

M*F3(M)

SHUT-OFF VALVES

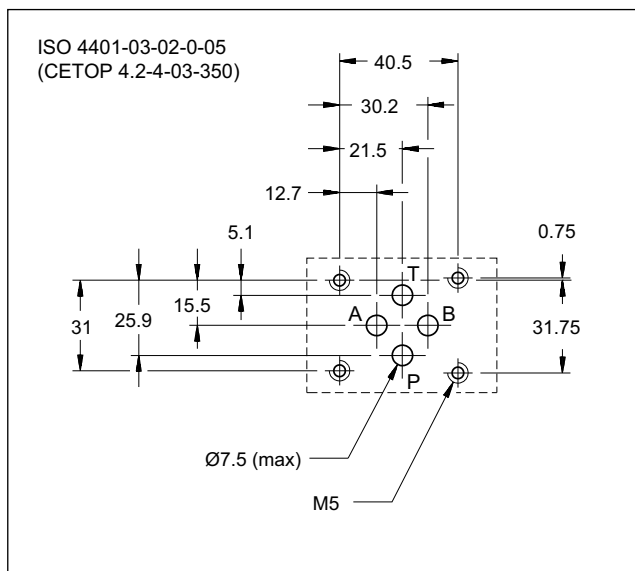
SOLENOID OR HYDRAULICALLY ACTUATED, WITH OR WITHOUT POSITION MONITORING

SERIES 10

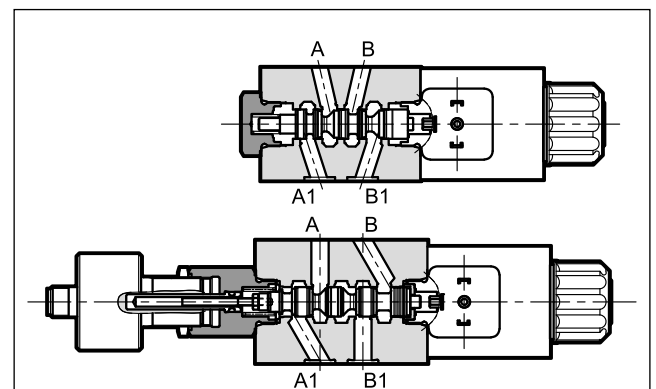
MODULAR VERSION
ISO 4401-03

p max 350 bar
Q max 50 l/min

MOUNTING INTERFACE



OPERATING PRINCIPLE



- M*F3 are shut-off valves, solenoid or hydraulically actuated, with or without spool position monitoring, in modular version, with mounting interface according to ISO 4401-03 standard.
- M*F3 valves are placed under directional control servovalves in order to guarantee the safety of circuit when a power failure occurs.
- Spools with float, closed, parallel or cross position in de-energized condition are available.

PERFORMANCE RATINGS

(working with mineral oil of viscosity of 36 cSt at 50°C)

| | | MDF3 | MCF3 |
|--|--|-------------|------------------|
| Maximum operating pressure: P - A - B ports T port | bar | 350 210 | 350 25 |
| Pilot pressure: min max | bar | - | 15 (NOTE) 210 |
| Maximum flow rate | l/min | 50 | 40 |
| Ambient temperature range | °C | -20 / +50 | |
| Fluid temperature range | °C | -20 / +80 | |
| Fluid viscosity range | cSt | 10 ÷ 400 | |
| Fluid contamination degree | According to ISO 4406:1999 class 20/18/15 | | |
| Recommended viscosity | cSt | 25 | |
| Mass | kg | 1,5 | 1,3 |

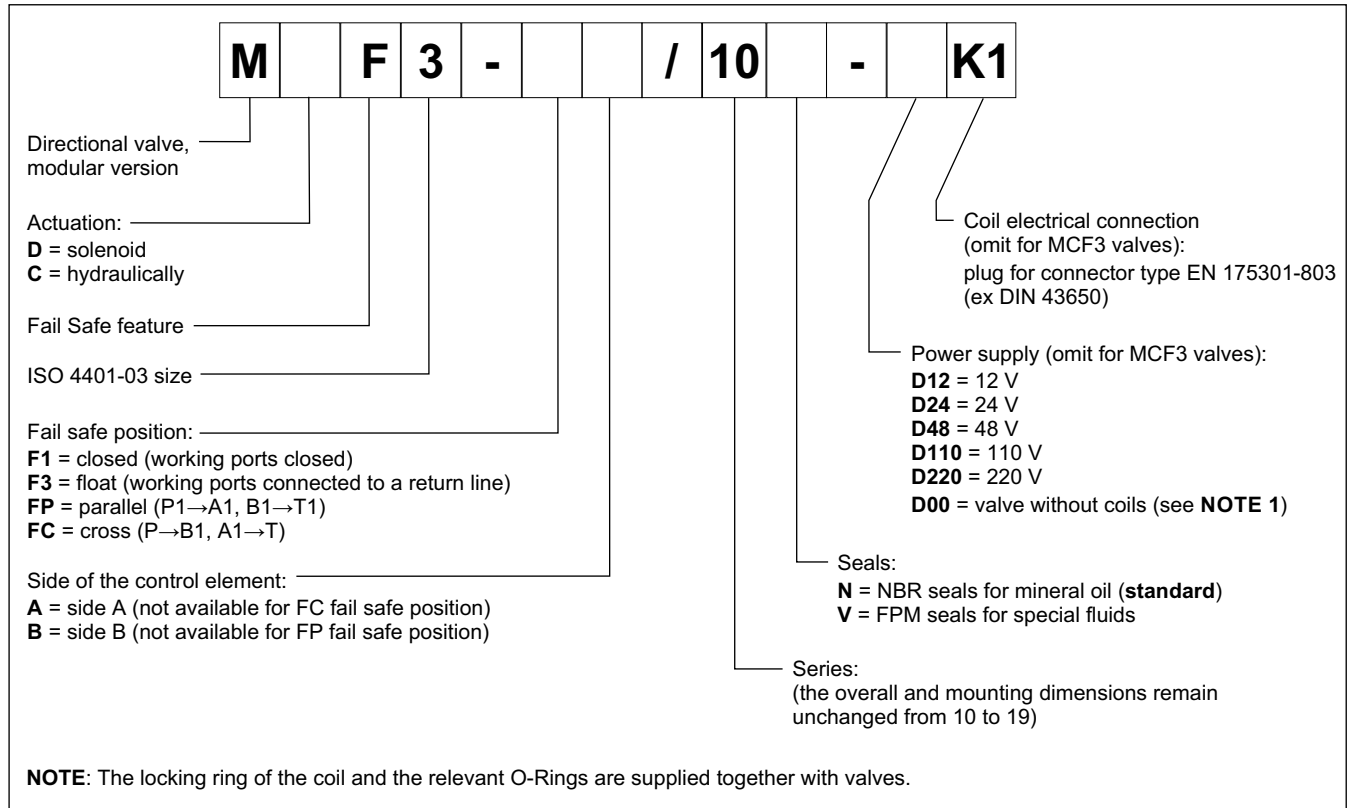
— Versions with spool monitoring do not have manual override and can not be disassembled, because of their characteristics and their possible use on machinery subject to safety requirements.

— The spool position monitoring is available either for initial position or for actuated position.

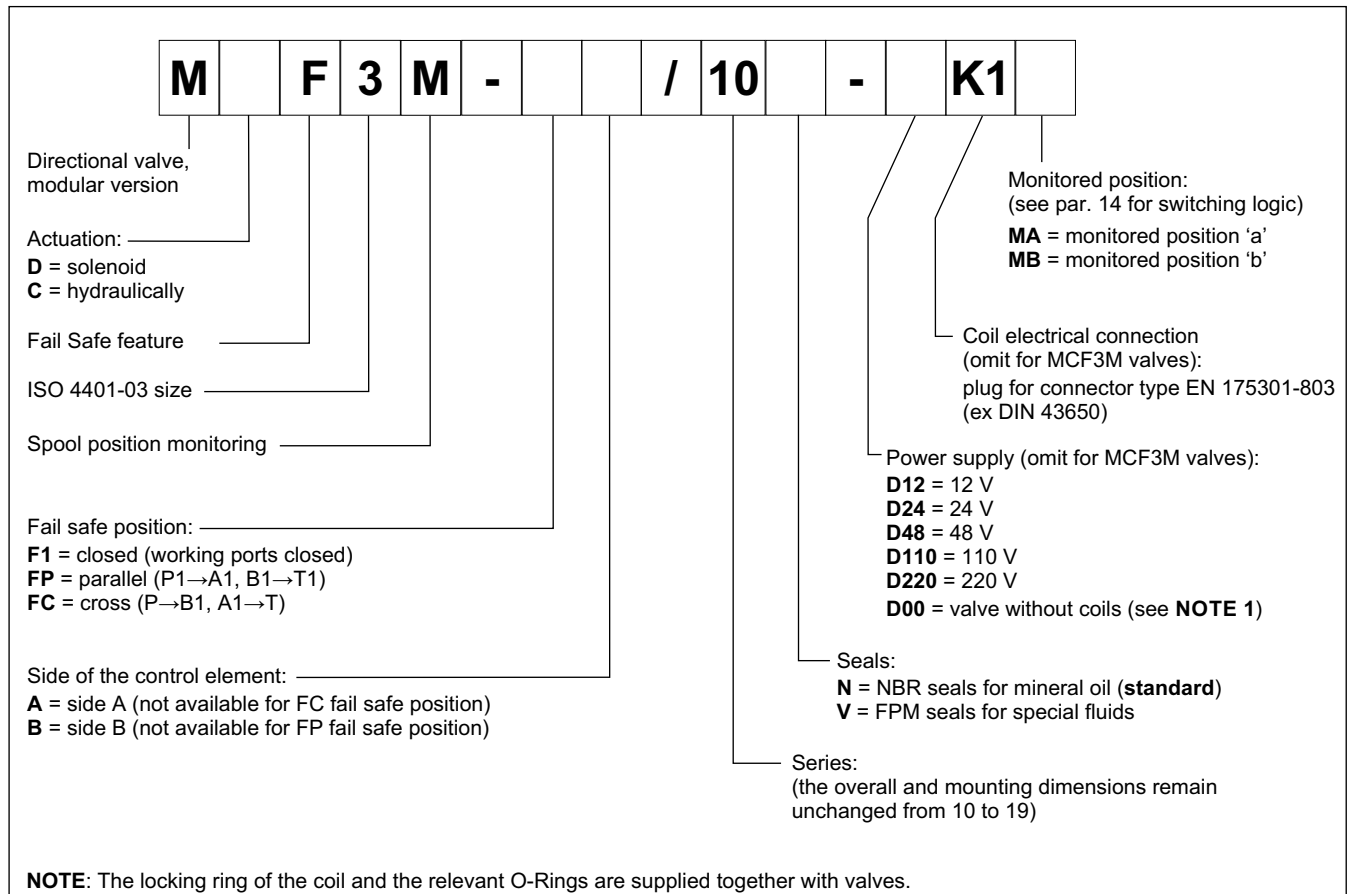
NOTE: The pilot pressure must be 10 to 20 bar higher than the return pressure to allow the fluid discharge from the pressure chamber.

1 - IDENTIFICATION CODES

1.1 - M*F3 valves

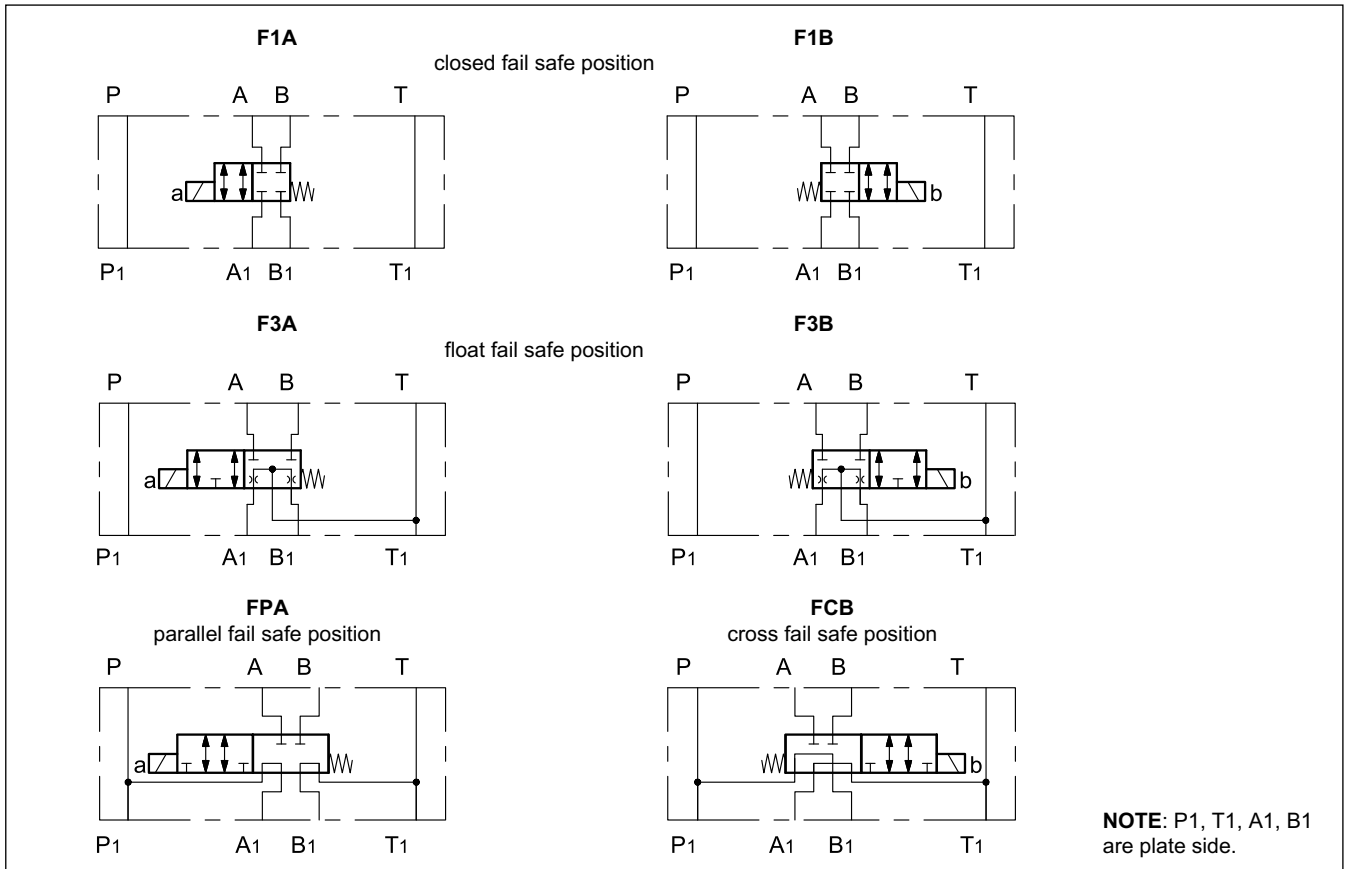


1.2 - M*F3M valves with monitored spools

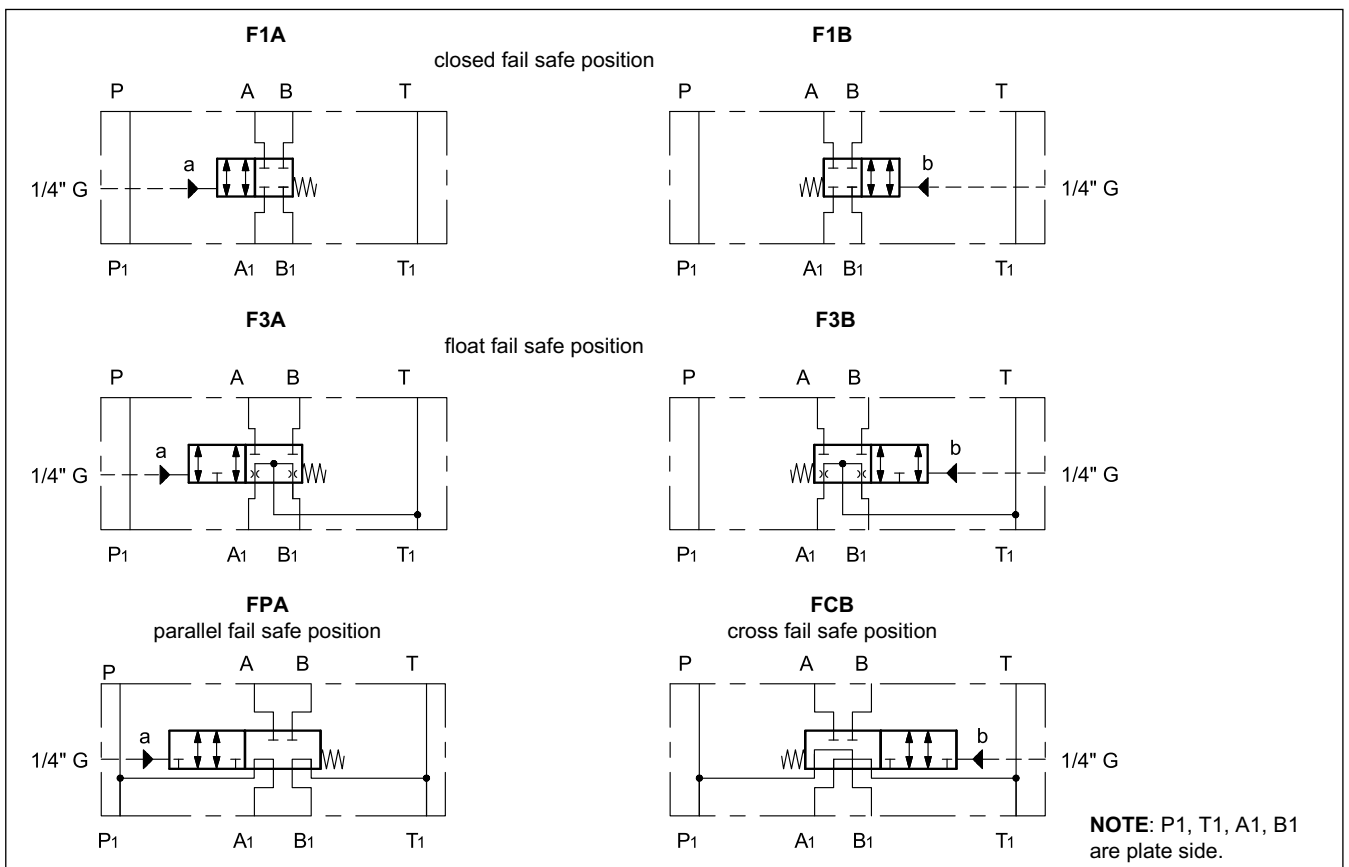


2 - HYDRAULIC SYMBOLS

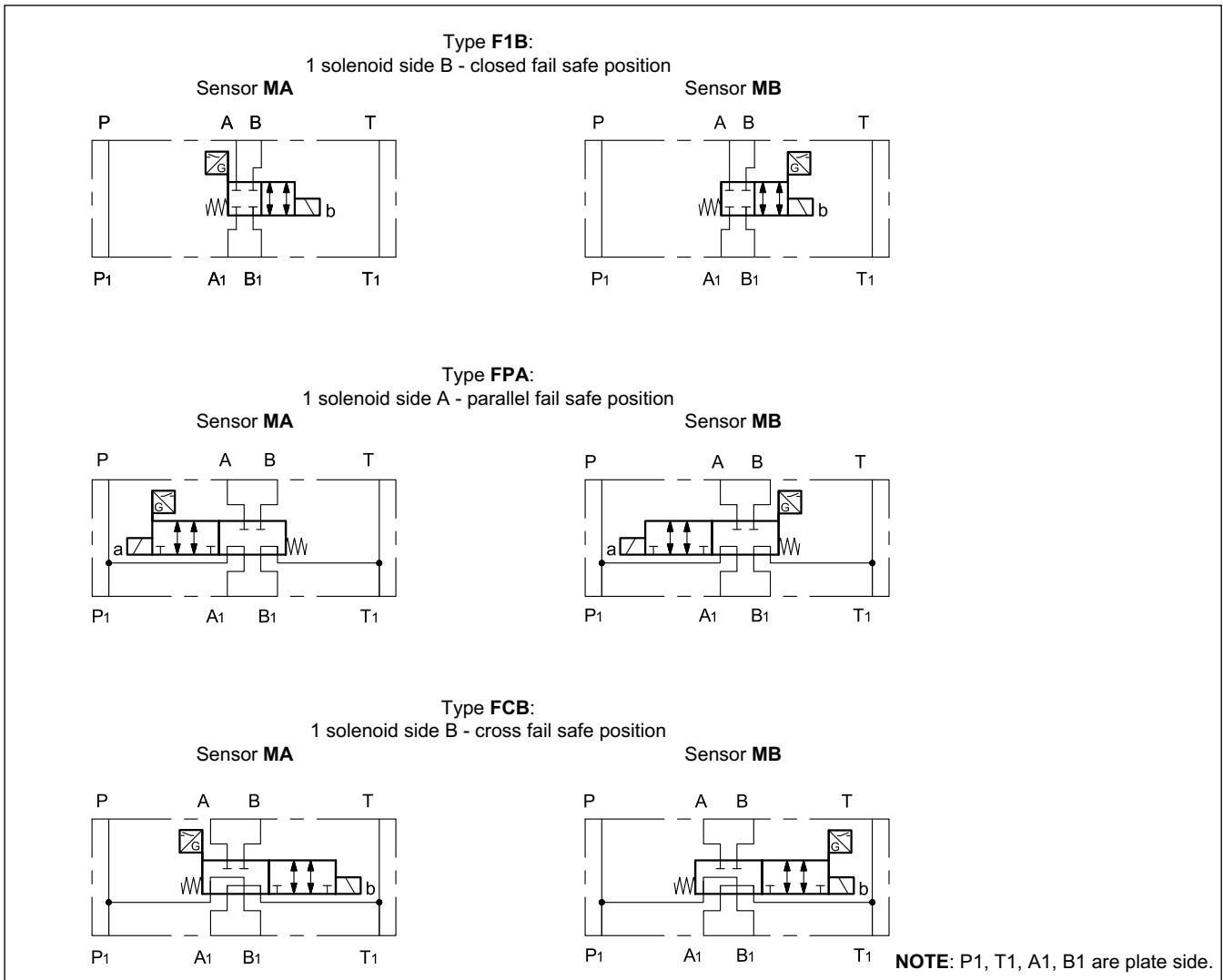
2.1 - MDF3 valves



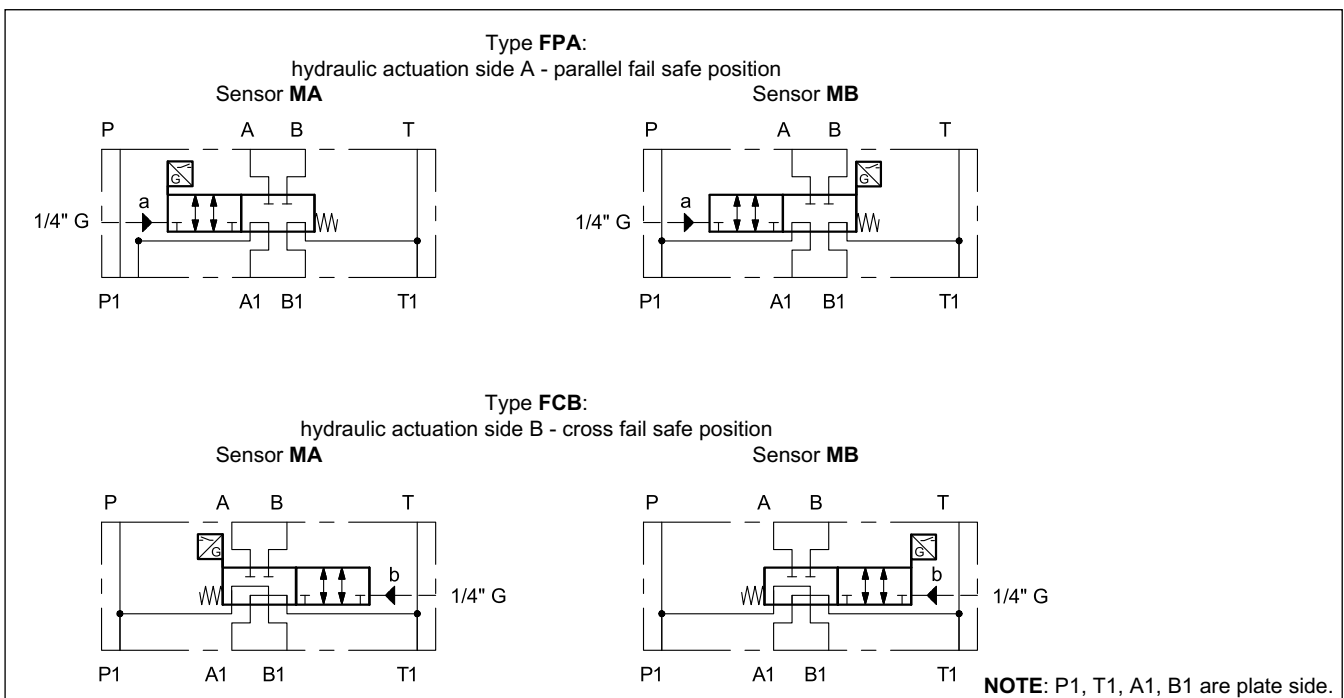
2.2 - MCF3 valves



2.3 - MDF3M valves with monitored spools



2.4 - MCF3M valves



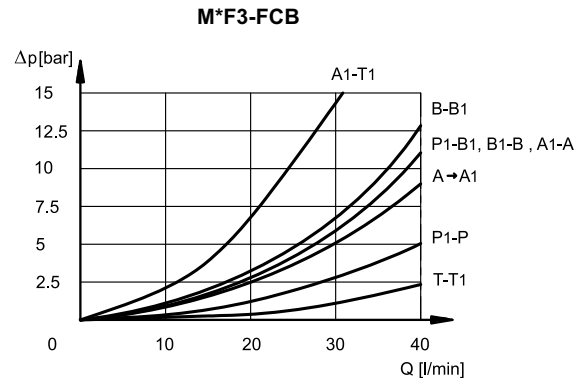
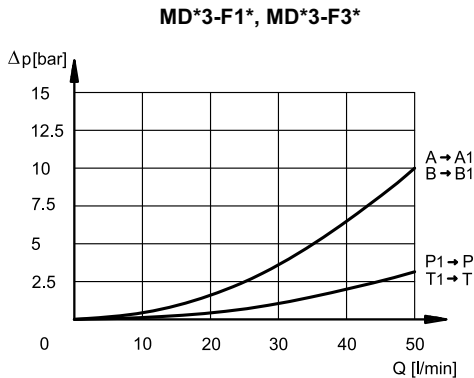
3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other fluid types such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

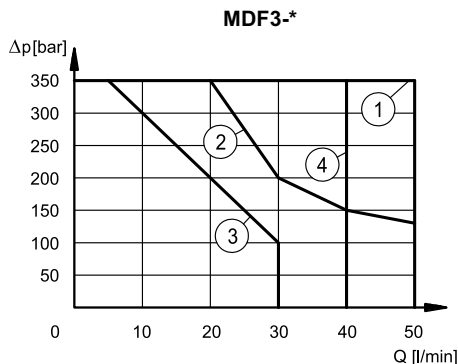
4 - PRESSURE DROPS Δp -Q

(obtained with viscosity 36 cSt at 50 °C)

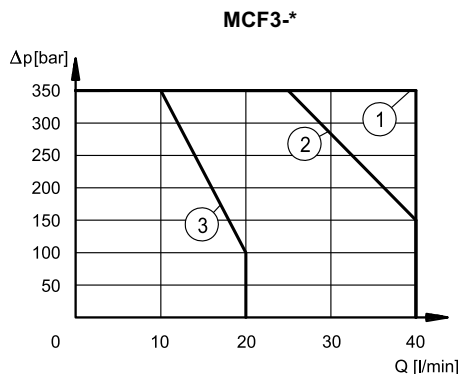


5 - OPERATING LIMITS

The values have been obtained according to ISO 6403 norm with solenoids at rated temperature and supplied with voltage equal to 90% of the nominal voltage. The values have been obtained with mineral oil, viscosity 36 cSt, temperature 50 °C and filtration according to ISO 4406:1999 class 18/16/13.



| SPOOL TYPE | De-energizing | Energizing | |
|-----------------|---------------|----------------------|-------------------------|
| | | with flow in A and B | without flow in A and B |
| CURVES ON GRAPH | | | |
| F1*, F3* | 1 | 2 | 1 |
| FCB | 4 | 3 | 3 |



| SPOOL TYPE | De-actuating | Actuating | |
|-----------------|--------------|-----------------------------|-----------------------------|
| | | pilot pressure tank +10 bar | pilot pressure tank +20 bar |
| CURVES ON GRAPH | | | |
| FCB | 1 | 3 | 2 |

6 - SWITCHING TIMES

The values indicated are obtained according to ISO 6403 standard, with mineral oil viscosity 36 cSt at 50 °C.

| TIMES [ms] | ENERGIZING | DE-ENERGIZING |
|------------------|------------|---------------|
| MDF3 - F1 | 60 ÷ 90 | 20 ÷ 50 ms |

7 - MDF3 - ELECTRICAL FEATURES

7.1 - Solenoids

These are essentially made up of two parts: tube and coil. The tube is threaded into the valve body and includes the armature that moves immersed in oil, without wear. The inner part, in contact with the oil in the return line, ensures heat dissipation.

The coil is fastened to the tube by a threaded ring; versions without the spool monitoring and can be rotated, to suit the available space.

NOTE 1: In order to further reduce the emissions, use of type H connectors is recommended. These prevent voltage peaks on opening of the coil supply electrical circuit (see cat. 49 000).

NOTE 2: The IP65 protection degree is guaranteed only with the connector correctly connected and installed.

| | |
|--|-------------------------------------|
| VOLTAGE SUPPLY FLUCTUATION | ± 10% Vnom |
| MAX SWITCH ON FREQUENCY | 18.000 ins/hr |
| DUTY CYCLE | 100% |
| ELECTROMAGNETIC COMPATIBILITY (EMC) (NOTE 1) | In compliance with 2014/30/EU |
| LOW VOLTAGE | In compliance with 2014/35/EU |
| CLASS OF PROTECTION Atmospheric agents (IEC 60529) Coil insulation (VDE 0580) Impregnation | IP65 (NOTE 2) class H class F |

7.2 - Current and absorbed power

The table shows current and power consumption values relevant to the different coil types for DC.

Using connectors type "D" (see cat. 49 000) with embedded bridge rectifier it is possible to feed DC coils (starting from 48V voltage) with alternating current (50 or 60 Hz), considering a reduction of the operating limits of about 5-10%.

Coils for direct current (values ± 10%)

| | Nominal voltage [V] | Resistance at 20°C [Ω] | Current consumpt. [A] | Power consumpt [W] | Coil code |
|-------------|---------------------|------------------------|-----------------------|--------------------|-----------|
| D12 | 12 | 4,4 | 2,72 | 32,7 | 1903080 |
| D24 | 24 | 18,6 | 1,29 | 31 | 1903081 |
| D48 | 48 | 78,6 | 0,61 | 29,5 | 1903083 |
| D110 | 110 | 423 | 0,26 | 28,2 | 1903464 |
| D220 | 220 | 1692 | 0,13 | 28,2 | 1903465 |

8 - ELECTRIC CONNECTORS

Solenoid operated valves are delivered without connectors. Connectors can be ordered separately. See catalogue 49 000.

9 - MDF3 OVERALL AND MOUNTING DIMENSIONS

MDF3-F1*
MDF3-F3*

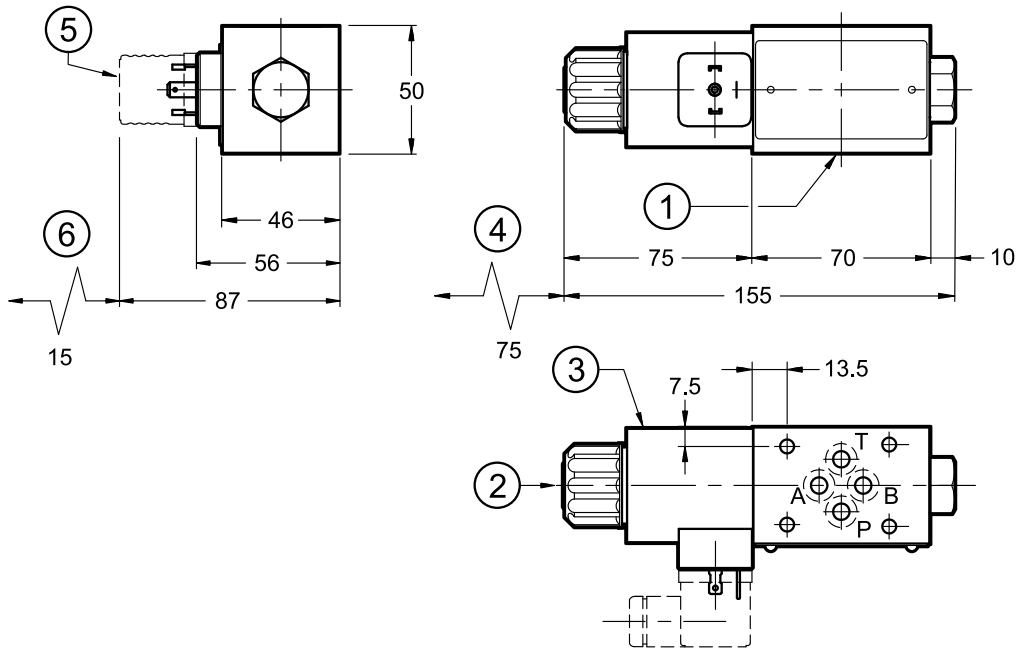
dimensions in mm

Actuation on side A

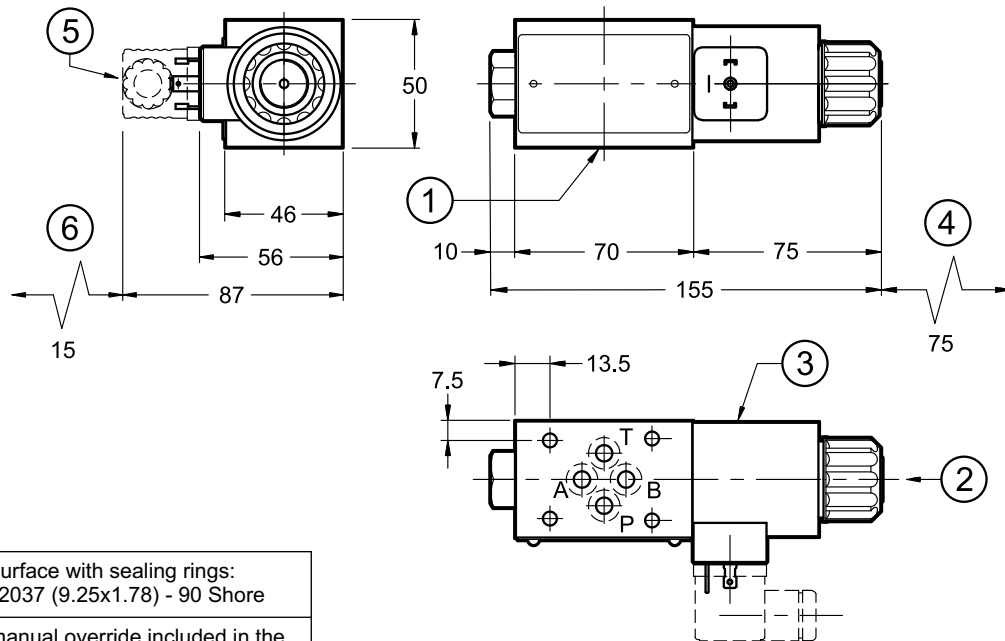
| | |
|---|--|
| 1 | Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) - 90 Shore |
| 2 | Standard manual override included in the solenoid tube |
| 3 | Coil 360° revolving |
| 4 | Coil removal space |
| 5 | EN 175301-803 (ex DIN 43650) electrical connector to be ordered separately (see cat. 49 000) |
| 6 | Connector removal space |

MDF3-FPA

dimensioni in mm



MDF3-FCB

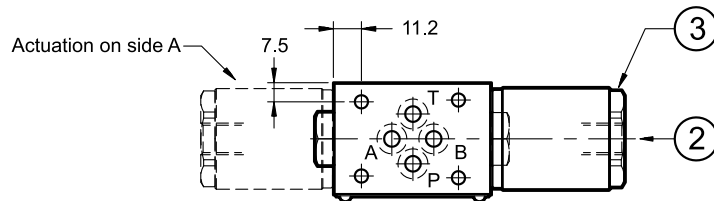
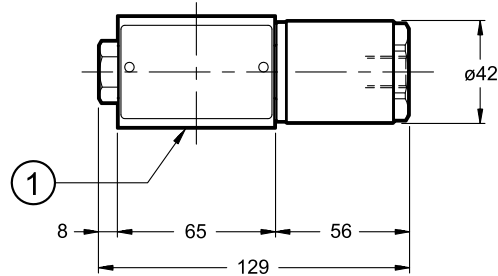
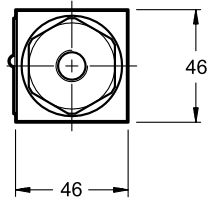


| | |
|---|--|
| 1 | Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) - 90 Shore |
| 2 | Standard manual override included in the solenoid tube |
| 3 | Coil 360° revolving |
| 4 | Coil removal space |
| 5 | EN 175301-803 (ex DIN 43650) electrical connector to be ordered separately (see cat. 49 000) |
| 6 | Connector removal space |

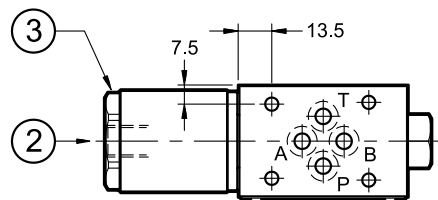
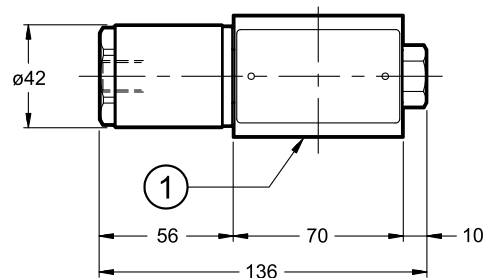
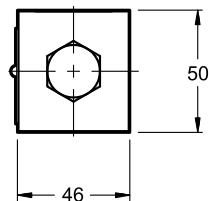
10 - MCF3 OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

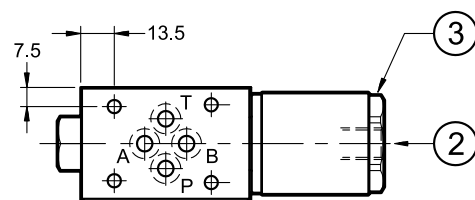
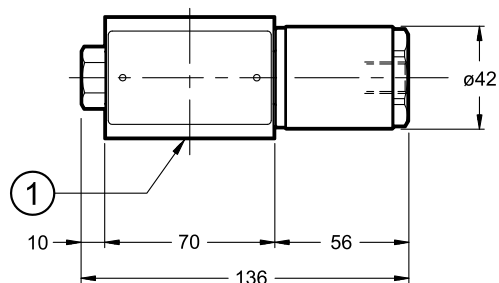
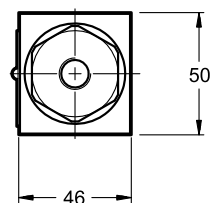
MCF3-F1*
MCF3-F3*



MCF3-FPA

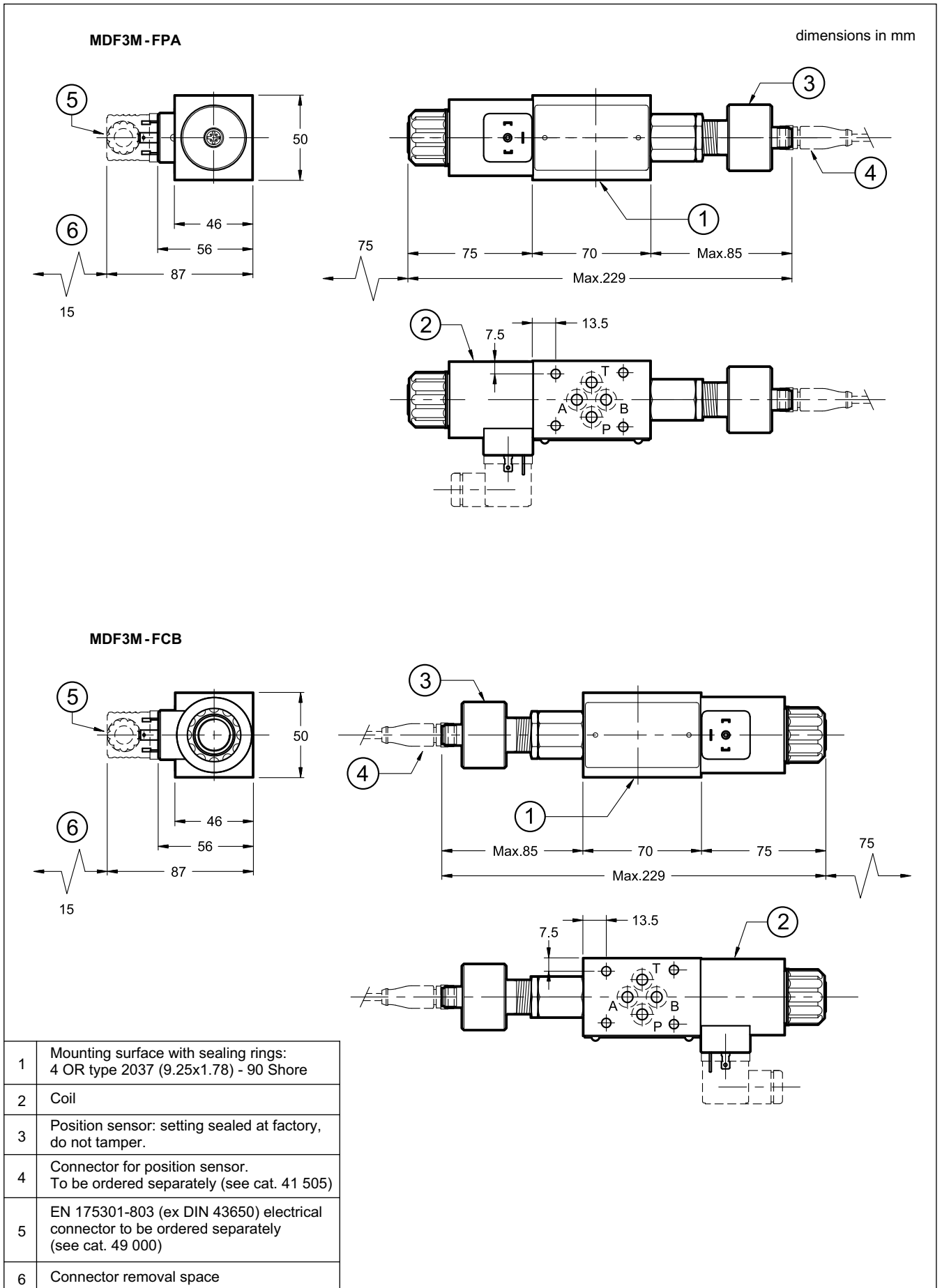


MCF3-FCB



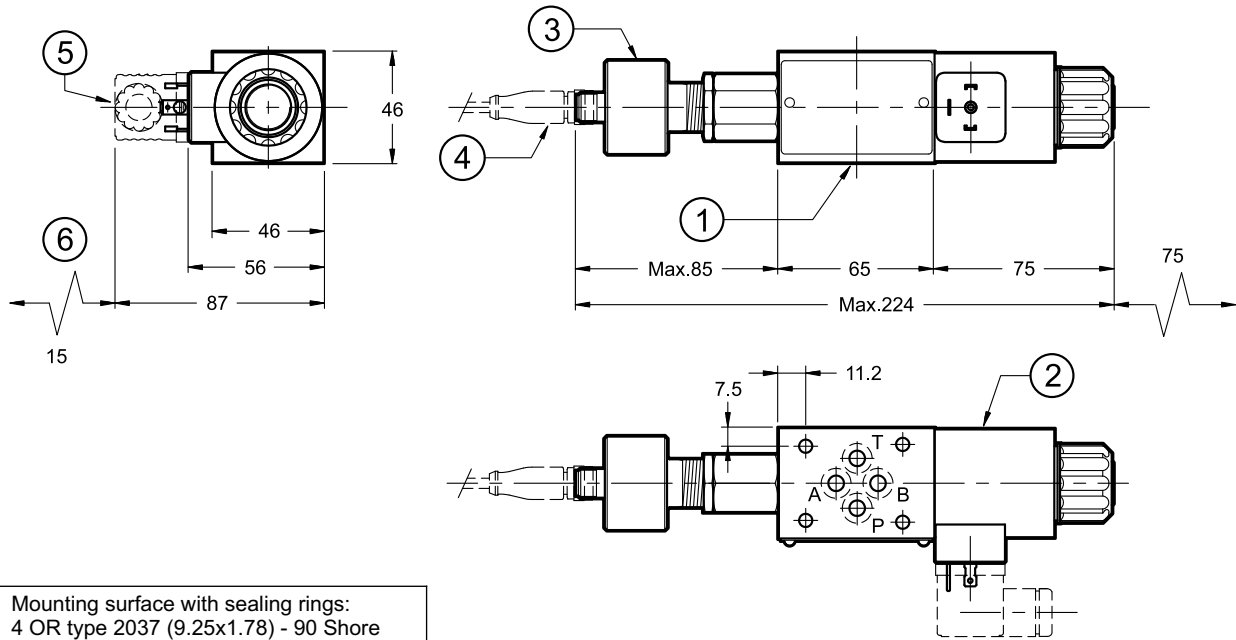
| | |
|---|---|
| 1 | Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) - 90 Shore |
| 2 | 1/4" BSP connection for hydraulic actuation |
| 3 | Hexagon: spanner 38 Tightening torque 35 ± 40 Nm |

11 - MDF3M OVERALL AND MOUNTING DIMENSIONS



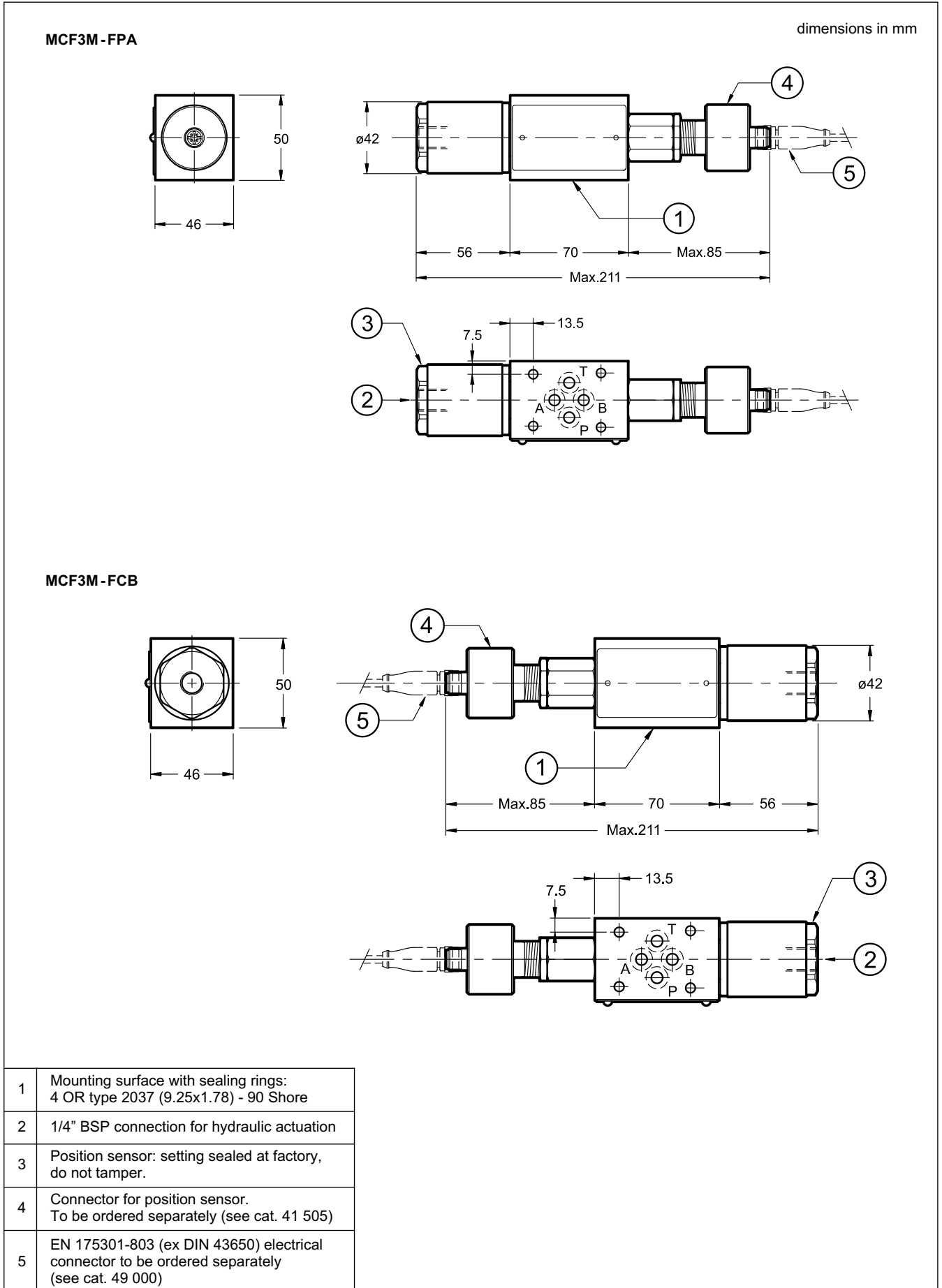
MDF3M - F1B

dimensions in mm



| | |
|---|--|
| 1 | Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) - 90 Shore |
| 2 | Coil |
| 3 | Position sensor: setting sealed at factory, do not tamper. |
| 4 | Connector for position sensor. To be ordered separately (see cat. 41 505) |
| 5 | EN 175301-803 (ex DIN 43650) electrical connector to be ordered separately (see cat. 49 000) |
| 6 | Connector removal space |

12 - MCF3M OVERALL AND MOUNTING DIMENSIONS

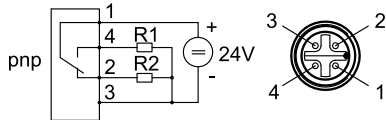


13 - M*F3M POSITION SENSOR



WARNING ! Valve disassembling is not allowed. Sensors must not be unscrewed or tampered.

CONNECTION SCHEME



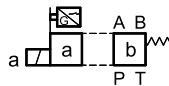
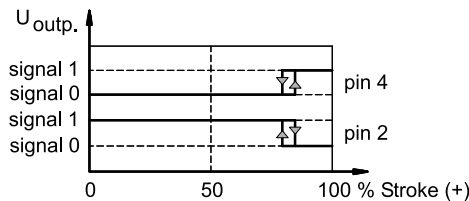
| Pin | Values | Function |
|-----|--------|---------------|
| 1 | +24 V | Supply |
| 2 | NC | Normal Closed |
| 3 | 0 V | - |
| 4 | NO | Normal Open |

| | | |
|---|------|-------------------------------------|
| Operating voltage range | V DC | 20 ÷ 32 |
| Absorbed current | A | 0.4 |
| Max output load | mA | 400 |
| Output | | 2 PNP |
| Electric protections | | polarity inversion short circuit |
| Hysteresis | mm | ≤ 0.1 |
| Operating temperature range | °C | -25 / +80 |
| Class of protection from atmospheric agents (IEC 60529) | | IP65 |
| EMC Electromagnetic compatibility | | In compliance with 2014/30/EU |

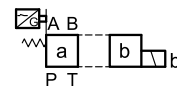
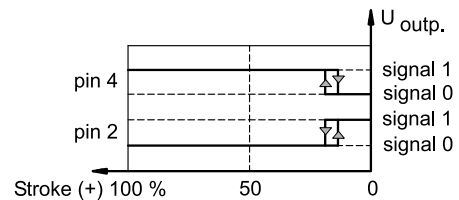
14 - SWITCHING LOGICS

14.1 - MA monitoring

Energized position monitored.
for M*F3M-*F*A valves

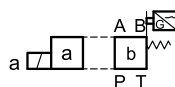
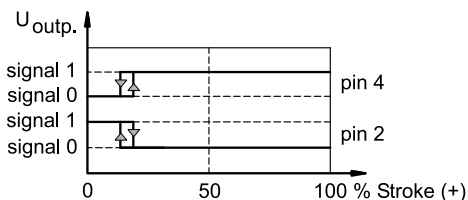


De-energized position monitored.
for M*F3M-*F*B valves



14.2 - MB monitoring

De-energized position monitored.
for M*F3M-*A valves



Energized position monitored.
for M*F3M-*B valves

