS	0,92	0,85	1

→ FCY-P6

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FCY-P6 502	0,28	0,25	1
FCY-P6 503	0,28	0,25	1

→ FACY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FACY 283	0,94	0,90	1
FACY 284	0,99	0,95	1
FACY 285	1,04	1,00	1
FACY 285 S/MMS	1,04	1,00	1
FACY 286 S & MMS	1,04	1,00	1
FACY 287 S & MMS	1,04	1,00	1
FACY 289 S & MMS	1,14	1,10	1
FACY 489 S & MMS	1,77	1,70	1
FACY 4811 S/MMS	1,97	1,90	1
FACY 4813 S & MMS	2,07	2,00	1



Weights and packaging

→ NCY / FNCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
NCY 63	0,43	0,40	1
NCY 63 S & MMS	0,43	0,40	1
NCY 73	0,99	0,95	1
NCY 73 S & MMS	0,99	0,95	1
NCY 74	1,04	1,00	1
NCY 74 S & MMS	1,04	1,00	1
NCY 75	1,54	1,50	1
NCY 75 S/MMS	1,54	1,50	1
NCY 76	1,54	1,50	1
NCY 76 S & MMS	1,54	1,50	1
NCY 77 S & MMS	1,59	1,55	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
FNCY 283	1,09	1,05	1
FNCY 284	1,14	1,10	1
FNCY 285	1,19	1,15	1
FNCY 285 S/MMS	1,19	1,15	1
FNCY 286 S & MMS	1,22	1,17	1
FNCY 287 S & MMS	1,24	1,20	1
FNCY 489 S & MMS	2,22	2,15	1
FNCY 4811 S/MMS	2,42	2,35	1
FNCY 4813 S & MMS	2,47	2,40	1

→ SCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
SCY 30 S & MMS	0,38	0,35	24
SCY 40 S & MMS	0,38	0,35	24
SCY 50 S/MMS	0,38	0,35	24
SCY 60 S & MMS	1,02	0,95	6
SCY 70 S & MMS	1,12	1,05	6
SCY 90 S & MMS	1,57	1,50	6

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
SCY 110 S/MMS	1,72	1,65	6
SCY 130 S & MMS	1,82	1,75	6
SCY 170 S/MMS	6,55	6,20	1
SCY 210 S & MMS	10,25	9,85	1
SCY 250 S & MMS	14,10	13,70	1

→ SCY-P6

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
SCY-P6 30 S & MMS	0,41	0,38	1
SCY-P6 40 S & MMS	0,41	0,38	1
SCY-P6 50 S/MMS	0,41	0,38	1
SCY-P6 60 S & MMS	1,32	1,27	1
SCY-P6 70 S/MMS	1,32	1,27	1



Weights and packaging

→ SCY-P14

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
SCY-P14 30 S/MMS	1,33	1,20	1
SCY-P14 40 S/MMS	1,33	1,20	1
SCY-P14 50 S/MMS	1,33	1,20	1
SCY-P14 60 S & MMS	3,13	3,00	1
SCY-P14 70 S/MMS	3,13	3,00	1
SCY-P14 90 S & MMS	7,13	7,00	1
SCY-P14 110 S/MMS	7,13	7,00	1

→ EVCYAC

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
EVCYAC 2 S et MMS	0,06	0,06	1
EVCYAC 3 S & MMS	0,07	0,07	1
EVCYAC 4 S et MMS	0,10	0,10	1
EVCYAC 5 S & MMS	0,15	0,15	1
EVCYAC 6 S et MMS	0,25	0,25	1
EVCYAC 7 S & MMS	0,25	0,25	1
EVCYAC 9 S et MMS	0,43	0,42	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
EVCYAC 11 S/MMS	0,77	0,76	1
EVCYAC 13 S et MMS	1,36	1,35	1
EVCYAC 17 S/MMS	2,13	2,12	1
EVCYAC 21 S et MMS	3,90	3,85	1
EVCYAC 25 S & MMS	5,65	5,60	1
EVCYAC 29 S et MMS	8,60	8,55	1
EVCYAC 33 S & MMS	9,20	9,15	1

→ EVCYDEAC

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
EVCYDEAC 2 S et MMS	0,07	0,07	1
EVCYDEAC 3 S & MMS	0,12	0,12	1
EVCYDEAC 4 S et MMS	0,17	0,17	1
EVCYDEAC 5 S & MMS	0,26	0,26	1
EVCYDEAC 6 S et MMS	0,37	0,37	1
EVCYDEAC 7 S & MMS	0,42	0,42	1
EVCYDEAC 9 S et MMS	0,69	0,68	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
EVCYDEAC 11 S/MMS	1,16	1,15	1
EVCYDEAC 13 S et MMS	1,50	1,49	1
EVCYDEAC 17 S/MMS	3,80	3,79	1
EVCYDEAC 21 S et MMS	6,45	6,40	1
EVCYDEAC 25 S & MMS	9,00	8,95	1
EVCYDEAC 29 S et MMS	12,10	12,05	1
EVCYDEAC 33 S & MMS	13,20	13,15	1



Weights and packaging

→ TSCYS

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
TSCYS 1002	0,21	0,21	1	TSCYS 1502	0,29	0,29	1
TSCYS 1002 S & MMS	0,16	0,16	1	TSCYS 1502 S & MMS	0,25	0,25	1
TSCYS 1003	0,30	0,30	1	TSCYS 1503	0,41	0,39	1
TSCYS 1003 S & MMS	0,25	0,25	1	TSCYS 1503 S & MMS	0,37	0,34	1
TSCYS 1004	0,40	0,40	1	TSCYS 1504	0,56	0,56	1
TSCYS 1004 S & MMS	0,35	0,35	1	TSCYS 1504 S & MMS	0,45	0,45	1
TSCYS 1005	0,55	0,54	1	TSCYS 1505	0,71	0,71	1
TSCYS 1005 S & MMS	0,41	0,40	1	TSCYS 1505 S & MMS	0,40	0,39	1

→ RLHCY

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
RLHCY 15	1,90	1,55	1	RLHCY 150	16,60	16,00	1
RLHCY 25	3,41	3,11	1	RLHCY 200	20,60	20,00	1
RLHCY 30	3,86	3,56	1	RLHCY 250	25,20	23,00	1
RLHCY 45	5,95	5,55	1	RLHCY 300	31,74	29,54	1
RLHCY 60	7,40	6,80	1	RLHCY 400	39,94	37,74	1
RLHCY 75	8,73	8,13	1	RLHCY 500	47,90	45,70	1
RLHCY 90	10,00	9,40	1	RLHCY 600	57,70	55,50	1
RLHCY 120	12,40	11,80	1	RLHCY 700	63,60	62,40	1

→ RLVCY

CARLY references	Unit weight kg		Packaging number of pieces	CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging			With packaging	Without packaging	
RLVCY 09	1,50	1,10	1	RLVCY 120	10,60	10,10	1
RLVCY 15	2,15	1,75	1	RLVCY 150	19,65	19,15	1
RLVCY 20	2,87	2,47	1	RLVCY 200	24,27	23,67	1
RLVCY 25	3,36	3,11	1	RLVCY 250	28,92	28,32	1
RLVCY 30	3,51	3,16	1	RLVCY 300	34,80	34,00	1
RLVCY 40	4,36	4,26	1	RLVCY 400	42,10	41,30	1
RLVCY 45	5,85	5,55	1	RLVCY 500	50,60	49,40	1
RLVCY 60	7,10	6,80	1	RLVCY 600	57,20	56,00	1
RLVCY 75	8,48	8,13	1	RLVCY 700	64,70	63,50	1
RLVCY 90	10,35	10,00	1				



Weights and packaging

→ VCYR

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
VCYR 32	0,10	0,10	1
VCYR-W 32	0,10	0,10	1

→ LCY / LCYE / LCY-ST

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
LCY 04 S & MMS	1,27	1,16	6
LCY 14 S & MMS	1,73	1,61	6
LCY 15 S/MMS	1,82	1,71	6
LCY 16 S & MMS	1,98	1,86	6
LCY 25 S/MMS	2,48	2,24	1
LCY 26 S & MMS	3,60	3,20	1
LCY 27 S & MMS	2,71	2,48	1
LCY 47 S & MMS	3,38	3,14	1
LCY 49 S & MMS	5,54	5,27	1
LCY 69 S & MMS	6,85	6,53	1
LCY 89 S & MMS	8,18	7,85	1
LCY 611 S/MMS	9,45	9,10	1
LCY 811 S/MMS	9,74	9,41	1
LCY 813 S & MMS	11,95	11,60	1
LCY 1011 S/MMS	11,89	11,39	1
LCY 1013 S & MMS	12,57	11,92	1
LCY 1517 S/MMS	18,70	17,50	1
LCY 1817 S/MMS	26,00	24,80	1
LCY 3617 S/MMS	45,40	42,90	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
LCY 3621 S & MMS	47,10	45,70	1
LCY 3625 S & MMS	48,75	47,35	1
LCY 5021 S & MMS	58,50	57,10	1
LCY 5025 S & MMS	60,50	59,10	1
LCY 7025 S & MMS	76,40	75,00	1
LCY 7029 S & MMS	80,40	79,00	1
LCY-ST 89 S	9,00	8,50	1
LCY-ST 1011 S/MMS	15,10	14,50	1
LCY-ST 1013 S	15,60	15,00	1
LCYE 25 S & MMS	2,73	2,49	1
LCYE 26 S & MMS	2,92	2,69	1
LCYE 47 S & MMS	3,38	3,14	1
LCYE 69 S & MMS	7,44	7,12	1
LCYE 811 S/MMS	10,60	10,40	1
LCYE 1013 S & MMS	13,25	12,80	1
LCYE 1517 S & MMS	22,35	21,85	1
LCYE 3621 S & MMS	48,90	47,50	1
LCYE 3625 S & MMS	53,40	52,00	1

→ CONDOR-H

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CONDOR-H 150	5,65	5,20	1
CONDOR-H 250	8,65	8,20	1
CONDOR-H 500	11,30	11,00	1
CONDOR-H 750	7,65	7,20	1
CONDOR-H 1000	14,30	14,00	1



Weights and packaging

→ CONDOR-V

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CONDOR-V 100	4,50	4,20	1
CONDOR-V 150	5,65	5,20	1
CONDOR-V 240	5,65	5,20	1
CONDOR-V 500	11,10	10,80	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CONDOR-V 1000	14,30	14,00	1
CONDOR-V 1400	7,65	7,20	1
CONDOR-V 2500	26,10	25,50	1

→ TURBOIL® / TURBOIL-F®

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TURBOIL 1503 S & MMS	2,90	2,65	1
TURBOIL 1504 S & MMS	3,35	3,10	1
TURBOIL 2505 S/MMS	3,55	3,25	1
TURBOIL 3006 S & MMS	3,75	3,45	1
TURBOIL 3007 S & MMS	4,20	3,90	1
TURBOIL 3009 S & MMS	4,25	3,95	1
TURBOIL 3011 S/MMS	5,55	5,20	1
TURBOIL 6009 S & MMS	4,90	4,55	1
TURBOIL 6011 S/MMS	6,25	5,90	1
TURBOIL 7011 S/MMS	8,50	8,10	1
TURBOIL 8013 S & MMS	10,80	10,40	1
TURBOIL 9017 S/MMS	11,35	10,95	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TURBOIL-F 2505 S/MMS	5,25	4,95	1
TURBOIL-F 3007 S & MMS	5,60	5,30	1
TURBOIL-F 3009 S & MMS	6,10	5,75	1
TURBOIL-F 3011 S/MMS	7,20	6,85	1
TURBOIL-F 7011 S/MMS	12,10	11,70	1
TURBOIL-F 8013 S & MMS	14,35	13,95	1
TURBOIL-F 9017 S/MMS	15,90	15,50	1
TURBOIL-F 15013 S & MMS	19,05	17,85	1
TURBOIL-F 15017 S/MMS	22,15	20,95	1
TURBOIL-F 15021 S & MMS	22,85	21,65	1
TURBOIL-F 30025 S & MMS	23,95	22,75	1

→ TURBOIL-R®

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TURBOIL-R 22505 S/MMS	8,20	7,60	1
TURBOIL-R 23007 S & MMS	8,30	7,70	1
TURBOIL-R 23009 S & MMS	8,70	8,10	1
TURBOIL-R 23011 S/MMS	8,80	8,20	1
TURBOIL-R 47009 S & MMS	11,20	10,60	1
TURBOIL-R 47011 S/MMS	11,40	10,80	1
TURBOIL-R 48013 S & MMS	14,80	14,20	1
TURBOIL-R 49017 S/MMS	14,90	14,30	1
TURBOIL-R 77011 S/MMS	14,30	13,70	1
TURBOIL-R 78013 S & MMS	17,40	16,80	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
TURBOIL-R 79017 S/MMS	17,50	16,90	1
TURBOIL-R 127011 S/MMS	19,00	18,40	1
TURBOIL-R 128013 S & MMS	22,20	21,60	1
TURBOIL-R 129017 S/MMS	22,20	21,60	1
TURBOIL-R 815017 S/MMS	25,40	23,20	1
TURBOIL-R 815021 S & MMS	26,20	24,10	1
TURBOIL-R 830025 S & MMS	26,80	24,60	1
TURBOIL-R 1217 S/MMS	27,00	26,40	1
TURBOIL-R 1221 S & MMS	27,70	27,10	1
TURBOIL-R 1225 S & MMS	28,80	28,20	1



Weights and packaging

→ HCYR

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYR 40	4,95	4,60	1
HCYR 80	9,70	9,10	1
HCYR 81	9,30	8,90	1
HCYR 120	13,40	12,80	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYR 121	13,00	12,40	1
HCYR 150	13,50	13,30	1
HCYR 200	21,70	20,90	1
HCYR 300	32,50	31,30	1

→ HCYCT / HCYCTR

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYCT 1	0,16	0,15	1
HCYCT 3	0,16	0,15	1
HCYCT 4	0,16	0,15	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYCT 7	0,16	0,15	1
HCYCTR	0,23	0,20	1

→ HCYF / HCYBF

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYF 52	0,28	0,25	24
HCYF 53	0,28	0,25	24
HCYF 53 S & MMS	0,28	0,25	24
HCYF 83	0,78	0,75	6
HCYF 84	0,83	0,80	6

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYBF 485 S/MMS	4,55	4,30	1
HCYBF 486 S	4,60	4,35	1
HCYBF 486 N	4,70	4,45	1



Weights and packaging

→ HCYF-P6

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYF-P6 52	0,31	0,28	1
HCYF-P6 53	0,31	0,28	1
HCYF-P6 53 S & MMS	0,31	0,28	1
HCYF-P6 83	0,78	0,75	1
HCYF-P6 84	0,83	0,80	1

→ HCYF-P14

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYF-P14 52	1,20	1,07	1
HCYF-P14 52 S/MMS	1,20	1,07	1
HCYF-P14 53	1,20	1,07	1
HCYF-P14 53 S/MMS	1,20	1,07	1

→ HYDROIL

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HYDROIL 163	1,59	1,55	6

→ HCYVP

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYVP 23	0,24	0,23	1
HCYVP 43	0,23	0,22	1
HCYVP 53 S & MMS	0,11	0,10	1



Weights and packaging

→ HCYVI

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYVI 2	0,11	0,11	1
HCYVI 3	0,20	0,20	1
HCYVI 3H	0,16	0,16	1

→ LEVOIL / HCYN 1A

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
LEVOIL 22	1,33	1,15	1
LEVOIL 23	1,33	1,16	1
LEVOIL 23 B0	1,26	0,95	1
LEVOIL 23 SC	1,27	1,10	1
LEVOIL 23 SC2	1,33	1,26	1
LEVOIL 23 SU	1,06	0,98	1
LEVOIL 33 RE	1,50	1,32	1

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
HCYN 1A2	0,48	0,48	1
HCYN 1A3	0,50	0,50	1
HCYN 1A5	0,56	0,56	1
HCYN 1A7	0,58	0,58	1
HCYN 1A9	0,57	0,57	1
HCYN 1A10	0,40	0,40	1
HCYN 1A11	0,46	0,46	1
HCYN 1A14	0,50	0,50	1
HCYN 1A15	0,42	0,42	1

→ CRCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CRCY 2 S & MMS	0,01	0,02	1
CRCY 3 S & MMS	0,09	0,06	1
CRCY 4 S & MMS	0,14	0,13	1
CRCY 5 S/MMS	0,21	0,20	1
CRCY 6 S & MMS	0,26	0,24	1
CRCY 7 S & MMS	0,28	0,25	1



Weights and packaging

→ CRCY-P9

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
CRCY-P9 2 S/MMS	0,07	0,06	1
CRCY-P9 3 S/MMS	0,07	0,06	1
CRCY-P9 4 S/MMS	0,16	0,15	1
CRCY-P9 5 S/MMS	0,21	0,20	1

→ KRCY

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
KRCY 2 S & MMS	0,041	0,040	10
KRCY 3 S & MMS	0,066	0,065	10
KRCY 4 S & MMS	0,091	0,090	10
KRCY 5 S/MMS	0,116	0,115	10

CARLY references	Unit weight kg		Packaging number of pieces
	With packaging	Without packaging	
KRCY 6 S & MMS	0,186	0,185	10
KRCY 23 S & MMS	0,071	0,070	10
KRCY 34 S & MMS	0,101	0,100	10

→ CHEMICAL PRODUCTS

CARLY references	Unit weight kg	Packaging number of pieces
CARLYLOC	0,510	12
CARLYLOC 500	0,570	15
CARLYLOC 5000	5,400	2
CARLYLOC 25000	26,000	1
CARLYCLEAN 500	0,560	15
CARLYCLEAN 5000	5,250	2
CARLYCLEAN 25000	26,000	1
CARLYCLEAN-F	0,517	12
CARLYBIO 500	0,500	15
CARLYBIO 5000	5,250	2
CARLYBIO 25000	26,000	1
CARLYCLIM 150	0,207	12
CARLYCLIM 400	0,500	12
CARLYPRO 500	0,560	15

CARLY references	Unit weight kg	Packaging number of pieces
CARLYPRO 5000	26,000	1
CARLYPRO 25000	5,250	2
CARLYPRO-F	0,509	12
CARLYNET	0,412	12
CARLYCOAT	0,444	12
CARLYSTEEL	0,447	12
TESTOIL-MAS	0,071	18
TESTOIL-POE	0,071	18
TESTOIL-MP	0,140	16
STOPACID-MAS	0,080	18
STOPACID-POE	0,080	18
DETECTOIL-POE	0,071	18
CARLYCOOL	0,650	8
POMPE 5000	2,020	1



General sales terms

■ Updated in December 2013

• ARTICLE 1 - SCOPE OF APPLICATION

The present terms and conditions of sale (hereafter CGV) govern the rights and obligations of CARLY SAS (hereafter designated as «CARLY») and its customer, an entity acting in the capacity of an informed professional (hereafter designated as "Customer"), having ordered products from CARLY (hereafter designated as "Products").

In that the products present particular technical specificities, a document called "NOTICE", mentioned in article 10 of the present document, is provided to the Customer before placing any order. This document is available from CARLY upon simple request. It may also be found in the CARLY technical documentation, as well as on the Internet site www.carly-sa.com.

The Customer acknowledges that it has become familiar with the present CGV and the "NOTICE" before placing its order, which it approves and accepts in all their provisions. Any order from the Customer placed with CARLY is deemed as its adherence without restriction or reservation to the present CGV and to the "NOTICE", which prevail over its eventual terms and conditions of purchase and over any other document to the contrary.

• ARTICLE 2 - ESTABLISHMENT OF THE CONTRACT

Any order placed by the Customer is subject to acceptance by CARLY.

The order is considered as firm and definitive from the time of receipt by the Customer of written order confirmation from CARLY, which confirms that said order has been definitively recorded. This confirmation is deemed as the date of establishment of the sales contract and acceptance of the CGV and the NOTICE.

No order confirmed by CARLY may be cancelled by the customer unless this has been approved in writing by CARLY and provided that the Customer fully indemnifies CARLY for any charge or loss borne by it due to this cancellation.

• ARTICLE 3 - PRICE

The prices of the products sold are those applicable on the order date. They are expressed in Euro and calculated before taxes, free of packaging costs. The final price indicated on the invoice is set according to the specific terms of the order, after applying possible reductions, and after entering the French VAT, as needed, as well as carriage costs on the order date.

Any carriage cost shall be negotiated upon the order, as well as any express shipping cost. A sale price scale is available on request.

CARLY reserves the right to change its rates at any time. However, CARLY agrees to charge order products at the prices indicated on the order.

Clients based outside metropolitan France should inquire about import duties or taxes that may apply, and shall be responsible for declaring and paying such duties and taxes.

• ARTICLE 4 - DELIVERY

Delivery may be made in two ways:

- the Customer takes delivery of the goods ordered in our workshops on the agreed date,
- the delivery is done by a transport company chosen by CARLY. In this case, the timeframes will depend on this company and shall be stated to the Customer, upon request, at the time of order placement.

In any event, the week of shipment indicated at the time of order confirmation is only provided for informational purposes and is under no circumstances guaranteed by CARLY. As a result, no delay in delivery of the Products authorizes the Customer to refuse receipt, cancel the order, delay the payment date for these Products, or request damages from CARLY.

• ARTICLE 5 - RISKS INCURRED

All our merchandise, even that delivered carriage free, is sold as accepted in our warehouses.

In any event, the transport risk is borne in totality by the Customer, which has responsibility for verifying the apparent condition of the Products delivered and, in case of damage or loss, for stating all reservations in writing on the waybill and to exercising all recourse against the transporters, which are solely responsible.

CARLY is within its rights to refuse a shipment of Products in case of force majeure or in case of refusal of payment by the Customer for a previous order.

• ARTICLE 6 - CONFORMITY TO THE ORDER

No claim will be acknowledged by CARLY unless it is made within a period of FORTY-EIGHT (48) hours following receipt of the Products, by fax or e-mail and by registered letter, and confirmed on the waybill. Beyond this timeframe, the Products of CARLY shall be deemed as conforming in quantity and quality to the order.

No Product return will be able to take place without written approval from CARLY, which implies no acceptance by CARLY of the grounds alleged by the Customer to support the return of the Products.

In case of a delivery that does not conform to the order, the guarantee from CARLY is limited to the supply of replacement Products, to the exclusion of all damages.

• ARTICLE 7 - CLAUSE OF RESERVATION OF OWNERSHIP

Ownership of the Products sold shall only be transferred to the Customer after payment of the entire price billed and the VAT. In the event of a collections procedure against the Customer, CARLY reserves the right to reclaim the Products sold and for which payment has not been received. For the duration of the period of reservation of ownership, the risks related to the Products are the responsibility of the Customer once they have been accepted by the transporter or the Customer.

• ARTICLE 8 - BILLING AND PAYMENT

The minimum order amount is EUR 350 before taxes.

Payments will have to be sent to the Service Comptable (Accounting Department) of CARLY S.A.S - ZI de Braille - 69380 LISSIEU - FRANCE.

Unless otherwise indicated in writing and agreed by the parties, all invoices are payable in cash before shipment.

The absence of total or partial payment for the Products by the due date results, rightfully and without prior notice, in:

- 1) the application of a late penalty equal to three times the legal rate of interest, being specified that this rate is equal to the interest rate applied by the Central European Bank to its most recent refinancing operation, increased by 10 percentage points, calculated on the amount including tax remaining due, from the payment due date to the date that it is paid in full,
- 2) immediate forfeiture of the term of payment for amounts remaining due to CARLY by the Customer and not yet come due. The eventual discounts and rebates that are separate from the invoices are only due to the Customer to the extent that his payments are up-to-date. Furthermore, any prior payment incidents suspend orders in progress.

- 3) Application of a statutory lump-sum indemnification of € 40 for coverage of collection costs, and full indemnification of costs actually incurred by the company above that amount.

• ARTICLE 9 - CONFIDENTIALITY

Studies, drawings, schematics and documents given or sent by CARLY shall remain its property. They shall not be disclosed to any third party for any reason, or performed without its written authorisation, under penalty of damages.

• ARTICLE 10 - CHARACTERISTICS OF THE PRODUCTS - NOTICE

To adapt to any legal or regulatory requirement, French or European, as well as for reasons related to safety and technical progress, CARLY reserves the right to modify the characteristics and design of its Products at any time, as well as of those mentioned in an order. The Customer who has placed an order shall be notified about the abovementioned modifications in writing; his absence of opposition, sent by fax or e-mail and by registered letter, is deemed as acceptance of these modifications.

The specificities of these Products require technical validation by the Customer, which is an informed professional. As a result:

- 1) a document entitled "NOTICE" is attached to any Product description, regardless of the medium, which details said specificities as well as the precautions to be taken by the Customer before any order;
- 2) only the Product effectively sold enters into the contractual scope, to the exclusion of all catalogues or other documentation describing the Products. In that these commercial documents only offer an initial presentation of the Products, in no way do they engage the liability of CARLY, even if they contain errors.

• ARTICLE 11 - GUARANTEE

11.1 The Products of CARLY are guaranteed for ONE (1) year starting from the date of shipment. This guarantee is strictly limited to providing a Product to replace the defective Product. This guarantee shall not be taken into account:

- 1) if the material is not used under the conditions as stated in the document called "NOTICE", in the written instructions and in the various technical documents of CARLY,
- 2) if the Customer has not validated the Products beforehand in conformity with the provisions of the NOTICE,
- 3) for deterioration resulting from the addition of equipment and accessories which are not included among the Products of CARLY,
- 4) if the Customer modified the equipment without having informed CARLY and provided an explicit plan followed by a written agreement from CARLY. The guarantee clause will not be able to be invoked in case of negligence, accidental damage or normal wear and tear, as well as in case of non-respect of our recommendations.

11.2 Under this guarantee, CARLY accepts to provide the Product which replaces the defective Product after an assessment if its responsibility is demonstrated; the scrapped parts shall be the property of CARLY. For countries outside of the European Union, CARLY reserves the right to return the equipment by boat, and takes responsibility for the freight to the port which best suits the Customer. The cost of land transport from the port to the domicile of the Customer shall be its responsibility.

11.3 In case of default observed during the period of guarantee, it is the responsibility of the Customer to notify CARLY within a period of TWENTY-FOUR (24) hours (otherwise the guarantee will not be able to be applied), and to return the equipment under similar conditions to those of the first shipment, carriage and insurance paid. Proof of said defect is always incumbent upon the Customer. The charges for assembly and disassembly may not be claimed from CARLY. Any returned equipment will obligatorily have to be accompanied by a file which includes the invoice, the conditions of use and the defect observed.

11.4 Our distributors benefit from the manufacturer's guarantee to the limits stated in their own terms and conditions of sale.

• ARTICLE 12 - SECONDARY DAMAGES / LIABILITY

12.1 CARLY is not responsible for expenses incurred by the Customer at the time of intervention on the Products such as, notably, labour charges, movement, loss of liquid refrigerant, transport, etc. At any rate and even in the event the Product guarantee specified in article 11 applies, CARLY' liability shall not be involved other than for damages caused to people and property, excluding any trading loss, loss of stored equipment or other losses. The liability of CARLY is strictly limited, all causes combined, to the supply of the replacement Product; said replacement not suspending the initial guarantee and not under any circumstances prolonging its duration. CARLY is only bound towards its Customer, an informed professional, by an obligation of means, not of results. The Customer agrees to render the contractual limits of liability defined in the present CGV as enforceable against its insurers, its own Customer and their insurers.

12.2 The Products bought in continuation of the use of the selection assistance software available on CARLY website or CD, benefit from the guarantee aimed under article 11. Nevertheless, the use of the data and the results provided by the software is done under the full, whole and exclusive responsibility of the buyer. It is for the Customer to verify the relevance and accuracy of results and data suggested by the software compared to the installation and the desired use. In particular, company CARLY cannot be held responsible for the consequences (whatever they are) of using the software or of an error of choice in the software use.

• ARTICLE 13 - RETURN OF PRODUCT

Any return must be approved beforehand in writing by CARLY. Any Product whose return has been accepted will be sent to CARLY under similar conditions to those of the initial shipment, carriage and insurance paid by the Customer. No return may call into question the various payment due dates, even in case of return with involvement of the guarantee, with any payment default being deemed as termination of said guarantee. If equipment is taken back, a reduction of a minimum of THIRTY (30) % shall be taken from the initial purchase price, subject to the returned material being in perfect condition, excluding repackaging charges.

The possibility of the return of merchandise does not involve specially manufactured items (not in the catalogue).

• ARTICLE 14 - ASSIGNMENT OF JURISDICTION / CORRESPONDENCE

The present CGV are drafted in the French language, which is the only applicable version in case of a dispute. They are subject to French law.

Any dispute relative to the interpretation, execution or termination of the contract of sale established between the Customer and CARLY is subject to French law. The invalidity of one of the present provisions shall not result in the invalidity of the other provisions. In the absence of an amicable agreement, the dispute shall be brought before the Commerce Court of LYON.

All correspondence must be sent to the company headquarters of CARLY:

- By postal mail to: CARLY S.A.S - ZI de Braille - 69380 LISSIEU - FRANCE.

- By fax to: +33 (0)4.78.47.36.98

- By email to: info@carly-sa.com.