



PZE3J*

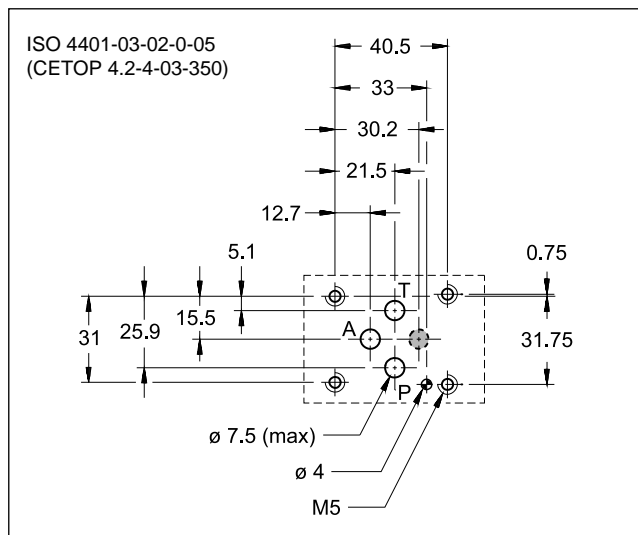
PROPORTIONAL THREE-PORT PRESSURE REDUCING VALVE, WITH PRESSURE CLOSED LOOP AND INTEGRATED ELECTRONICS

SUBPLATE MOUNTING ISO 4401-03

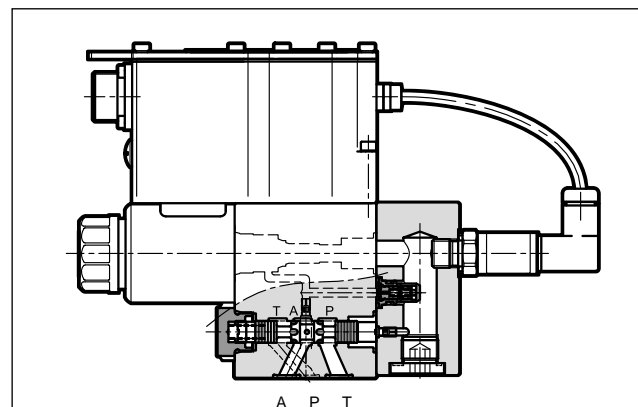
p max **350** bar

Q max **40** l/min

MOUNTING SURFACE



OPERATING PRINCIPLE



— PZE3J* valve is a proportional three-port pressure reducing valve, pilot operated, with pressure feedback, on-board electronics and mounting surface according to ISO 4401-03 standards.

— This valve controls the outlet pressure on port A, reducing the inlet pressure from line P or relieving the overpressure from line A into T keeping it at the set value. (typically: hydraulic counter-weight or load balancing)

PERFORMANCES

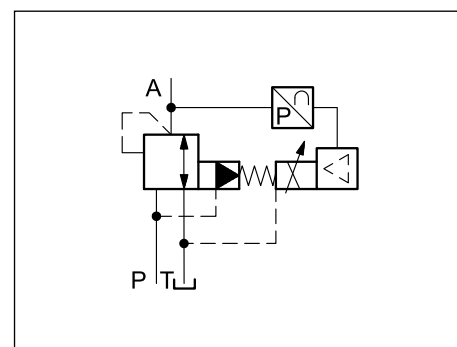
(obtained with mineral oil with viscosity of 36 cSt at 50°C and p = 140 bar)

| | | |
|---|--|-----------|
| Maximum operating pressure: - P port - T port | bar | 350 2 |
| Maximum flow (see p max = f(Q) diagram) | l/min | 40 |
| Step response | see point 7 | |
| Hysteresis | % of p nom | < 1 % |
| Repeatability | % of p nom | < ± 0.5% |
| Electrical characteristic | see point 2 | |
| Ambient temperature range | °C | -20 / +60 |
| Fluid temperature range | °C | -20 / +80 |
| Fluid viscosity range | cSt | 10 ÷ 400 |
| Fluid contamination degree | According to ISO 4406:1999 class 18/16/13 | |
| Recommended viscosity | cSt | 25 |
| Mass | kg | 3 |

— The valve is available with different types of electronics, with analogue or fieldbus interfaces.

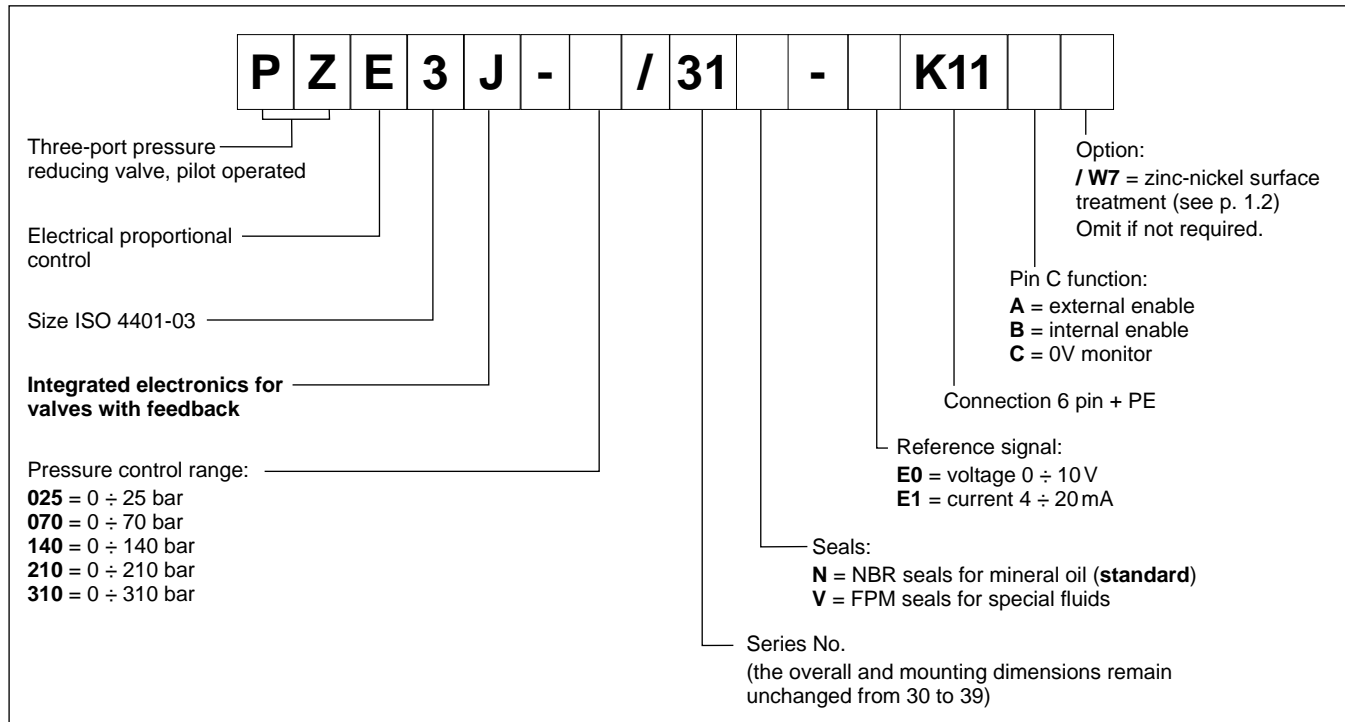
— The valve is easy to install. The driver directly manages digital settings.

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

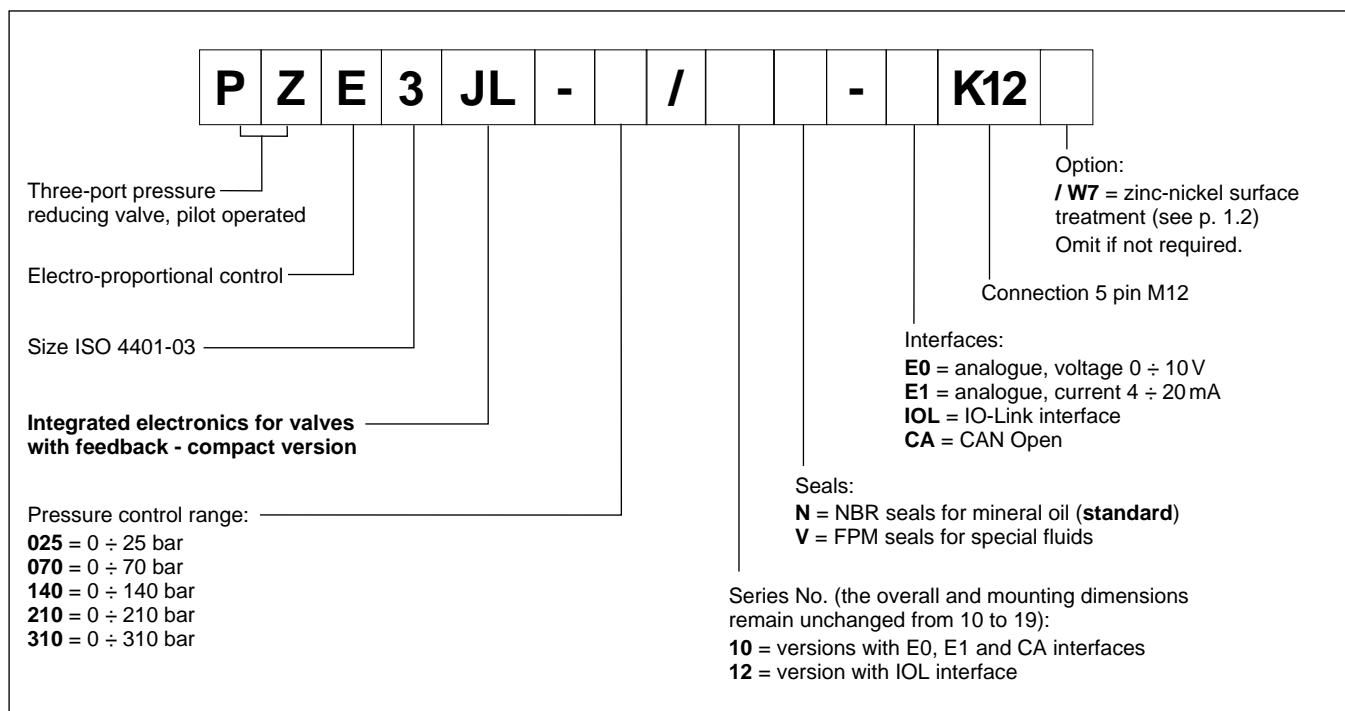
1.1 - Standard electronics



1.2 - Surface treatments

The standard valve is supplied with surface treatment of phosphating black. The zinc-nickel finishing on the valve body makes the valve suitable to ensure a salt spray resistance up to 240 hours. (test operated according to UNI EN ISO 9227 standards and test evaluation operated according to UNI EN ISO 10289 standards).

1.3 - Compact electronics



1.4 - Electronics with fieldbus communication

| | | | | | | | | | | | | | | |
|---|---|---|---|----|---|---|----|---|-----|---|--|--|--|--|
| P | Z | E | 3 | JH | - | / | 31 | - | K16 | / | | | | |
|---|---|---|---|----|---|---|----|---|-----|---|--|--|--|--|

Three-port pressure reducing valve, pilot operated

Electro-proportional control

Size ISO 4401-03

Integrated electronics with fieldbus communication for valves with feedback

Pressure control range: _____

025 = 0 ÷ 25 bar
070 = 0 ÷ 70 bar
140 = 0 ÷ 140 bar
210 = 0 ÷ 210 bar
310 = 0 ÷ 310 bar

Series No. (the overall and mounting dimensions remain unchanged from 30 to 39)

Seals: _____

N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

Reference signal: _____

E0 = voltage 0 ÷ 10 V
E1 = current 4 ÷ 20 mA
FD = full digital version (on request)

Option:
/ W7 = zinc-nickel surface treatment (see p. 1.2)
Omit if not required.

X4 Analogue transducer:
0 = none
1 = single/double transducer

X7 Digital transducer:
0 = none
1 = SSI type

X2, X3 Fieldbus type:
EC = EtherCAT
EN = Ethernet /IP
PN = Profinet

X1 Main connection configuration:
D1 = one command
D0 = full digital version (on request - available for reference signal FD type only)

Main connection: 11 pin + PE

2 - ELECTRONICS COMMON DATA

| | | |
|---|------|--|
| Duty cycle | | 100% (continuous operation) |
| Protection class according to EN 60529 | | IP65 / IP67 (NOTE) |
| Supply voltage | V DC | 24 (from 19 to 30 VDC), ripple max 3 Vpp |
| Power consumption | VA | 25 |
| Maximum solenoid current | A | 1.88 |
| Fuse protection, external | A | 2A time lag |
| Managed breakdowns | | Overload and electronics overheating, cable breakdown, supply voltage failures |
| Electromagnetic compatibility (EMC) emissions EN 61000-6-4, immunity EN 61000-6-2 | | According to 2014/30/EU standards |

NOTE: The IP degree is guaranteed only with mating connector of equivalent IP degree, installed and tightened correctly. Moreover, on the JH versions it is necessary to protect any unused connections with caps.

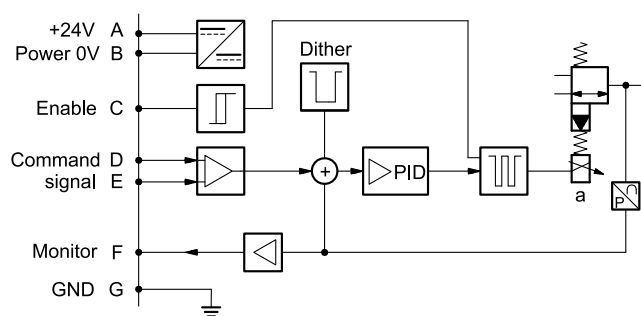
3 - PZE3J - STANDARD ELECTRONICS

3.1 - Electrical characteristics

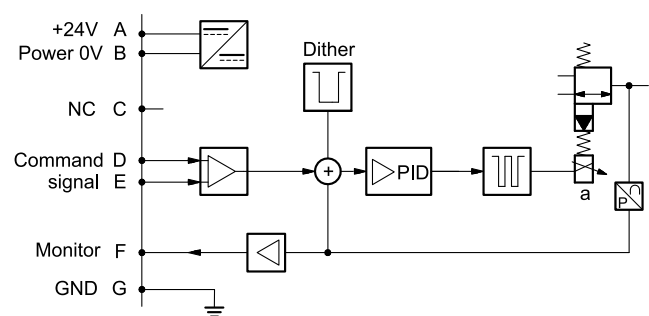
| | | | |
|--|------------------------------|------------|---|
| Command signal: | voltage (E0) current (E1) | V DC mA | 0 ÷ 10 (impedance $R_i > 11 \text{ k}\Omega$) 4 ÷ 20 (impedance $R_i = 58 \text{ }\Omega$) |
| Monitor signal (pressure at transducer): | voltage (E0) current (E1) | V DC mA | 0 ÷ 10 (impedance $R_o > 1 \text{ k}\Omega$) 4 ÷ 20 (impedance $R_o = 500 \text{ }\Omega$) |
| Communication for diagnostic | | | LIN-bus Interface (by means of the optional kit) |
| Connection | | | 6 pin + PE (MIL-C-5015-G - DIN EN 175201-804) |

3.2 - On-board electronics diagrams

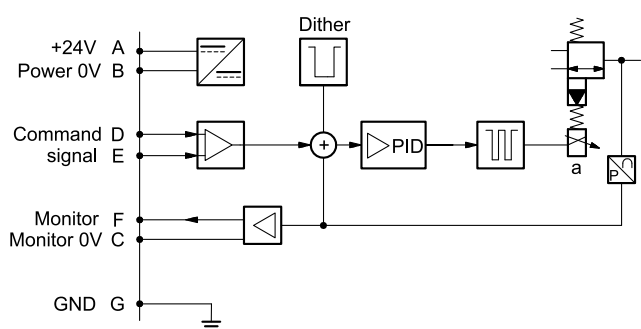
VERSION A - External Enable



VERSION B - Internal Enable

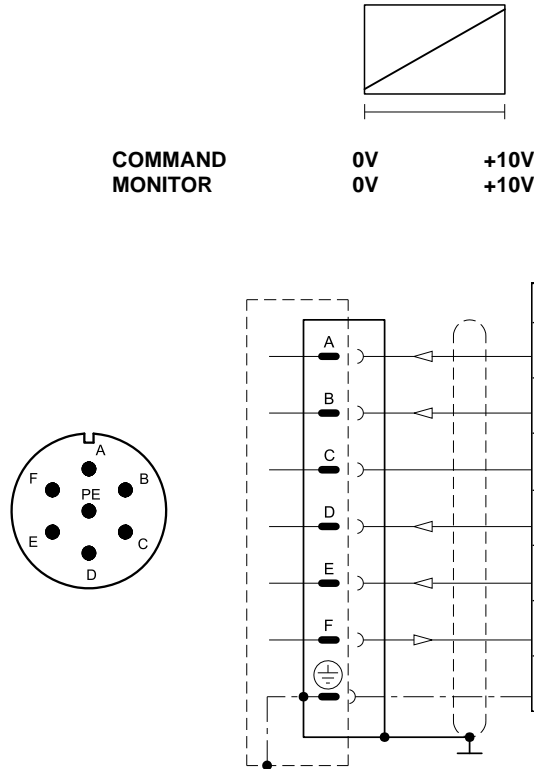


VERSION C - 0V Monitor



3.3 - Versions with voltage command (E0)

The reference signal is between $0 \div 10V$. The monitor feature of versions B and C becomes available with a delay of 0.5 sec from the power-on of the card.

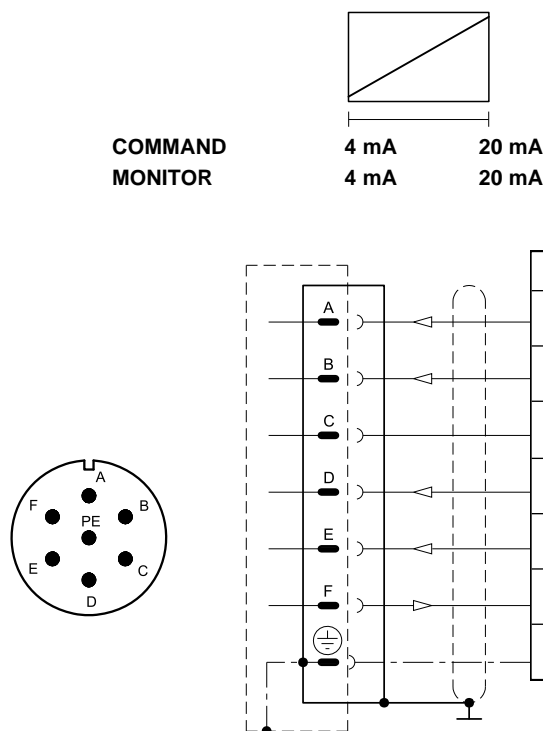


| Pin | Values | version A | version B | version C |
|-----|---------------|-------------------------------|---------------------|------------------------|
| A | 24 V DC | Supply Voltage | | |
| B | 0 V | | | |
| C | | Enable 24 V DC | do not connect - | PIN F reference 0 V |
| D | $0 \div 10 V$ | Command (differential input) | | |
| E | 0 V | Command reference | | |
| F | $0 \div 10 V$ | Monitor (0V reference: pin B) | | Monitor |
| PE | GND | Ground (Earth) | | |

3.4 - Versions with current command (E1)

The reference signal is supplied in current $4 \div 20$ mA. If the current for command is lower the card shows a breakdown cable error. To reset the error is sufficient to restore the signal.

The monitor feature of versions B and C becomes available with a delay of 0.5 sec from the power-on of the card.



| Pin | Values | version A | version B | version C |
|-----|----------------|-------------------------------|---------------------|------------------------|
| A | 24 V DC | Supply Voltage | | |
| B | 0 V | | | |
| C | | Enable 24 V DC | do not connect - | PIN F reference 0 V |
| D | $4 \div 20$ mA | Command | | |
| E | 0 V | Command reference | | |
| F | $4 \div 20$ mA | Monitor (0V reference: pin B) | | Monitor |
| PE | GND | Ground (Earth) | | |

4 - PZE3JL - COMPACT ELECTRONICS


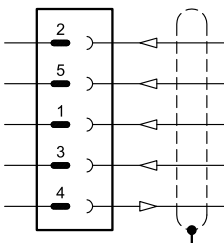
In IO-Link networks, the length of the connecting cables is limited to 20 metres. In CA versions, pin 3 and pin 5 are galvanic isolated up to 100 V to avoid earth loops.

4.1 - Electrical characteristics

| | | | |
|--|------------------------------|------------|---|
| Command signal: | voltage (E0) current (E1) | V DC mA | 0 ÷ 10 (impedance $R_i > 11 \text{ k}\Omega$) 4 ÷ 20 (impedance $R_i = 58 \text{ }\Omega$) |
| Monitor signal (pressure at transducer): | voltage (E0) current (E1) | V DC mA | 0 ÷ 5 (impedance $R_o > 1 \text{ k}\Omega$) 4 ÷ 20 (impedance $R_o = 500 \text{ }\Omega$) |
| IO-Link communication (IOL): | Data rate | kBaud | IO-Link Port Class B 38.4 |
| Can Open communication (CA): | Data rate | kbit | 10 ÷ 1000 |
| Data register (IOL and CA versions only) | | | card voltage supply, solenoid faults (shortcircuit, bad configuration), box temperature. |
| Connection | | | 5-pin M12 code A (IEC 61076-2-101) |


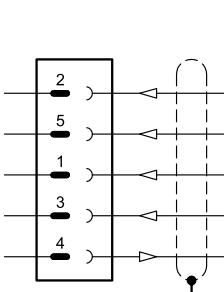
4.2 - Pin tables

'E0' connection


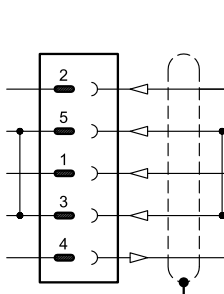
| Pin | Values | Function |
|-----|----------|-------------------------------------|
| 2 | 24 V DC | Supply voltage (solenoid and logic) |
| 5 | 0 V | |
| 1 | 0 ÷ 10 V | Command |
| 3 | 0 V | Command reference |
| 4 | 0 ÷ 5 V | Monitor (0V reference: pin 5) |

'E1' connection

| Pin | Values | Function |
|-----|-----------|-------------------------------------|
| 2 | 24 V DC | Supply voltage (solenoid and logic) |
| 5 | 0 V | |
| 1 | 4 ÷ 20 mA | Command |
| 3 | 0V | Command reference |
| 4 | 4 ÷ 20 mA | Monitor (0V reference: pin 5) |


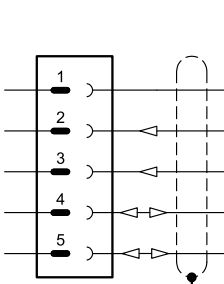
'IOL' connection

| Pin | Values | Function |
|-----|---------------|----------------------------------|
| 2 | 2L+ 24 V DC | Solenoid supply voltage |
| 5 | 2L- 0 V (GND) | |
| 1 | 1L+ +24 V DC | Logic and IO-Link supply voltage |
| 3 | 1L- 0V (GND) | |
| 4 | C/Q | IO-Link Communication |

NOTE: Pin 3 and pin 5 are linked with each other in the valve electronics. The reference potentials 1L- and 2L- of the two supply voltages must also be linked with each other on the customer side.

'CA' connection

| Pin | Values | Function |
|-----|-----------|-----------------|
| 1 | CAN_SH | Shield |
| 2 | 24 V DC | Supply voltage |
| 3 | 0 V (GND) | |
| 4 | CAN H | Bus line (high) |
| 5 | CAN_L | Bus line (low) |

5 - PZE3JH - FIELDBUS ELECTRONICS

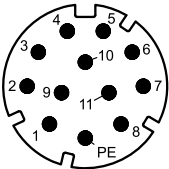
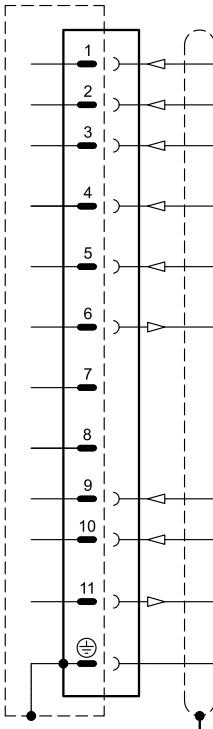
The 11+ PE pin connection allows separate supply voltage for electronics and solenoid.

Command - valve position schemes as for the standard electronics. Please refer to pictures in point 3.3 and 3.4.

5.1 - Electrical characteristics

| | | | |
|--|--|------------|---|
| Command signal: | voltage (E0) current (E1) digital (FD) | V DC mA | 0 ÷ 10 (impedance Ri > 11 kOhm) 4 ÷ 20 (impedance Ri = 58 Ohm) via fieldbus |
| Monitor signal (pressure at transducer): | voltage (E0) current (E1) | V DC mA | 0 ÷ 10 (impedance Ro > 1 kOhm) 4 ÷ 20 (impedance Ro = 500 Ohm) |
| Communication / diagnostic | | | via Bus register |
| Communication interface standard | | | IEC 61158 |
| Communication physical layer | | | fast ethernet, insulated 100 Base TX |
| Power connection | | | 11 pin + PE (DIN 43651) |

5.2 - X1 Main connection pin table

D1: one command

| Pin | Values | Function |
|-----|------------------------------|--|
| 1 | 24 V DC | Main supply voltage |
| 2 | 0 V | |
| 3 | 24V DC | Enable |
| 4 | 0 ÷ 10 V (E0) 4 ÷ 20 (E1) | Command |
| 5 | 0 V | Command reference signal |
| 6 | 0 ÷ 10 V (E0) 4 ÷ 20 (E1) | Monitor (0V reference pin 10) |
| 7 | NC | do not connect |
| 8 | NC | do not connect |
| 9 | 24 V DC | Logic and control supply |
| 10 | 0 V | |
| 11 | 24 V DC | Fault (0V DC) or normal working (24V DC) (0V reference pin 2) |
| 12 | GND | Ground (Earth) |

D0: full digital

| Pin | Values | Function |
|-----|---------|--|
| 1 | 24 V DC | Main supply voltage |
| 2 | 0 V | |
| 3 | 24V DC | Enable |
| 4 | NC | do not connect |
| 5 | NC | do not connect |
| 6 | NC | do not connect |
| 7 | NC | do not connect |
| 8 | NC | do not connect |
| 9 | 24 V DC | Logic and control supply |
| 10 | 0 V | |
| 11 | 24 V DC | Fault (0V DC) or normal working (24V DC) (0V reference pin 2) |
| 12 | GND | Ground (Earth) |

5.3 - FIELDBUS connections

Please wire following guidelines provided by the related standards communication protocol. Any connections present and not used must be protected with special caps so as not to nullify the protection against atmospheric agents.

X2 (IN) connection M12 D 4 pin female



| Pin | Values | Function |
|---------|--------|-------------|
| 1 | TX+ | Transmitter |
| 2 | RX+ | Receiver |
| 3 | TX- | Transmitter |
| 4 | RX- | Receiver |
| HOUSING | shield | |

X3 (OUT) connection: M12 D 4 pin female



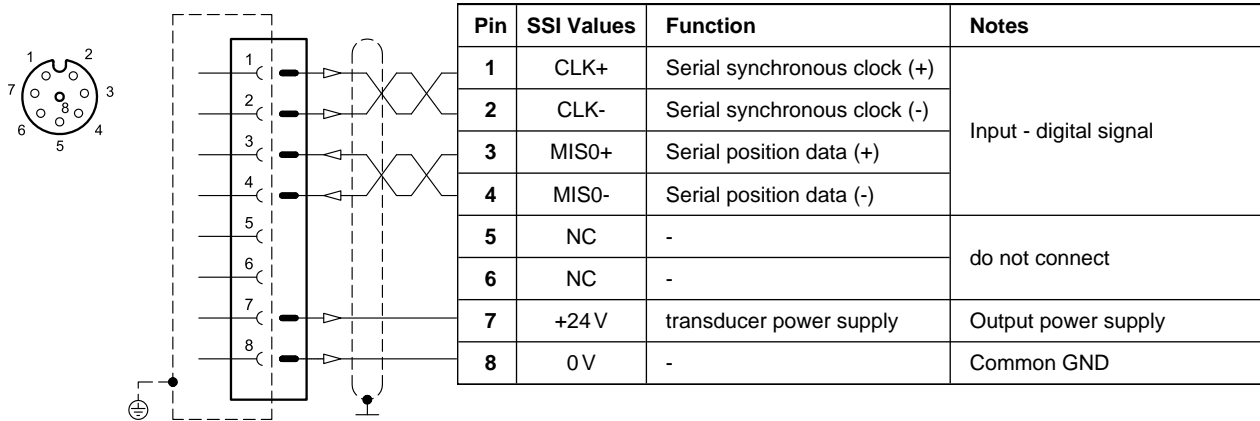
| Pin | Values | Function |
|---------|--------|-------------|
| 1 | TX+ | Transmitter |
| 2 | RX+ | Receiver |
| 3 | TX- | Transmitter |
| 4 | RX- | Receiver |
| HOUSING | shield | |

NOTE: Shield connection on connector housing is recommended.

5.4 - Digital transducer connection

X7 connection: M12 A 8 pin female

VERSION 1: SSI type

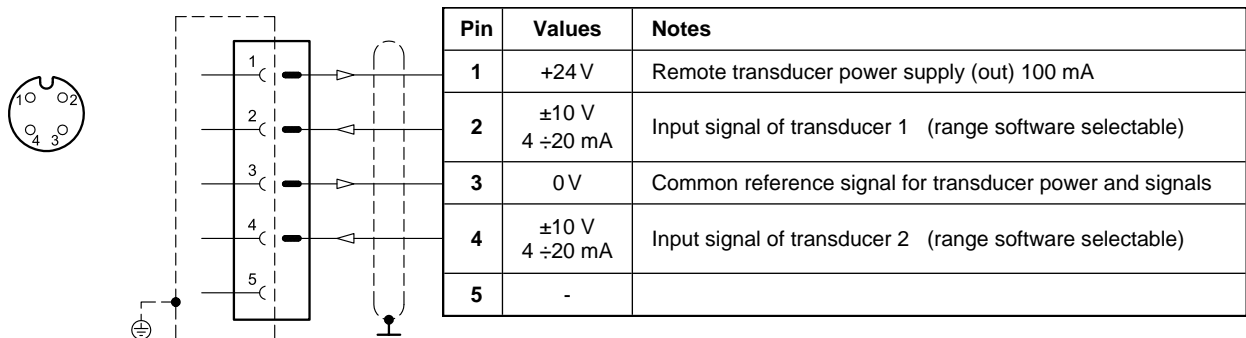


5.5 - Analogue transducer connection

X4 connection: M12 A 4 pin female

VERSION 1: single / double transducer

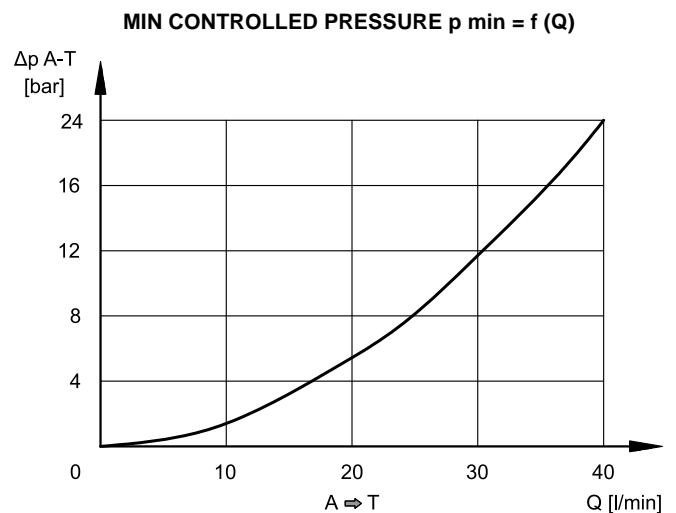
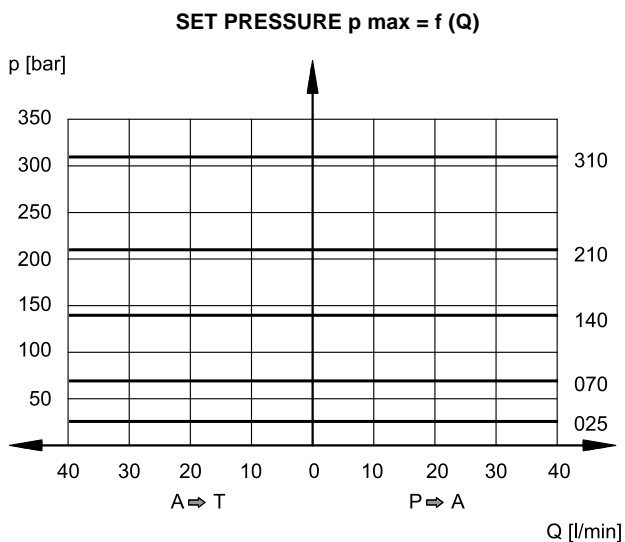
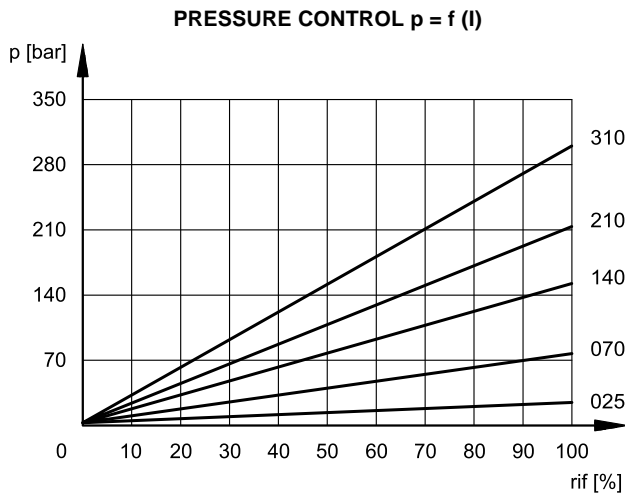
(single or double is a software-selectable option)



6 - CHARACTERISTIC CURVES

(measured with viscosity of 36 cSt at 50°C)

Typical control characteristics, according to the reference signal for available pressure control ranges. Characteristic curves measured without backpressure in T, with linearity and hysteresis compensation set by the onboard electronics.

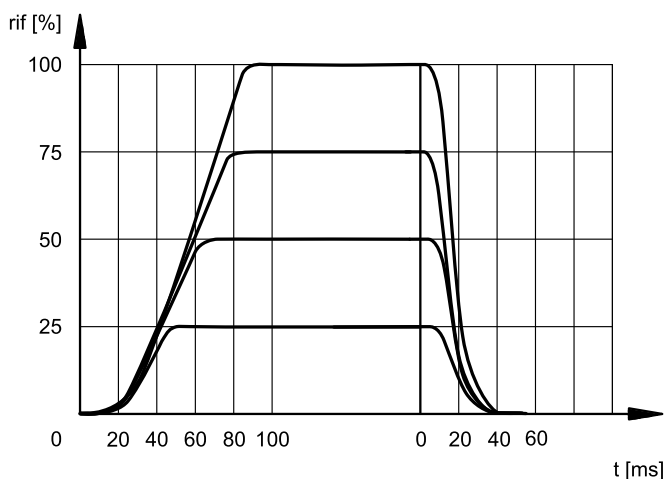


Pressure drops A → T vs. flow, without backpressure in T port and reference signal = 0 %

7 - RESPONSE TIMES

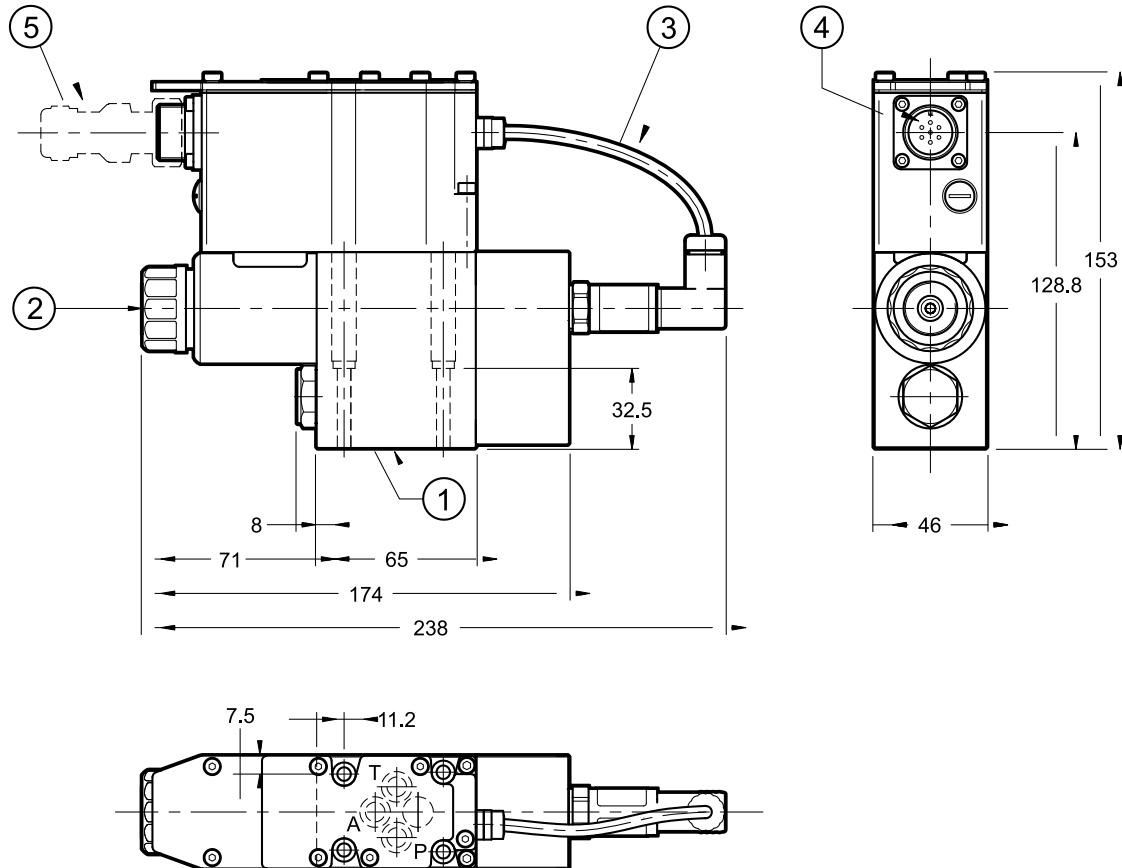
(obtained with mineral oil with viscosity of 36 cSt at 50°C)

The response time is affected by both the flow rate and the oil volume in the pipework.



8 - PZE3J - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



NOTE: at the first start up, or after a long period of no use, it is necessary to vent the air through the breather (2) placed at the end of the solenoid tube.

Fastening bolts: 4 SHC screws M5x40 - ISO 4762

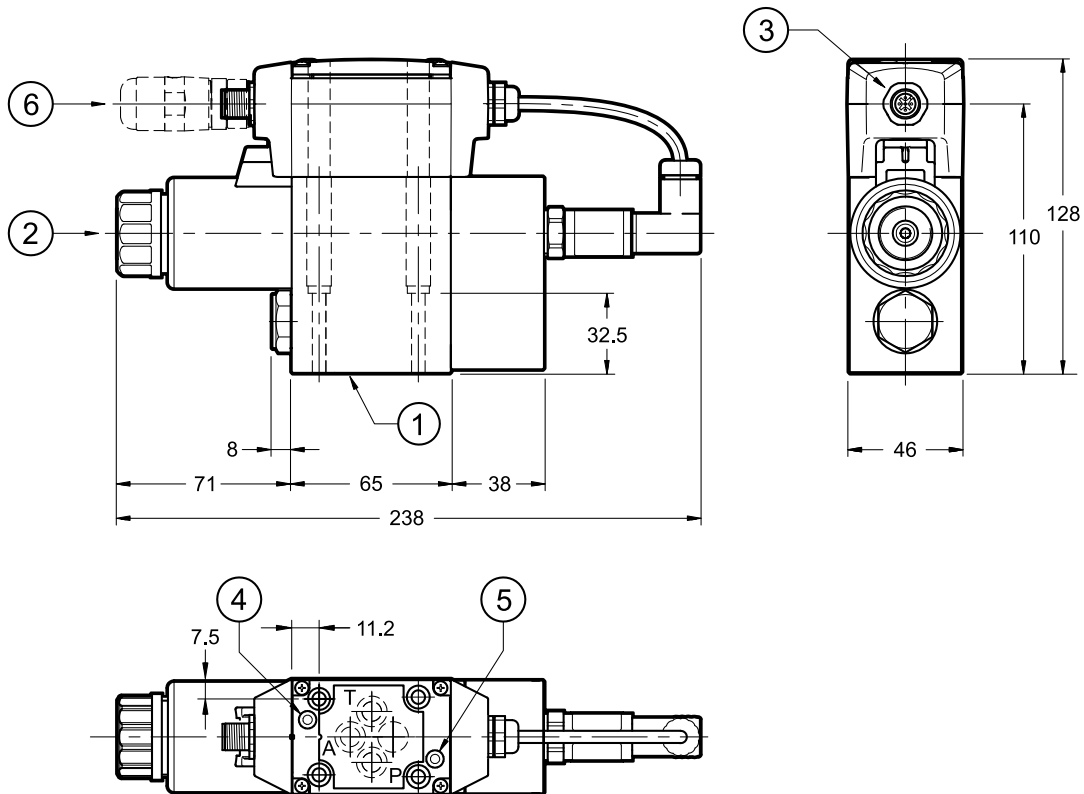
Torque: 5 Nm (A8.8)

Threads of mounting holes: M5x10

| | |
|---|---|
| 1 | Mounting surface with sealing rings: 4 OR type 2037 (9.25 x 1.78) - 90 shore |
| 2 | Breather: Allen key 4 |
| 3 | Cable with connector for pressure transducer |
| 4 | Main connection |
| 5 | Mating connector 6 poles + PE , female type MIL-5015-G To be ordered separately. See catalogue 89 000 0 |

9 - PZE3JL - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



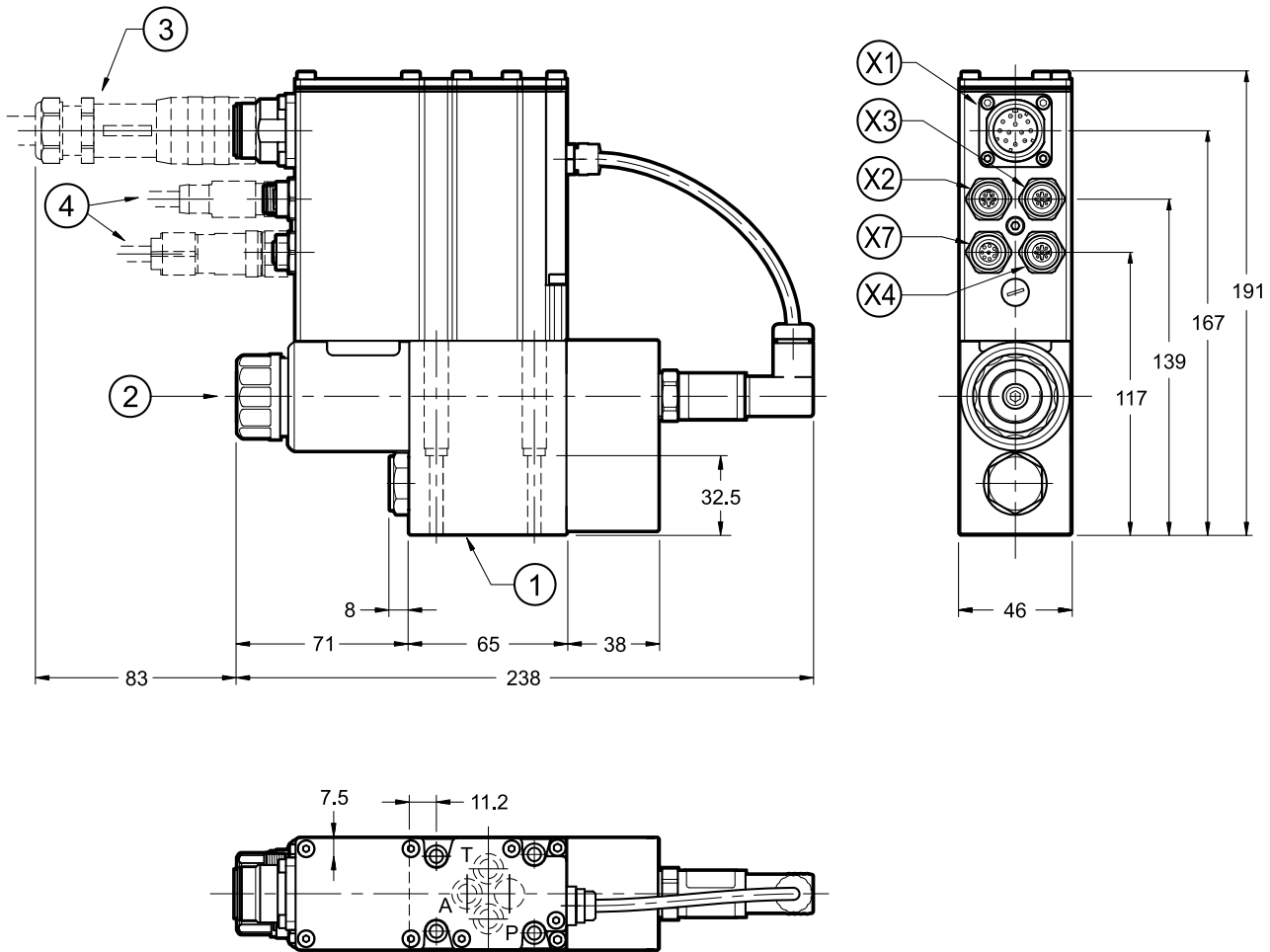
NOTE: at the first start up, or after a long period of no use, it is necessary to vent the air through the breather (2) placed at the end of the solenoid tube.

| |
|--|
| Fastening bolts: 4 SHC screws M5x40 - ISO 4762 |
| Torque: 5 Nm (A8.8) |
| Threads of mounting holes: M5x10 |

| | |
|---|---|
| 1 | Mounting surface with sealing rings: N. 4 OR type 2037 (9.25x1.78) 90 Shore |
| 2 | Breather: Allen key 4 |
| 3 | Connection M12 A 5 pin |
| 4 | L1 LED |
| 5 | L2 LED |
| 6 | Mating connector M12 5 poles - code A, female To be ordered separately. See catalogue 89 000 |

10 - PZE3JH - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



| | |
|----|---------------------------------------|
| X1 | Main connection 11 pin + PE |
| X2 | Fieldbus communication (IN) |
| X3 | Fieldbus communication (OUT) |
| X4 | X4 connection for analogue transducer |
| X7 | X7 connection for digital transducer |

| | |
|---|---|
| 1 | Mounting surface with sealing rings: N. 4 OR type 2037 (9.25x1.78) 90 Shore |
| 2 | Breather: Allen key 4 |
| 3 | Mating connector 11 poles + PE To be ordered separately. See catalogue 89 000 |
| 4 | Mating connectors for fieldbus communication and signals To be ordered separately. See catalogue 89 000 |

NOTE 1: Depending on the chosen version, X4 and X7 connections may not be present.
Please refer to section 5 for connection descriptions and pinout.

NOTE 2: at the first start up, or after a long period of no use, it is necessary to vent the air through the breather (2) placed at the end of the solenoid tube.

Fastening bolts: 4 SHC screws M5x40
ISO 4762

Torque: 5 Nm (A8.8)

Threads of mounting holes: M5x10

11 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid 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.

12 - INSTALLATION

We recommend installing these valves with the solenoid downward, either in horizontal or vertical position. If the valve is installed on vertical axis with the solenoid upward, you should consider possible variations of the minimum controlled pressure from those indicated in point 5.

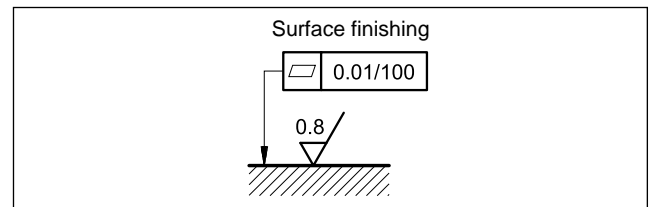
Ensure that there is no air in the hydraulic circuit. In certain applications it might be necessary to vent the air entrapped in the solenoid tube by unfastening the drain screw placed in the solenoid tube.

Ensure the solenoid tube is always filled with oil. Make sure the drain screw has been put back correctly at the end of the task. Connect the valve T port directly to the tank.

Add any backpressure value detected in the T line to the controlled pressure value. Maximum admissible backpressure in the T line, under operational conditions, is 2 bar.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols.

If minimum values are not observed, fluid can easily leaks between the valve and support surface.



13 - ACCESSORIES

(to be ordered separately)

13.1 - Mating connectors

Mating connectors must be ordered separately. See catalogue 89 000.



For K11 and K16 versions we recommend the choice of a metal connector to avoid electromagnetic disturbances and to comply with EMC regulations on electromagnetic compatibility. If you opt for a plastic connector, make sure that it guarantees and maintains the IP and EMC protection characteristics of the valve.

13.2 - Mating connectors and caps for fieldbus communication and for sensors.

Duplomatic offers spare parts to be wired and also ready-to-use cord sets. Please refer to cat. 89 000.

13.3 - Connection cable

The optimal wiring provides for 7 isolated conductors, with separate screen for the signal wires (command, monitor) and an overall screen.

Cross section for power supply:

- up to 20 m cable length : 1,0 mm²
- up to 40 m cable length : 1,5 mm² (IO-Link excluded)

Cross section for signals (command, monitor):

- 0,50 mm²

13.4 - Kit for start-up LINPC-USB

Device for service start-up and diagnostic. See catalogue 89 850.

14 - SUBPLATES

(see catalogue 51 000)

| |
|--|
| PMMD-AI3G with ports on rear |
| PMMD-AL3G with side ports |
| Ports dimensions P, T, A, B: 3/8" BSP thread |



PZE3J*

DUPLOMATIC
MOTION SOLUTIONS
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