

Technical brochure

# Filter drier type DCLE

Hydrocarbons



Introduction

**Eliminator®** liquid line filter driers protect refrigeration and air-conditioning systems from moisture, acids, and solid particles. With these contaminants eliminated, systems are safer from harmful chemical reactions and from abrasive impurities.

All **Eliminator®** driers have a solid core with binding material held to an absolute minimum. Core selection is primarily based on the refrigerant oil used in the system.

**Eliminator®** type DCLE, with a solid core of 80% molecular sieves and 20% activated alumina, is the drier of choice for systems with HC refrigerants (R 290, R 600, R 600a and R 1270) and mineral or alkyl benzene oils. Type DCLE driers are particularly suited for systems that operate at high condensing temperatures and require high drying capacity.



Features

The Core

Type DCLE

- 80% 3Å molecular sieves with 20% activated alumina.
- Perfect core blend for systems that operate at high condensing temperatures and require high drying capacity.
- Optimized for HC refrigerants (R 290, R 600, R 600a, R 1270) with mineral or alkyl benzene oils.

The Shell

- UL approved for MWP up to 42 bar.
- Available with solder (copper plated steel) connectors
- Compact 3 in<sup>3</sup>. drier ideal for refrigeration and air conditioning units.
- Corrosion resistant powder-painted finish. Can be used in all environments including marine applications.
- Allows installation with any orientation provided the arrow is in the flow direction.
- Available in sizes from 3 to 75 cubic inches

The Filter

- 25 µm filter provides high retention with minimal pressure drop.
- Thermally stable up to 120°C.

Approvals

CŞUS UL file no. SA 6398  
PED 97/23/EC - a3p3

**Technical data**
**Surface and volume**

Filter	Solid core surface [cm <sup>2</sup> ]	Solid core volume [cm <sup>3</sup> ]	Filter drier volume [l]	DCLE acid capacity [g]
DCLE 03	65	41	0.08	0.58
DCLE 05	75	65	0.12	0.87
DCLE 08	110	100	0.17	1.36
DCLE 16	175	225	0.38	3.12
DCLE 30	330	480	0.67	6.40
DCLE 60	660	960	1.34	12.80
DCLE 75	800	1300	1.75	17.80

**Temperature range**

– 40 to 70°C

**Technical data and capacities**
**DCLE**
**R 290, R 600, R 600a, R 1270**

Drying and liquid capacity - Type DCLE

Type	Drying Capacity [kg refrigerant] <sup>1)</sup>								Liquid Capacity (kW)				Max. Working pressure PB [bar]
	R 290		R 600		R 600a		R 1270		R 290	R 600	R 600a	R 1270	
	24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C					
DCLE 032s	6	6	10	8	10	8	4	4	8	9	8	9	42
DCLE 053s	10	9	16	13	15	13	7	6	24	26	23	25	42
DCLE 083s	17	14	25	21	24	21	11	10	24	26	23	25	42
DCLE 084s	17	14	25	21	24	21	11	10	34	37	33	35	
DCLE 163s	36	31	54	45	54	45	24	21	27	30	26	28	42
DCLE 164s	36	31	54	45	54	45	24	21	37	41	36	39	
DCLE 165s	36	31	54	45	54	45	24	21	50	56	50	53	
DCLE 304s	77	66	115	96	113	95	51	45	37	41	36	39	42
DCLE 305s	77	66	115	96	113	95	51	45	55	61	54	58	42
DCLE 307s	77	66	115	96	113	95	51	45	76	84	74	79	35
DCLE 607s	153	132	229	192	226	190	103	90	91	100	89	95	35
DCLE 757s	212	193	318	267	314	264	143	125	101	112	99	105	35

1) Drying capacity is based on following moisture content test standards before and after drying:

- R 290: From 800 ppm W to 30 ppm W
- R 600: From 565 ppm W to 20 ppm W
- R 600a: From 565 ppm W to 20 ppm W
- R 1270: From 1020 ppm W to 30 ppm W

Flammable / toxic refrigerants  
R 290, R 600, R 600a and R 1270

Terms of delivery

It should be noted that special terms of delivery apply to Danfoss controls for HC and corresponding flammable refrigerants: Please refer to Danfoss literature RZ0ZM (agreement on the application of HC refrigerants). All inquiries for DCLE for HC will be dealt with as "inquiries for special versions". Delivery agreements on components can only be entered into within the EU or EFTA, and

the export and re-export of plants or sections of plants containing Danfoss components are also limited to the EU and EFTA.

Product technology

The use of Danfoss DCLE for R 290, R 600, R 600a and R 1270 in refrigeration plants is subject to explosion protection regulations for danger zone 2 (only rare or short term threat). The Danfoss controls are, therefore, devel-

oped for this above-mentioned requirement.



DCLE complies with the requirements for explosive atmospheres (94/9/EC) ac. ATEX zone 2.

DCLE complies with the requirements in the Pressure Equipment Directive (97/23/EC) (PED) fluid group I (flammable/toxic media).

DCLE is marked with a label that indicates fire hazard (B.3.2 / ISO 3864).

Only Danfoss valves and controls released for use with flammable hydrocarbons must be used with these substances. The actual medium must be stated in the product data sheet and / or on the product.

Only original Danfoss spare parts approved for use with flammable hydrocarbons must be used.

Technical safety requirements

The refrigeration system must be located within the EU or EFTA and comply with the existing EU legislation, such as the Pressure Equipment Directive (PED) (97/23/EC), the directive concerning potential explosive atmospheres (ATEX) (94/9/EC), EN 378 and other relevant EU legislation.

The refrigeration system must always comply with any local directive, legislation and any other regulation applying in the area of installation.

Installation and maintenance

Only authorized persons, who are certified in installing and maintaining refrigeration plants containing flammable hydrocarbons, may do the installation and maintenance.

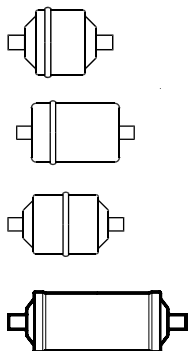
All requirements from local authorities, regarding use of hydrocarbons in refrigeration systems, must be fulfilled.

The refrigeration system must be designed in such a way that no abnormal impact (e.g. abnormal vibration, liquid hammer, or pressure pulsations) can create risk for damage of the refrigeration system during operation. Only original Danfoss spare parts approved

for use with flammable hydrocarbons may be used.

The Danfoss products are classified according to the ATEX directive. Danfoss takes no responsibility for the classification of the refrigeration system.

Ordering



Solder

**DCLE**

Type	Conn. in.	Code no.	Conn. mm	Code no.
DCLE 032s	1/4	023Zxxxx	6	023Zxxxx
DCLE 053s	3/8	023Zxxxx	10	023Zxxxx
DCLE 083s	3/8	023Zxxxx	10	023Zxxxx
DCLE 084s	1/2	023Zxxxx	12	023Zxxxx
DCLE 163s	3/8	023Zxxxx	10	023Zxxxx
DCLE 164s	1/2	023Zxxxx	12	023Zxxxx
DCLE 165s	3/8	023Zxxxx	16	023Zxxxx
DCLE 304s	1/2	023Zxxxx	12	023Zxxxx
DCLE 305s	3/8	023Zxxxx	16	023Zxxxx
DCLE 307s	3/8	023Zxxxx	22	023Zxxxx
DCLE 607s	3/8	023Zxxxx	22	023Zxxxx
DCLE 757s	3/8	023Zxxxx	22	023Zxxxx

Selection example

Select the drier based on the adsorption and liquid capacity required.

**c. Result**

A DCLE 163s can be used.

**a. Amount of charge:** 25 kg R 290 at  $t_l = 24^\circ\text{C}$

If the initial moisture content is very small or a planned change of the filter drier is considered, a smaller filter drier size can be chosen.

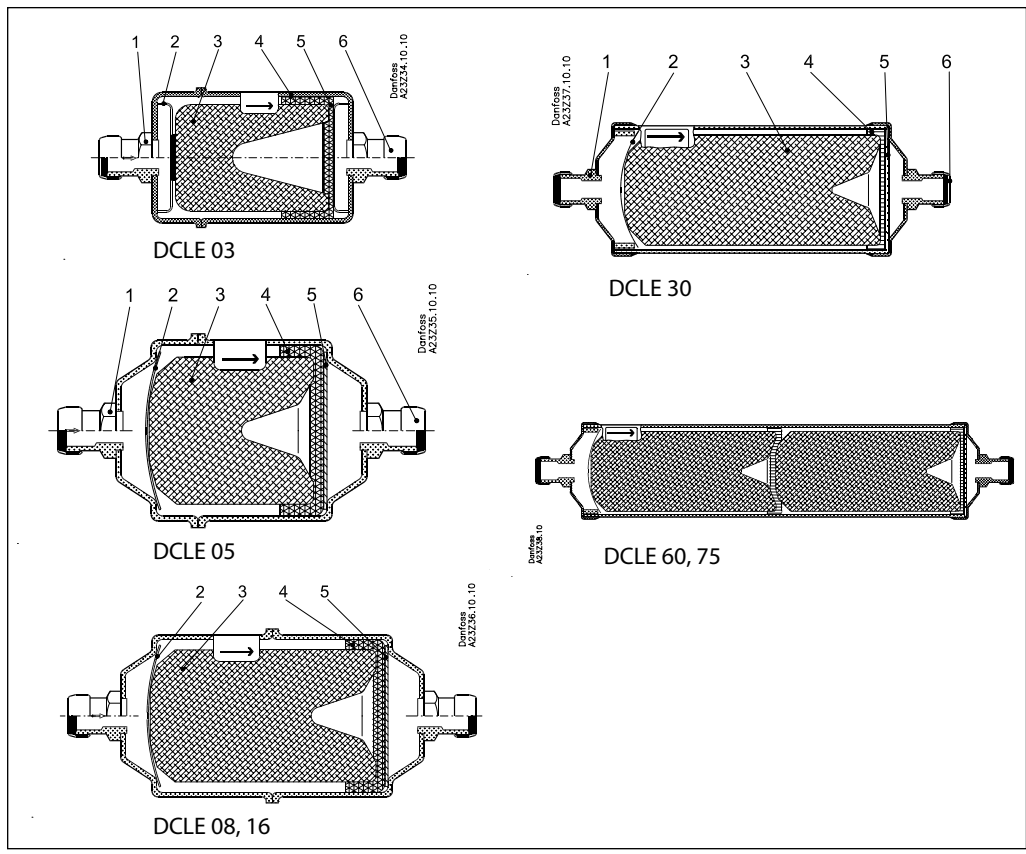
**b. Cooling capacity:**  $Q_c = 20 \text{ kW}$   
 To obtain a mass flow corresponding to 20 kW cooling capacity with a DCLE 16 filter drier, a 3/8 inch connection must be chosen. Larger connections can be chosen in accordance with the liquid line dimension.

Type	Drying Capacity [kg refrigerant] <sup>1)</sup>								Liquid Capacity (kW)				Max. Working pressure PB [bar]
	R 290		R 600		R 600a		R 1270		R 290	R 600	R 600a	R 1270	
	24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C					
DCLE 032s	6	6	10	8	10	8	4	4	8	9	9	9	42



DCLE 084s	17	14	25	20	25	20	10	10	17	17	17	17	42
DCLE 163s	36	31	54	45	54	45	24	21	27	30	26	28	42
DCLE 164s	36	31	54	45	54	45	24	21	37	41	36	39	42
DCLE 165s	36	31	54	45	54	45	24	21	50	56	50	53	42

Design and function



- 1. Inlet
- 2. Spring
- 3. Solid core
- 4. Polyester mat
- 5. Perforated plate
- 6. Capsule, solder connection

The relatively large diameter of the filter drier means that the liquid flow velocity is suitably low and the pressure drop minimal.

Powder formation is eliminated because the solid core grains are bonded and cannot move against each other.

**Dimensions and weights**

	Type	A mm	A <sub>1</sub> mm	A <sub>2</sub> mm	B mm	L mm	D <sub>1</sub> mm	D <sub>2</sub> mm	Weight kg
	DCLE 053s	75	24.5	50.5	81.4	113	58	54	0.39
	DCLE 083s DCLE 084s	101 101	50.5 50.5	50.5 50.5	107.4 109.0	139 143	58 58	54 54	0.40 0.42
	DCLE 163s DCLE 164s DCLE 165s	110 110 110	55 55 55	55 55 55	116.4 118.0 118.0	148 152 160	80 80 80	76 76 76	0.79 0.81 0.82
	DCLE 304s DCLE 305s DCLE 307s	186 186 186	- - -	- - -	194.0 194.0 196.0	228 236 246	80 80 80	76 76 76	1.31 1.32 1.35
	DCLE 607s DCLE 757s	337 338	- -	- -	347.0 348.0	397 400	80 93	76 89	2.39 3.38

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