



Anti-acid filter driers

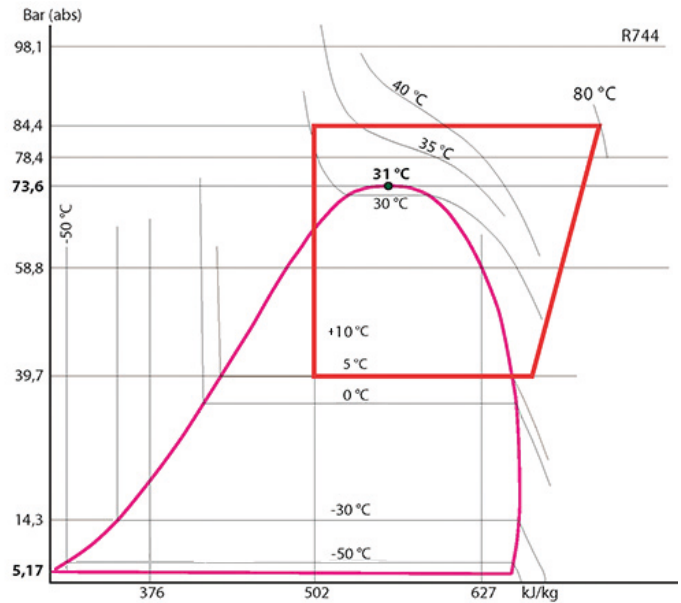
→ DCY-P14 / 140 bar (2030 psig)

■ 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 2014/68/EU.
- Product classification in CE categories is done with the PED 2014/68/EU 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.



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■ 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

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

components, 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 FILTRY-P9 (90 bar) ; 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 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 (Except in the case of highly additive oils). It is your responsibility to verify that the oil used is compatible with activated alumina.
- Filter drier efficiency and refrigerant moisture content should be checked using 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.



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■ Special precautions for components used with CO₂ in subcritical 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 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.



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■ Selection table

CARLY references	Connections	CARLY references	Connections	Dehydratable refrigerant capacity kg of refrigerant
	To solder ODF		To solder ODF	
	inch		mm	
				R744
				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.



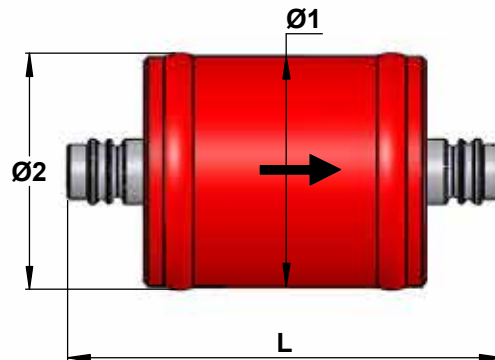
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■ Technical features

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	Art4§3
DCY-P14 163 S/MMS	0,27	140	15	100	-40	-30	Art4§3
DCY-P14 164 S/MMS	0,27	140	15	100	-40	-30	Art4§3
DCY-P14 165 S/MMS	0,27	140	15	100	-40	-30	Art4§3
DCY-P14 304 S/MMS	0,51	140	15	100	-40	-30	Art4§3
DCY-P14 305 S/MMS	0,51	140	15	100	-40	-30	Art4§3
DCY-P14 415 S/MMS	0,84	140	15	100	-40	-30	Art4§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 2014/68/EU (refer to Chapter 0 of CARLY technical catalogue).



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■ 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