ENGINEERING
TOMORROW

Data sheet

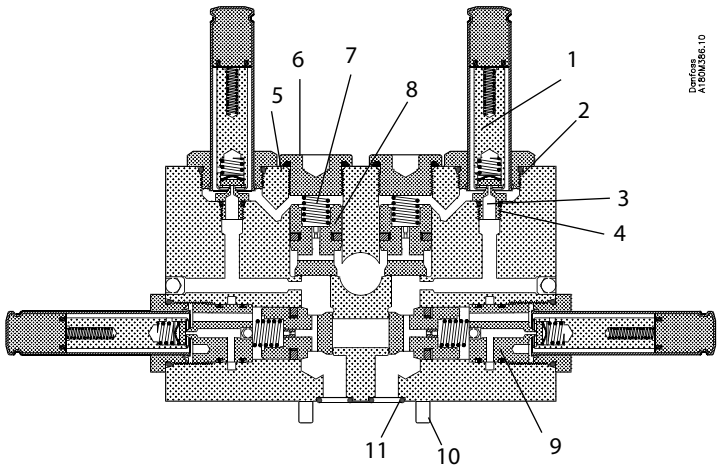
# Directional control valve

## VDH 30EC 4/3
## For Cetop 3 flange mounting (ISO 4401) and inline mounting

**Introduction**

The VDH 30 EC is designed for controlling the direction of water flow.
The valves are designed for tap water, i.e. without additives (EU-Directive 98/83/EC).

1. Armature
2. O-ring
3. Orifice
4. O-ring
5. O-ring
6. Plug
7. Spring
8. Poppet
9. Orifice insert
10. Screw
11. O-ring




**Function**

The directional valves are pilot operated On/Off seat valves electrically activated by 4 coils.
The valves are designed according to the seat valve principle where each individual seat valve is controlled by its own pilot stage.

This valve type contains 4 seat valves altogether: two inlet valves and two outlet valves. As each seat valve is individually controlled by its own pilot, this design offers many different valve configurations to the end user.

**Features**

- Installable on all Cetop 3 blocks and inline blocks
- Corrosion resistant surfaces
- Easy-to-clean surfaces
- The seat valve design ensures minimum leakage
- High degree of enclosure, IP67
- Many valve configurations available

**Versions**

The valve housing comes in standard version in stainless steel AISI 304 (W. No. 1.4301) or ISI 316 (W. No. 1.4401)

The valve is available as a Normally Close valve (NC) or in a combination of Normally Open (NO) and Normally Closed (NC

**Temperature**

*Storage temperature:*
- -40°C to +70°C [ -40 to 158 °F] – 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 [37 to 122 °F]

*Operation on water containing antifreeze:*
- Fluid temperature and ambient temperature: -30°C 1) to +50°C [-22 to 122 °F]

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.

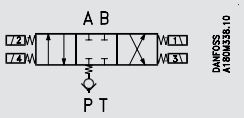
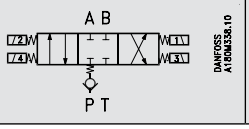
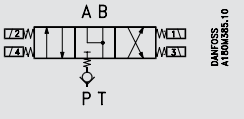
Mixing ratio must be:
- min. 30% antifreeze and 70% demineralized water providing frost protection to –13°C [9 °F] and preventing biofilm in the system.
- max. 50% antifreeze and 50% demineralized water due to increased viscosity, providing frost protection to –30°C [-22 °].

**Filtration**

The water supply must be filtered through a 10 µm abs., $\beta_{10}$-value > 5000 filter.

For further filter details, please contact the Danfoss Sales Organization.

**Technical data and Code numbers**

| Valve body | VDH 30EC - NC Stainless steel, AISI 304 | VDH 30EC - NC Stainless steel, AISI 316 | VDH 30 EC 2xNC + 2x NO Stainless steel, AISI 3040 |
|---|---|---|---|
| Code number | 180L0046 | 180L0047 | 180L0050 |
| Function symbol |  |  |  |
| Max. pressure port P, A and B [1] | 140 barg [2030 psig] | | |
| Return pressure, port T (T ≤ A, B pressure [1] | 140 barg [2030 psig] | | |
| Min. inlet pressure | 5 barg [72.5 psig] | | |
| Max. flow | 30 l/min [8 gpm] | | |
| Min. flow | 1 l/min [0.2 gpm] | | |
| Pressure loss | See curve page 4 | | |
| Leakage, port P → A, B, T | 0 ml/min [ 0 gpm] | | |
| Leakage, port A, B → T | 0 ml/min [ 0 gpm] | | |
| Leakage, port A, B → P (inlet pressure port P = 0 barg) | max. 5 ml/min [ max. 0.0013 gpm] | | |
| Leakage, port A, B → P (inlet pressure port P = pressure port A,B) | 0 ml/min [0 gpm] | | |
| Opening time when changing direction [2] | 110 ms | | |
| Closing time when changing direction [2] | 130 ms | | |
| Weight | 3.8 kg [ 8 lbs] | | |

The valves are supplied with screw and O-rings, but without coils.

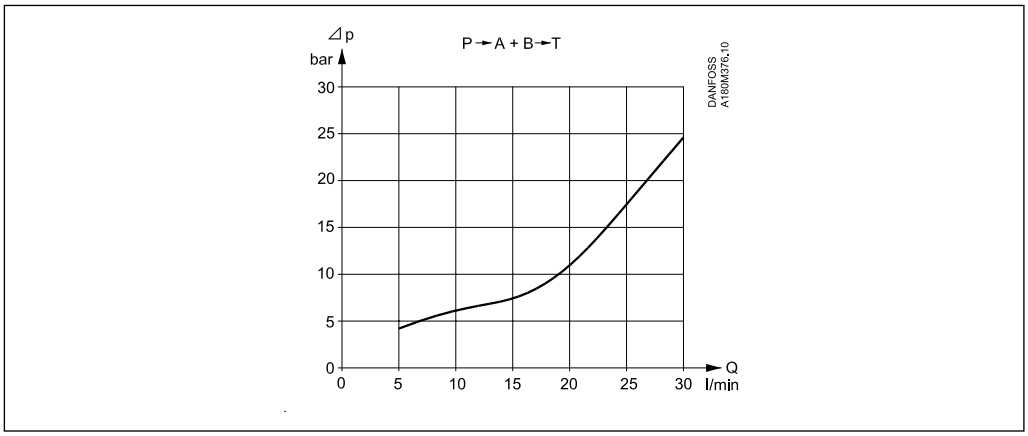
| Coils type BE / Without LED / incl. Terminal box | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Description | Code no. | Voltage | Power | Voltage tolerance | T max Ambient °C [°F] | Connection | Enclosure | Weight kg [lbs] |
| Coil 240V-60Hz-IP67 | 018F7926 | 240V 60Hz | 15W | ± 10-15% | 80 [176] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 240V-50Hz-IP67 | 018F7924 | 240V 50Hz | 11W | | 80 [176] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 220-230V-50Hz-IP67 | 018F7921 | 220-230 V 50 Hz | 12W | | 80 [176] | Terminal box | IP67 | 0.3 (0.7) |
| Coil 220-230V-50-60Hz-IP67 | 018F7919 | 220-230 V 50-60Hz | 17W 14W | | 50 [122] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 220V-60Hz-IP67 | 018F7925 | 220V 60Hz | 13W | | 80 [176] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 200V-50-60Hz-IP67 | 018F7929 | 200V 50/60Hz | 10W | | 80 [176] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 110V-50-60Hz-IP67 | 018F7923 | 110V 50-60Hz | 15W 13W | | 50 [122] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 24V-60Hz-IP67 | 018F7922 | 24V 60Hz | 14W | | 80 [176] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 24V-50Hz-IP67 | 018F7920 | 24V 50Hz | 12W | | 80 [176] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 42V-50Hz-IP67 | 018F7927 | 42V 50Hz | 10W | | 80 [176] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 24V-DC- IP67 | 018F7914 | 24V DC | 16W | ± 10% | 50 [122] | Terminal box | IP67 | 0.3 [0.7] |
| Coil 12V-DC- IP67 | 018F7913 | 12V DC | 15W | ± 10% | 50 [122] | Terminal box | IP67 | 0.3 [0.7] |

**Code numbers (continued)**

**Cetop 3 blocks**

| Description | Weight kg [lbs] | Code number |
|---|---|---|
| Inline block for 1 valve (P&T direct for VPH 15E) | 0.8 [1.7] | 180L0060 |
| Block for 1 valve | 2.4 [5.3] | 180L0081 |
| Block for 2 valves | 4.4 [9.7] | 180L0082 |
| Block for 3 valves | 7.3 [16.1] | 180L0083 |
| Block for 4 valves | 9.6 [21.2] | 180L0084 |
| Cover plate incl. screws and O-ring (for covering-up non-used valve outlets on block) | 0.1 [0.2] | 180L0079 |

**Pressure losses at different flows**



## Available valve configurations

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

*For VDH 30EC 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 |

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

*For VDH 30EC 4/3 NC + NO*

| Function | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | NC | NC | NO | NO |
| A B / P T | off | off | on | on |
| A B / P T | off | on | on | off |
| A B / P T | on | off | off | on |
| A B / P T | off | off | off | on |
| A B / P T | on | off | on | on |
| A B / P T | off | off | on | off |
| A B / P T | off | on | on | on |
| A B / P T | off | off | off | off |
| A B / P T | on | on | on | on |
| A B / P T | off | on | off | on |
| A B / P T | on | off | on | off |
| A B / P T | on | on | off | off |

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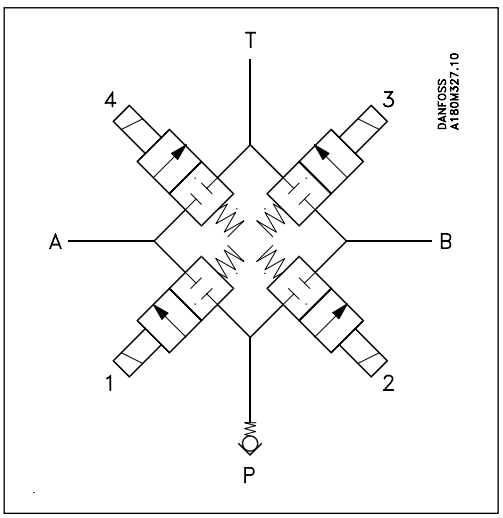
*For VDH 30EC 4/3 NC*

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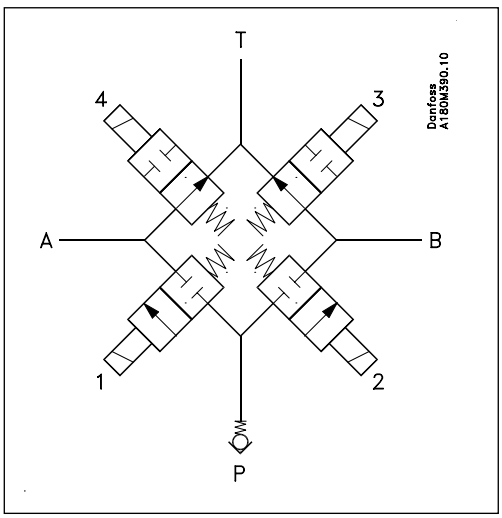
*For VDH 30EC 4/3 NC + NO*

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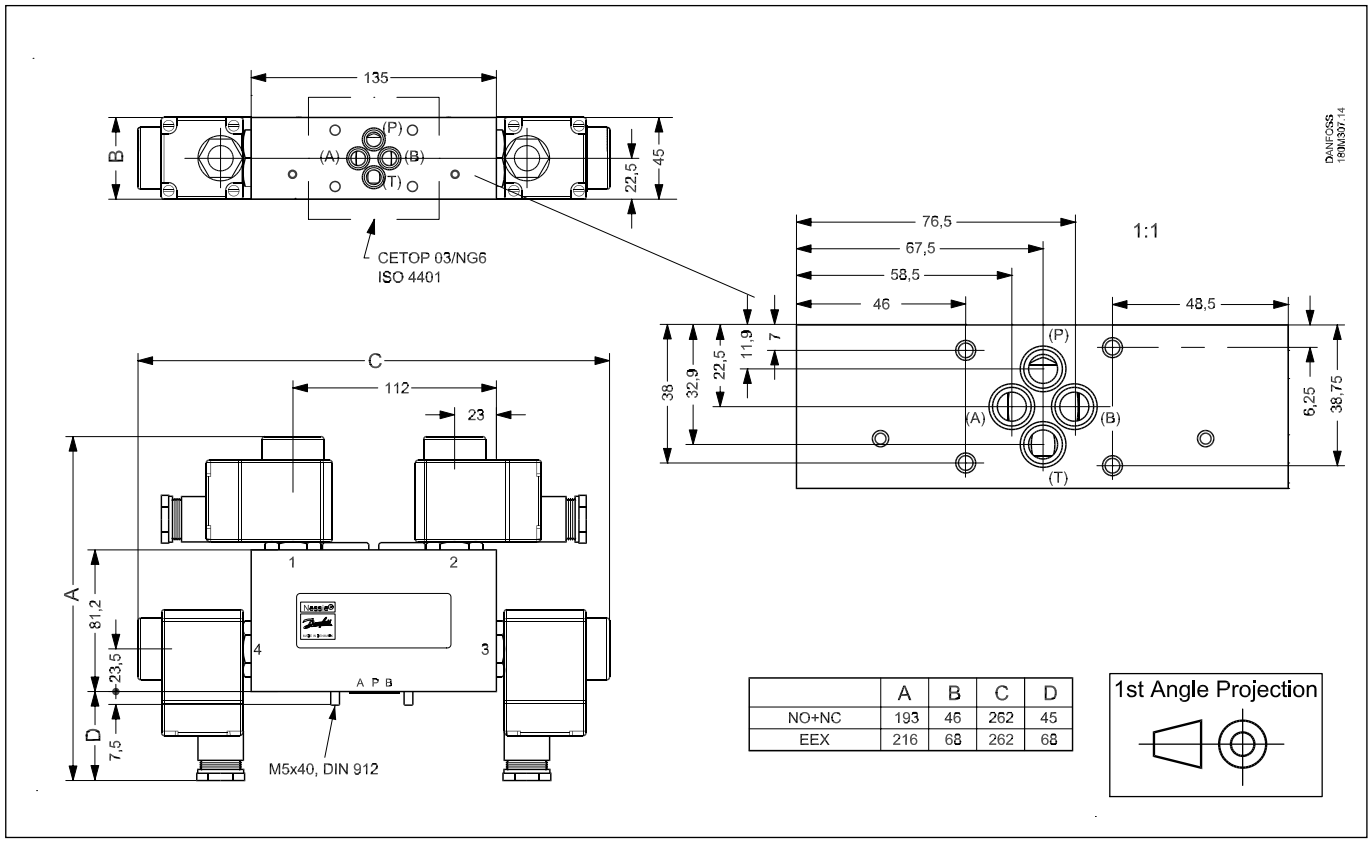
**Dimensions (mm)**
**VDH 30EC 4/3**

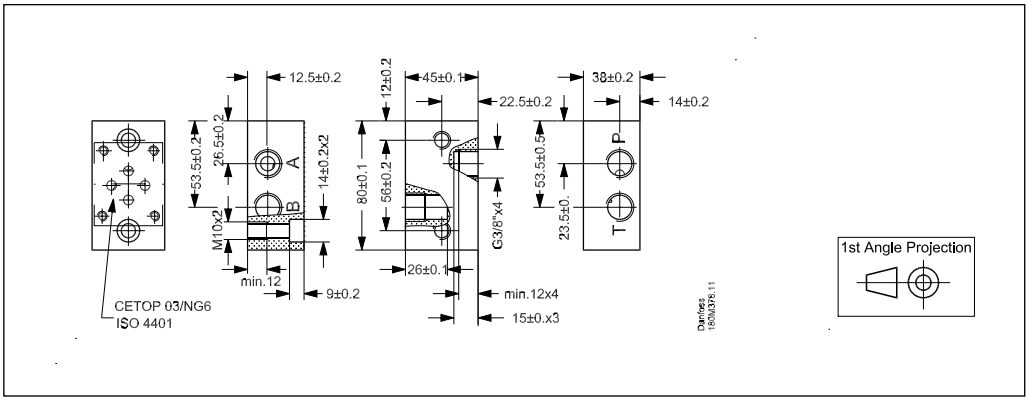



| | A | B | C | D |
|---|---|---|---|---|
| NO+NC | 193 | 46 | 262 | 45 |
| EEX | 216 | 68 | 262 | 68 |

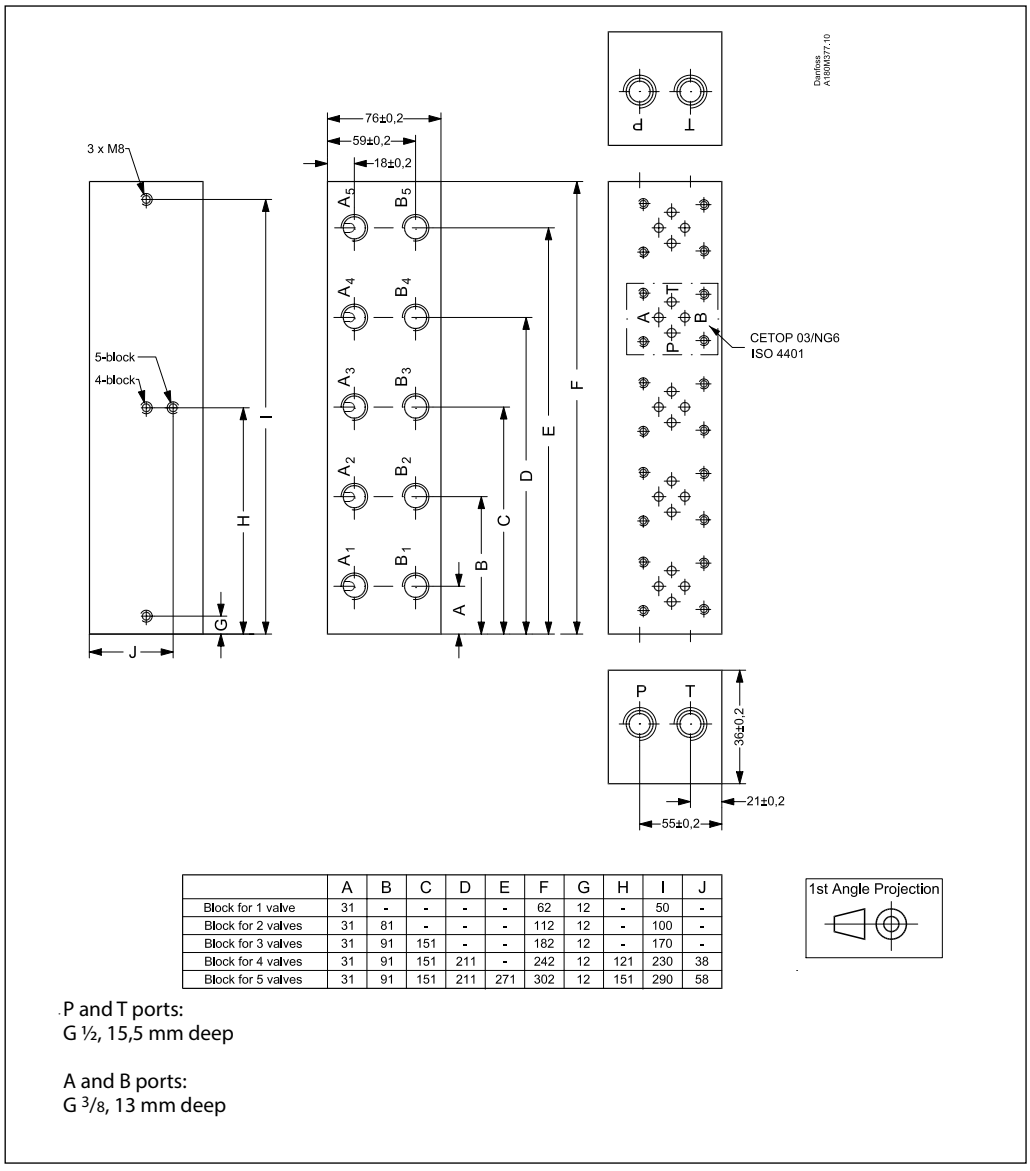
1st Angle Projection

**Dimensions (mm)**
**Inline block for 1 valve**

**180L0060**




**Dimensions (mm)**
**Cetop blocks**




| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| Block for 1 valve | 31 | - | - | - | - | 62 | 12 | - | 50 | - |
| Block for 2 valves | 31 | 81 | - | - | - | 112 | 12 | - | 100 | - |
| Block for 3 valves | 31 | 91 | 151 | - | - | 182 | 12 | - | 170 | - |
| Block for 4 valves | 31 | 91 | 151 | 211 | - | 242 | 12 | 121 | 230 | 38 |
| Block for 5 valves | 31 | 91 | 151 | 211 | 271 | 302 | 12 | 151 | 290 | 58 |

P and T ports:
G ½, 15,5 mm deep

A and B ports:
G 3/8, 13 mm deep

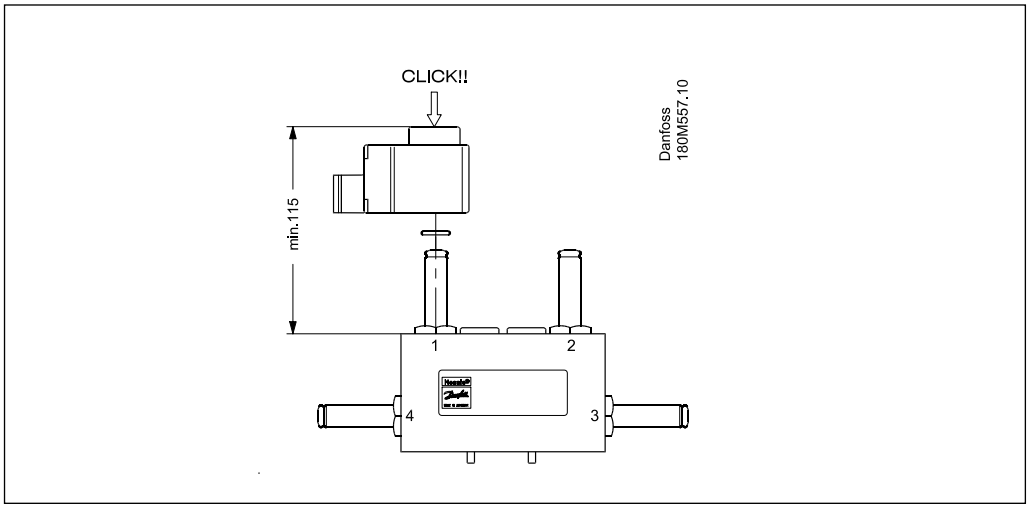
**Spare parts**
**Code numbers**

| Spare parts | | Code number |
|---|---|---|
| Poppet kit (pos. 8) | | 180L5005 |
| Armature kit, NC (pos. 1) | | 180L5002 |
| Armature kit, NO (pos. 1) | | 180L5010 |
| Orifice kit | | 180Z0099 + 180Z0098 |
| **O-ring for mounting on block** | **Dimensions** | **Code number** |
| NBR, 1 pc (pos. 11) | 9.25 x 1.78 | 633B1243 |
| **Assembly screw** | **Tightening torque** | **Code number** |
| M5 x 40 ISO 4762 A4, 1 pc (pos. 10) | 7 Nm | 681X0162 |
| **Tools** | **Application** | **Code number** |
| Special tool for orifice insert | Mounting/dismounting of orifice<br>Orifice inser in valve housing:<br>12 Nm ± 2 NM<br>Armature to be screwed into the valve housing:<br>60 Nm ± 2 Nm | 180Z0034 |
| Spool tool incl. in 180L5005 | Mounting of spool | |
| Permanent magnent | For mounting activation of valve | 180Z0212 |

**Mounting of v alve on Cetop block**

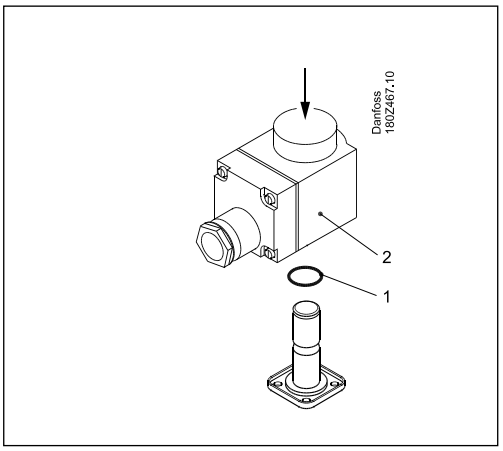
The valve is designed to be mounted on a block with CETOP 3-port connection. Four stainless steel screws and four O-rings are supplied with the valve for mounting. Remember to smear/ spray the threads on the screws with Molykote® D pasta from Dow Corning, or Klüber UH1 84-201 from Klüber lubrication, before mounting the valve.

## Mounting of coil

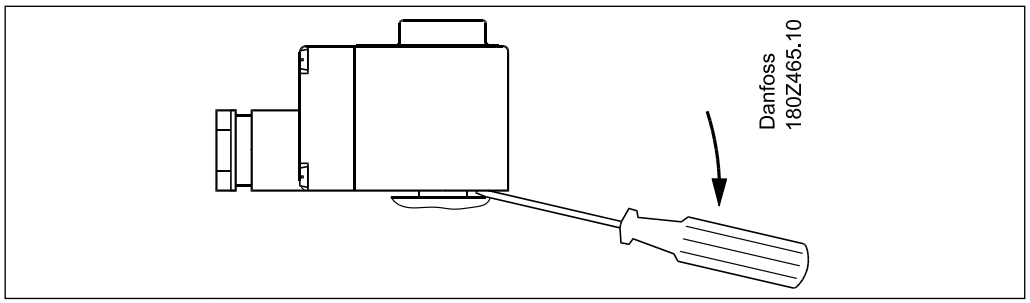



*Coil on valves with short armature tubes (NC and NO valves)*

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 of coil



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