Directional Control Valve type VDH 2EC 4/3

For Cetop 2 flange mounting (ISO 4401)

Applications

Directional valves used to control the direction of water flow.

The valves are designed for tap water, ie water without additives. (EU-Directive 98/83/EC).

Function

The directional control valve is a direct operated On/Off solenoid valve electrically activated by 4 coils. The valve is designed according to the flat face principle with an armature on an orifice face. Each individual solenoid is controlled by its individual coil; this design offers many different valve configurations to the end user.

Advantages

- Installable on all Cetop 2 flanges
- Corrosion resistant surfaces
- Easy-to-clean surfaces
- The seat valve design ensures minimum leakage
- High degree of enclosure, IP67
- Many valve configurations available

Variants

The valve housing comes in standard version in stainless steel AISI 304 (W. No. 1.4301)
The valve is available as a Normally Closed valve (NC).

Filtration

The supplied water must be filtered through a 10 µm abs., β_{10}-value > 5000 filter.
For further filter details, please contact the Danfoss High-Pressure Pumps Sales Organization.

Technical data

Max. pressure port P, A and B *)	210 bar
Return pressure, port T (T ≤ A, B pressure) *)	max 25 bar
Min. inlet pressure	> 0 bar
Max flow	2 l/min
Min. flow	> 0 l/min
Pressure loss	See graph page 3
Opening time P → A/B (2 l/min @ 140 bar) ** typical value	150 ms
Closing time A/B → N (2 l/min @ 140 bar) ** typical value	100 ms
Leakage, port P → A, B, T	0 ml/min
Leakage, port A, B → T	0 ml/min
Leakage, port, A, B → P (inlet pressure port P < pressure port A, B) ***	open
Leakage, port A, B → P (inlet pressure port P > pressure port A, B)	0 ml/min
Degree of enclosure	IP 67

*) The pressure in each of the ports P, A and B must always be higher than the pressure in port T
**) No electrical delay required when changing direction
***) Note the valve has no check valve in the P-port. Thus a leakage will occur form A/B → P in case the inlet pressure port P< presure port A,B . This means when controlling a cylinder it is recommended to build in an inline check valve.

Temperature

Storage temperature:
- -40°C to +70°C – provided that the valve is drained of fluid and stored "plugged"

Operation on (clean) water:
- Fluid temperature and ambient temperature: +3°C to +50°C

Operation on water containing antifreeze:
- Fluid temperature and ambient temperature: -30°C 1) to +50°C

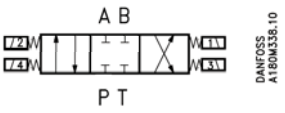
1) please see paragraph on antifreeze protection

Antifreeze Protection

If a system requires antifreeze protection, Danfoss recommends Dowcall N or Chillsafe mono propylene glycol from the Dow Chemical Company and Arco Chemical Company, respectively. Both antifreezes are biologically degradable and must be used together with *demineralized* water.

Mixing ratio must be:
- min. 30% antifreeze and 70% demineralized water providing frost protection to –13°C and preventing biofilm in the system.
- max. 50% antifreeze and 50% demineralized water due to increased viscosity providing frost protection to –30°C.

Code numbers

Valves (without coils)	Function symbol	Weight kg	Code number
VDH 2 EC - NC stainless steel, AISI 304		2.9 kg	180L0294
Activation of valve	Electrical: 12 V d.c., 24 V d.c., 24 V a.c., 110 V a.c. , 240 V a.c. Power consumption: 18 W (d.c.), 10 W (a.c.) per coil Manual with permanent magnet		

The valve is supplied with screws and O-rings, but without coils

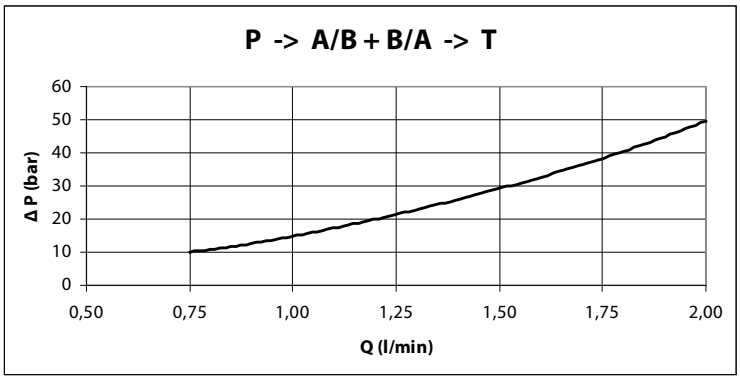
Code numbers (continued)

Coil	Coils (clip-on) (NC + NO)
24 V / 50 Hz /10 W	018F7920
220 V / 50 Hz /10 W	018F7921
240 V / 50 Hz /10 W	018F7924
24 V / 60 Hz /10 W	018F7922
220 V / 60 Hz /10 W	018F7925
240 V / 60 Hz /10 W	018F7926
110 V / 50/60 Hz /10 W	018F7923
12 V d.c. / 18 W	018F7913
24 V d.c. / 18 W	018F7914

For other voltages, please contact Danfoss High-Pressure Pumps Sales Organization.

ATEX-version: Please consult the document "Solenoid valves intended for use in ATEX classified areas" 521B1101

Pressure losses at different flows



Available valve configurations

The table below shows the possible valve configurations, depending on which coils are activated.

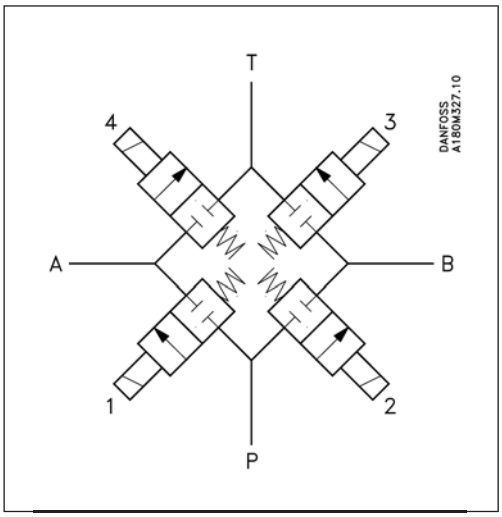
For VDH 2EC 4/3 NC

Function	1	2	3	4
A B P T	off	off	off	off
A B P T	off	on	off	on
A B P T	on	off	on	off
A B P T	off	off	on	off
A B P T	on	off	off	off
A B P T	off	off	off	on
A B P T	off	on	off	off
A B P T	off	off	on	on
A B P T	on	on	off	off
A B P T	off	on	on	off
A B P T	on	off	off	on
A B P T	on	on	on	on

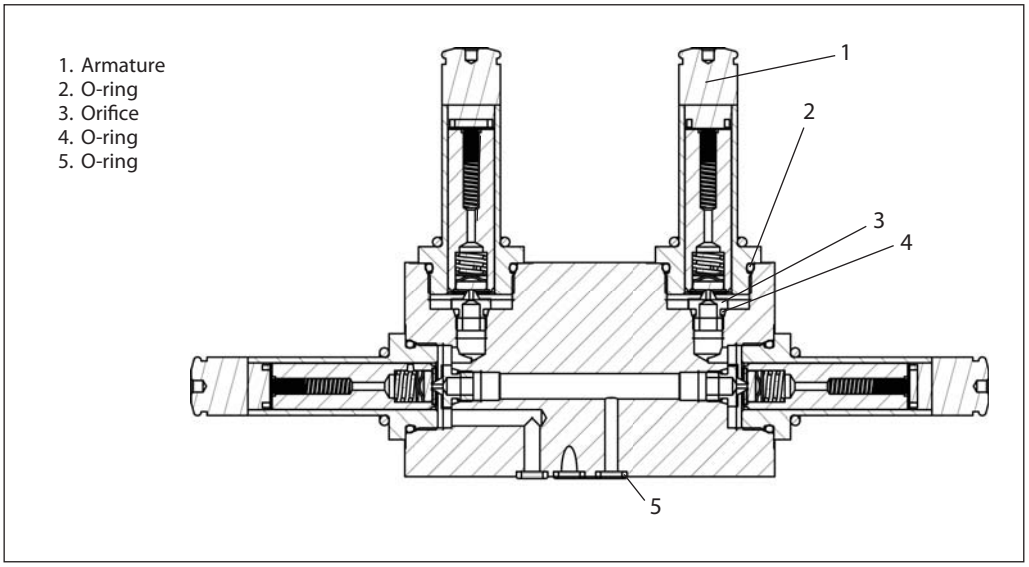
Danfoss A180M326.10

Diagram showing flow routes through the valve, port lettering and coil numbers.

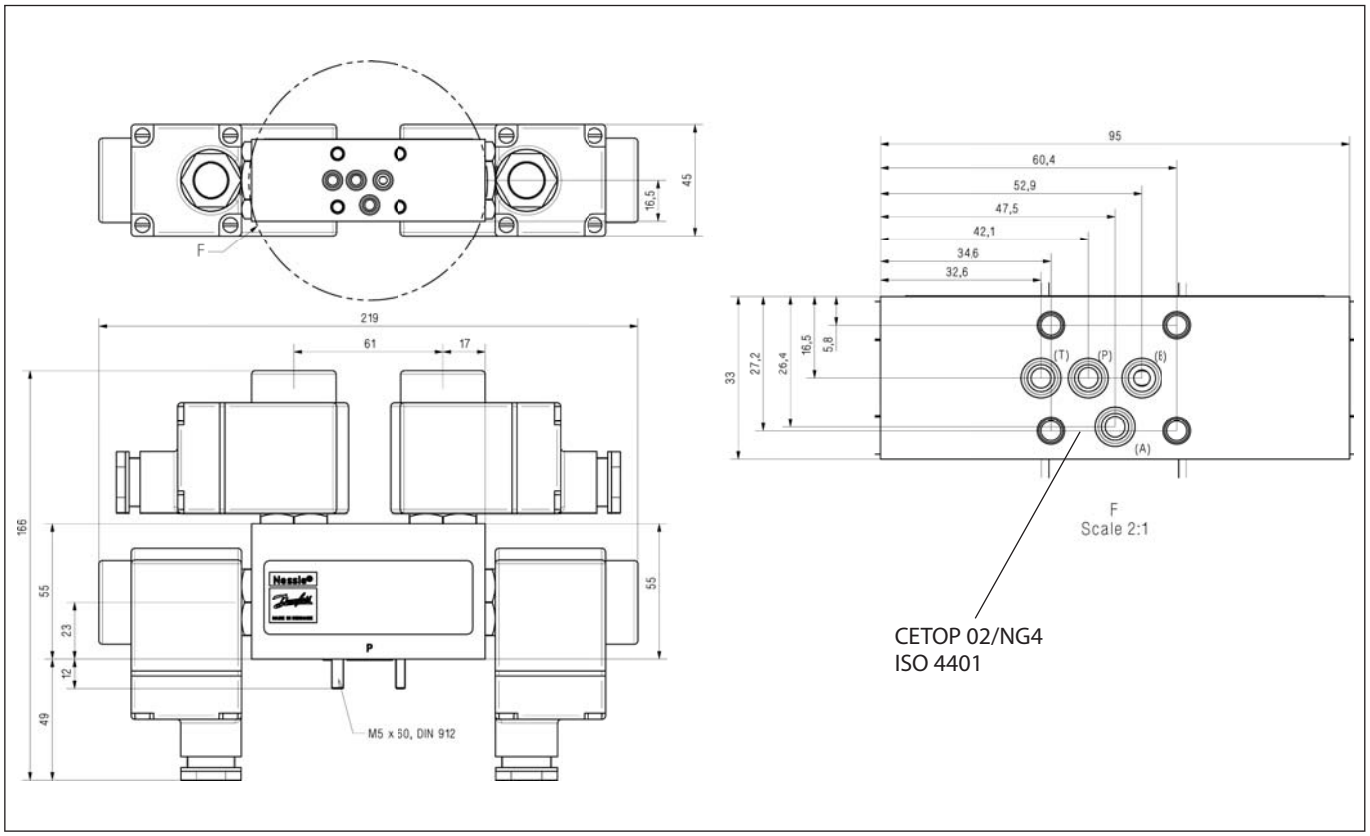
For VDH 2EC 4/3 NC



Cross-section of valve



Dimensions (mm)
VDH 2EC 4/3



Code numbers

Spare parts		Code number
Armature kit, NC (pos. 1 + pos. 2)	High Pressure	180L5011
Orifice kit (pos. 3 + pos. 4)		180Z0098

O-ring for mounting on block	Dimensions	Code number
NBR, 1 pc. (pos. 5)	4.47 × 1.78	633B1306

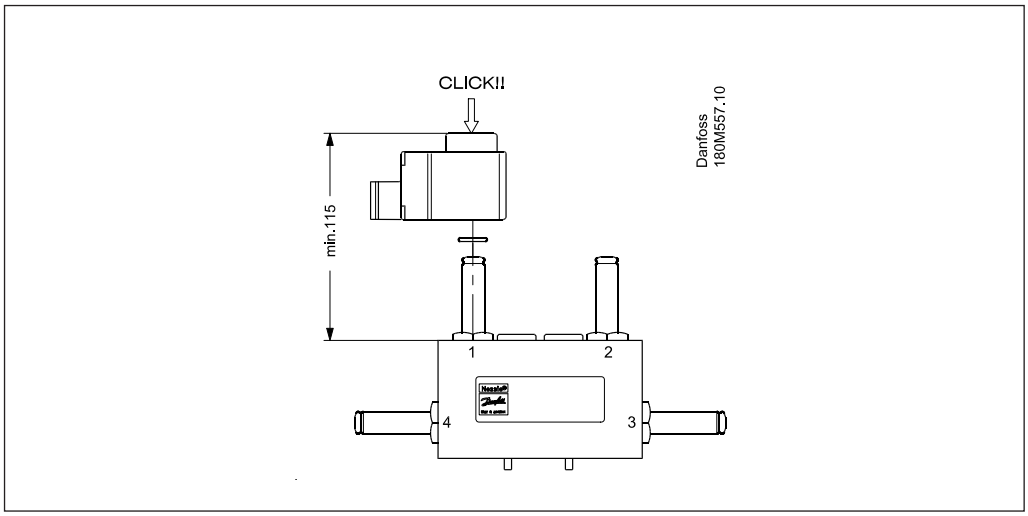
Assembly screw	Tightening torque	Code number
M5 × 60 ISO 4762 A4, 1 pc	7 Nm	681X0659
Tools	**Application**	**Code number**
Special tool for orifice insert	Mounting/dismounting of orifice Orifice insert in valve housing: 12 Nm ±2 Nm Armature to be screwed into the valve housing: 60 Nm ±2 Nm	180Z0034
Permanent magnet	For manual activation of valve	180Z0212

For further details on coils, please see 521B0980.

Mounting of valve on cetop block

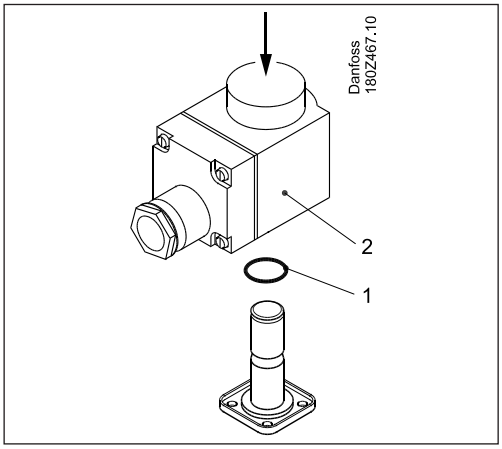
The valve is designed to be mounted on a block with CETOP 2-port connection. Four stainless steel screws and four O-rings are supplied with the valve for mounting. Remember to smear/spray the threads on the screws with Molykote® D pasta from Dow Corning, or Klüber UH1 84-201 from Klüber lubrication, before mounting the valve.

Mounting of coils on valve

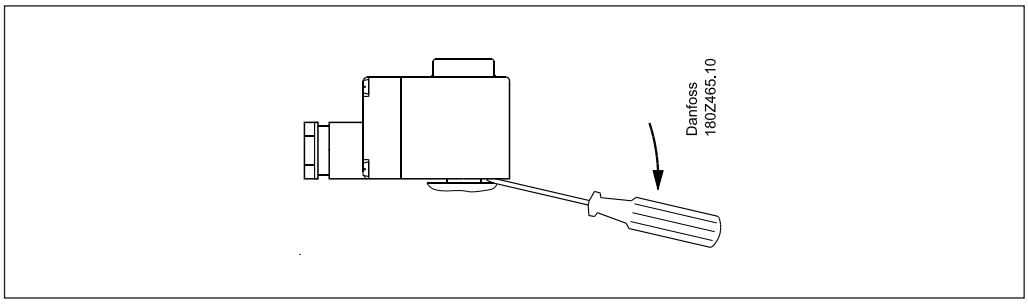


Coil on valves with short armature tubes (NC and NO valves)

1. Place the O-ring on the armature tube.
2. The coil is clicked on by means of a light pressure by hand – without using tools.



Dismounting



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