

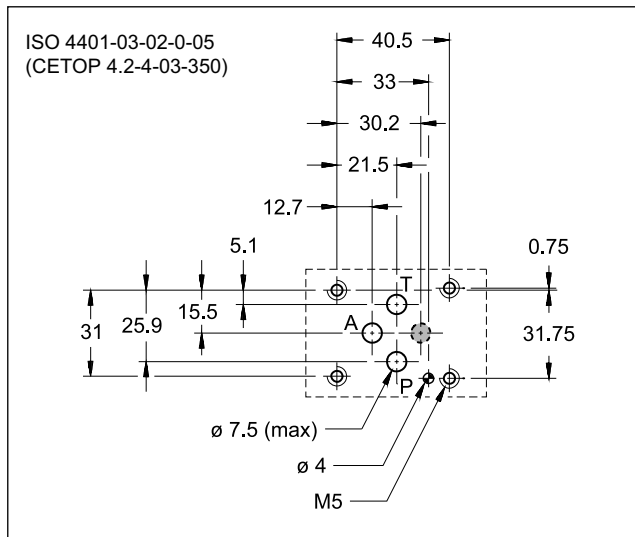
PZE3J*

PROPORTIONAL 3-WAY PRESSURE REDUCING VALVE, WITH PRESSURE CLOSED LOOP AND INTEGRATED ELECTRONICS

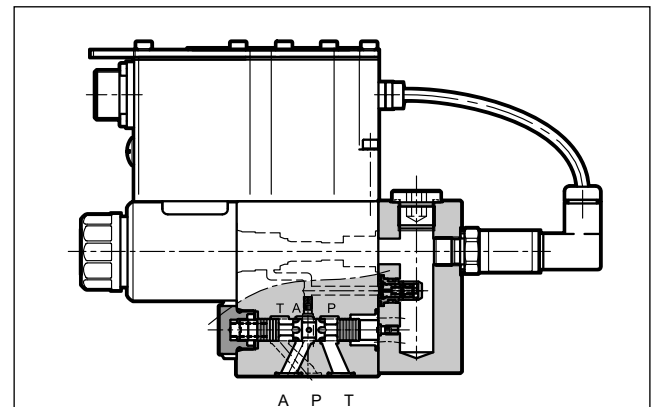
**SUBPLATE MOUNTING
ISO 4401-03**

**p max 350 bar
Q max 40 l/min**

MOUNTING SURFACE



OPERATING PRINCIPLE



- PZE3J* valve is a proportional 3-way 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)

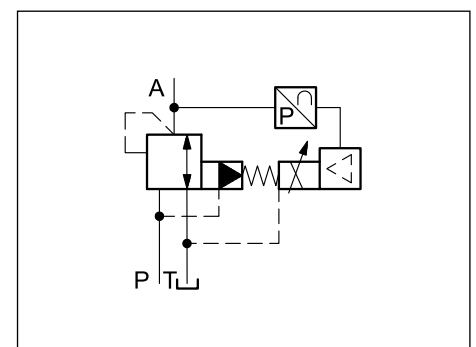
PERFORMANCES

(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 paragraph 7	
Hysteresis	% of p nom	< 1 %
Repeatability	% of p nom	< ± 0.5%
Electrical characteristic	see paragraph 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.

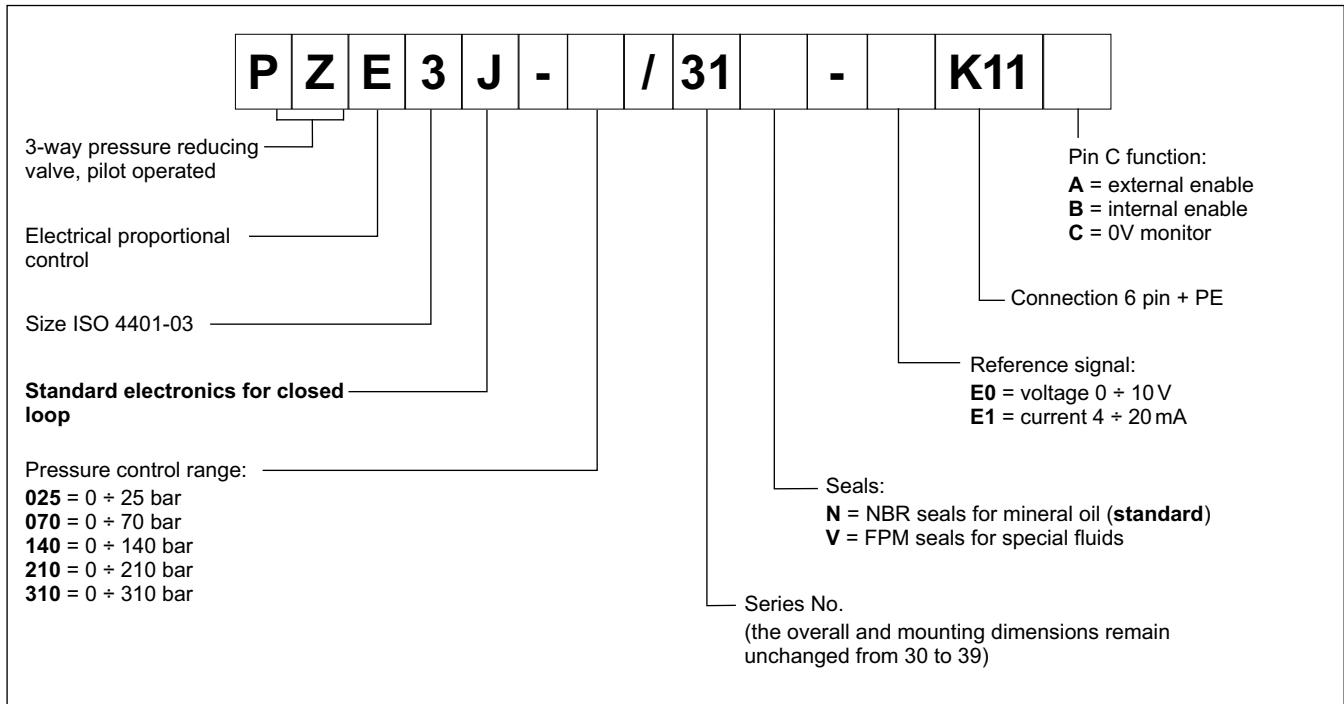
HYDRAULIC SYMBOL



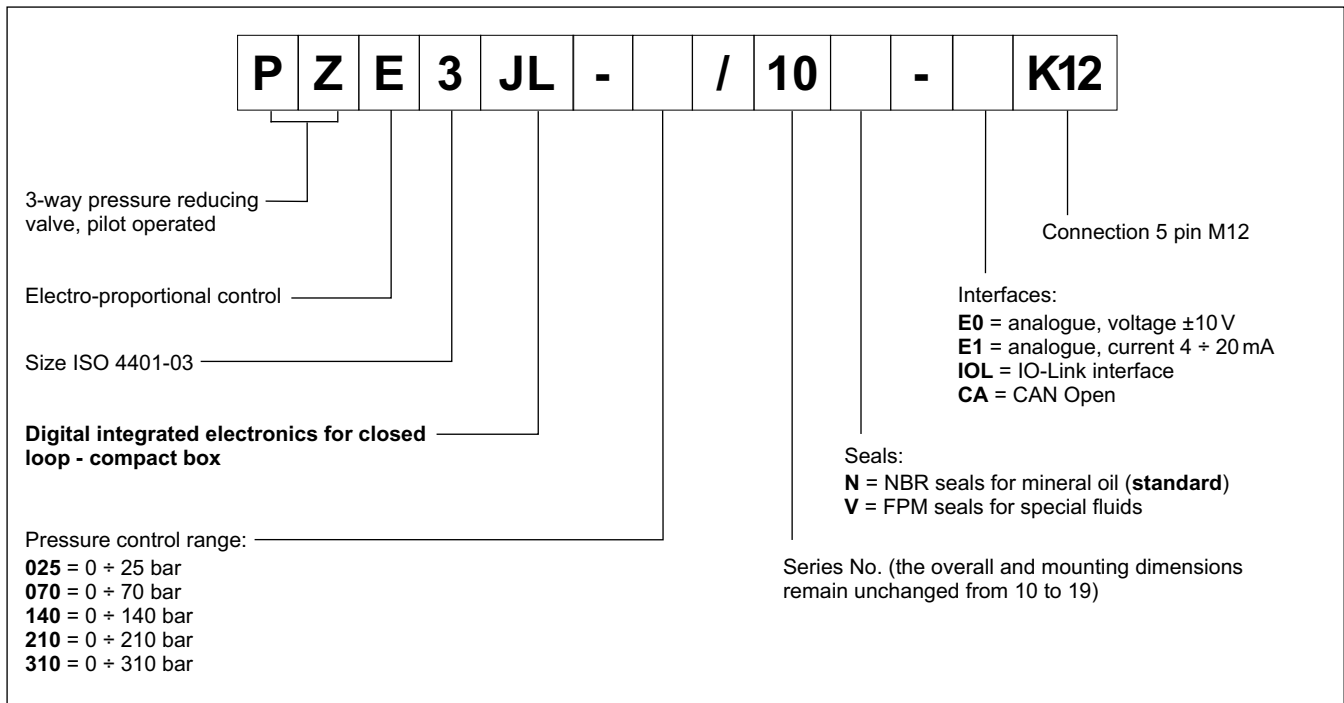


1 - IDENTIFICATION CODE

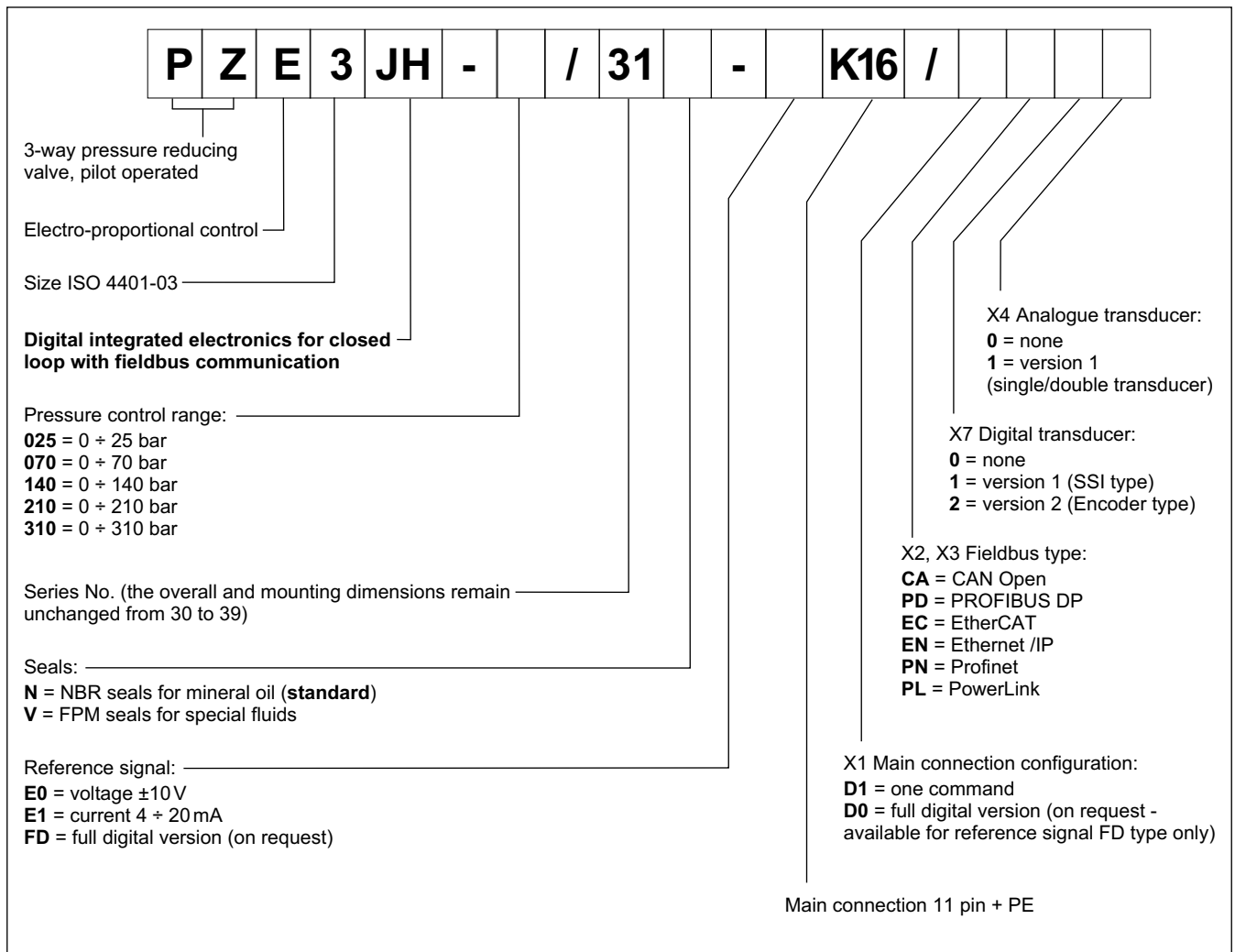
1.1 - Standard electronics



1.2 - Compact electronics



1.3 - Electronics with fieldbus communication



2 - ELECTRONICS COMMON DATA

Duty cycle		100% (continuous operation)
Protection class according to EN 60529		IP65 / IP67
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

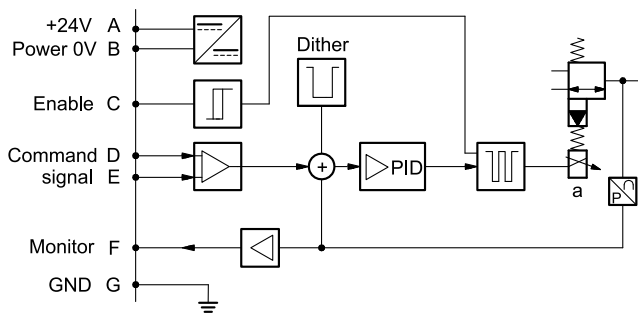
3 - PZE3J - STANDARD ELECTRONICS

3.1 - Electrical characteristics

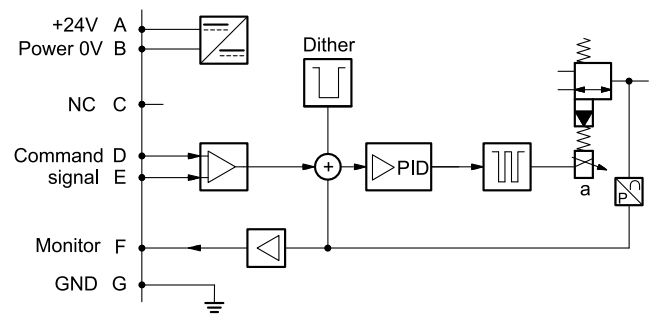
Command signal:	voltage (E0) current (E1)	V DC mA	0 ÷ 10 (Impedance Ri = 11 kOhm) 4 ÷ 20 (Impedance Ri = 58 Ohm)
Monitor signal (pressure at transducer):	voltage (E0) current (E1)	V DC mA	0 ÷ 10 (Impedance Ro > 1 kOhm) 4 ÷ 20 (Impedance Ro = 500 Ohm)
Communication for diagnostic			LIN-bus Interface (by means of the optional kit)
Connection			6 pin + PE (MIL-C-5015-G - DIN EN 175201-804)

3.2 - On-board electronics diagrams

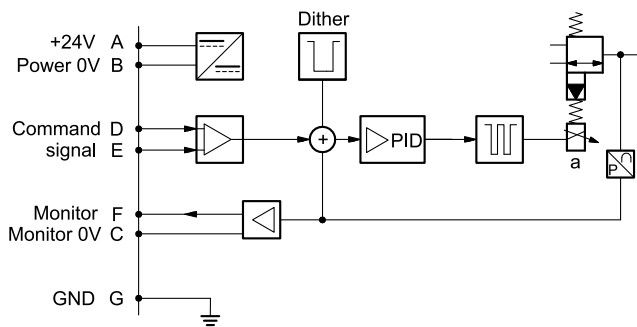
VERSION A - External Enable



VERSION B - Internal Enable

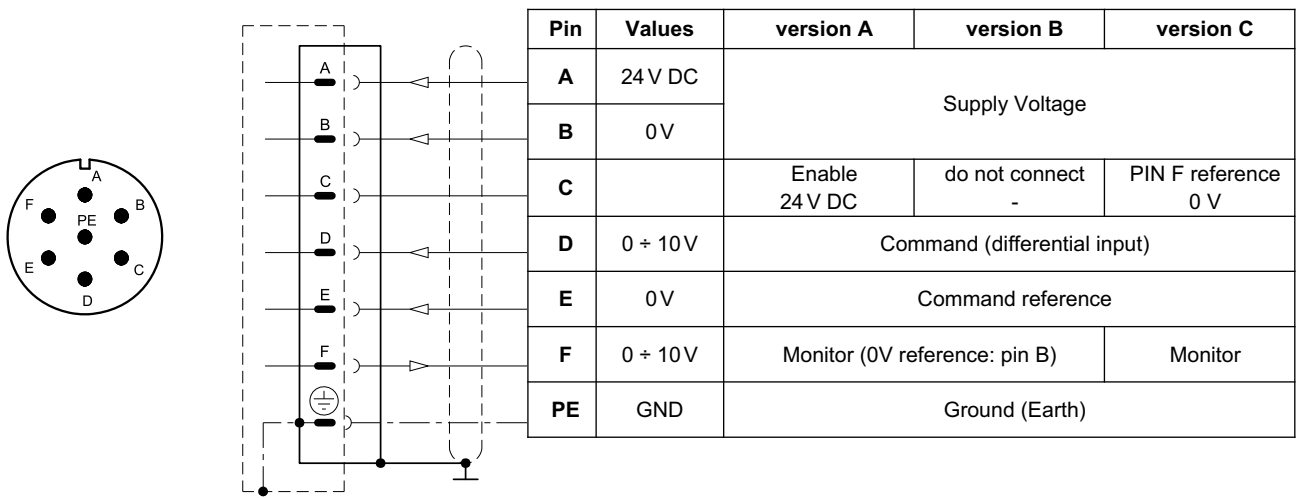
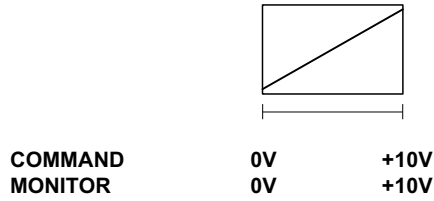


VERSION C - 0V Monitor



3.3 - Versions with voltage command (E0)

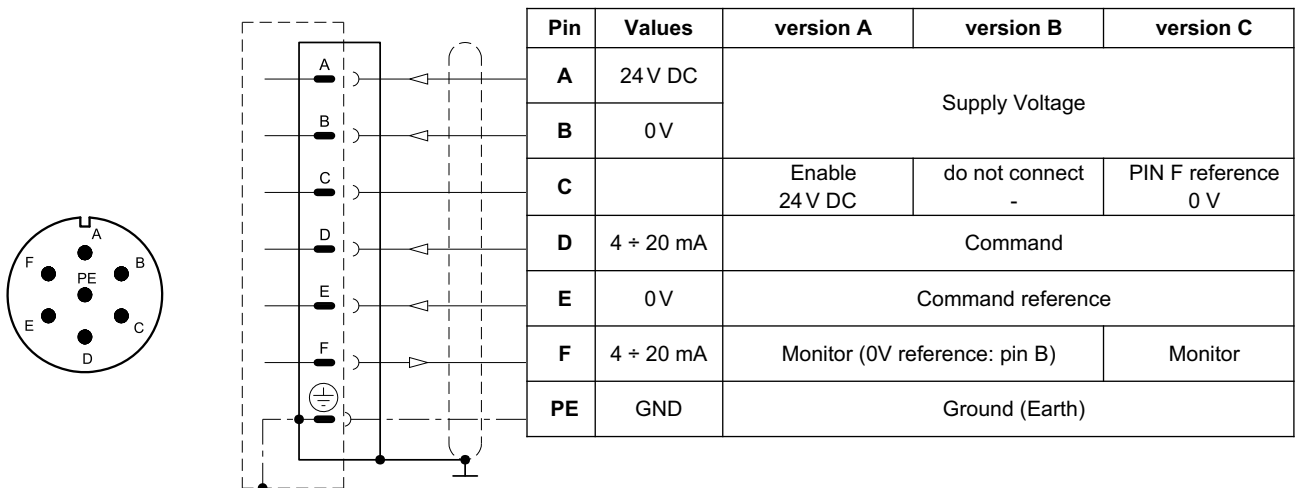
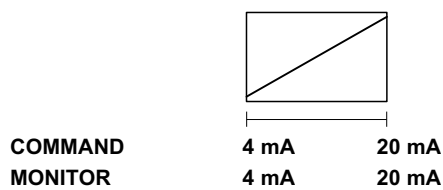
The reference signal is between $0 \div 10V$. The monitor feature of versions B and C becomes available with a delay of 0,5 sec from the power-on of the card.



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.



4 - PZE3JL - COMPACT ELECTRONICS

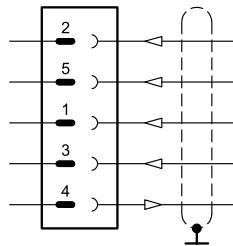
In versions 'IOL' and 'CA' pin 3 and pin 5 are galvanic isolated up to 100 V to avoid earth loops. In IO-Link networks, the length of the connecting cables is limited to 20 metres.

4.1 - Electrical characteristics

Command signal: voltage (E0) current (E1)	V DC mA	0 ÷ 10 (Impedance Ri = 11 kOhm) 4 ÷ 20 (Impedance Ri = 58 Ohm)
Monitor signal (pressure at transducer): voltage (E0) current (E1)	V DC mA	0 ÷ 5 (Impedance Ro > 1 kOhm) 4 ÷ 20 (Impedance Ro = 500 Ohm)
IO-Link communication (IOL): Data rate	kBaud	IO-Link Port Class B 230.4
Can Open communication (CA): Data rate	kbit	10 ÷ 1000
Data register (IOL and CA versions only)		solenoid voltage supply, solenoid faults (shortcircuit, bad config, internal), box temperature, switch-on time, vibrations
Connection		5-pin M12 code A (IEC 61076-2-101)

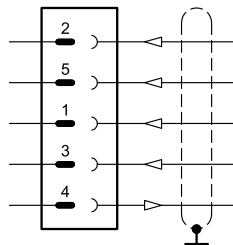
4.2 - Pin tables

'E0' connection



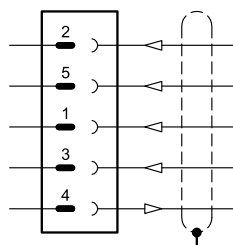
Pin	Values	Function
2	24 V DC	Supply voltage (solenoid and logic)
5	0 V	
1	0 ÷ 10 V	Command
3	0 V	Command reference
4	0 ÷ 5 V	Monitor (0V reference: pin 5)

'E1' connection



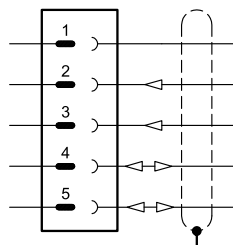
Pin	Values	Function
2	24 V DC	Supply voltage (solenoid and logic)
5	0 V	
1	4 ÷ 20 mA	Command
3	0 V	Command reference
4	4 ÷ 20 mA	Monitor (0V reference: pin 5)

'IOL' connection



Pin	Values	Function
2	2L+ 24 V DC	Supply of the power stage
5	2L- 0 V (GND)	Internal galvanic isolation from PIN 3
1	1L+ +24 V DC	IO-Link supply voltage
3	1L- 0 V (GND)	
4	C/Q	IO-Link Communication

'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 solenoids.

Command - valve position schemes as for the standard electronics. Please refer to pictures in par. 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 standards CAN Open PROFIBUS DP EtherCAT, Ethernet /IP, Profinet, PowerLink		EN 50325-4+DS408 EN 50170-2 / IEC 61158 IEC 61158
Communication physical layer CAN Open PROFIBUS DP EtherCAT, Ethernet /IP, Profinet, PowerLink		optical insulated CAN ISO 11898 optical insulated RS485 fast ethernet, insulated 100 Base TX
Power connection		11 pin + PE (DIN 43651)

5.2 - X1 Main connection pin table

D1: one command			D0: full digital		
Pin	Values	Function	Pin	Values	Function
1	24V DC	Main supply voltage	1	24V DC	Main supply voltage
2	0V		2	0V	
3	24V DC	Enable	3	24V DC	Enable
4	0 ÷ 10V (E0) 4 ÷ 20 (E1)	Command	4	NC	do not connect
5	0V	Command reference signal	5	NC	do not connect
6	0 ÷ 10V (E0) 4 ÷ 20 (E1)	Monitor (0V reference pin 10)	6	NC	do not connect
7	NC	do not connect	7	NC	do not connect
8	NC	do not connect	8	NC	do not connect
9	24V DC	Logic and control supply	9	24V DC	Logic and control supply
10	0V		10	0V	
11	24V DC	Fault (0V DC) or normal working (24V DC) (0V reference pin 2)	11	24V DC	Fault (0V DC) or normal working (24V DC) (0V reference pin 2)
12	GND	Ground (Earth)	12	GND	Ground (Earth)

5.3 - FIELDBUS connections

Please wire following guidelines provided by the relative standards communication protocol.

5.3.1 - Communication connection CA (CAN Open)

X2 (IN) connection: M12 A 5 pin female



Pin	Values	Function
1	CAN_SH	Shield
2	NC	Do not connect
3	GND	Signal zero for data line
4	CAN_H	Bus line (high)
5	CAN_L	Bus line (low)

X3 (OUT) connection: M12 A 5 pin male



Pin	Values	Function
1	CAN_SH	Shield
2	NC	Do not connect
3	GND	Signal zero for data line
4	CAN_H	Bus line (high)
5	CAN_L	Bus line (low)

5.3.2 - Communication connection PD (PROFIBUS DP)

X2 (IN) connection: M12 B 5 pin male (IN)



Pin	Values	Function
1	+5 V	Termination signal supply
2	PB_A	Bus line (high)
3	0V	Signal zero for data line and termination
4	PB_B	Bus line (low)
5	SHIELD	

X3 (OUT) connection: M12 B 5 pin female



Pin	Values	Function
1	+5 V	Termination signal supply
2	PB_A	Bus line (high)
3	0V	Signal zero for data line and termination
4	PB_B	Bus line (low)
5	SHIELD	

5.3.3 - Communication connections: EC (EtherCat), EN (Ethernet/IP), PN (PROFINET), PL (POWERLINK)

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

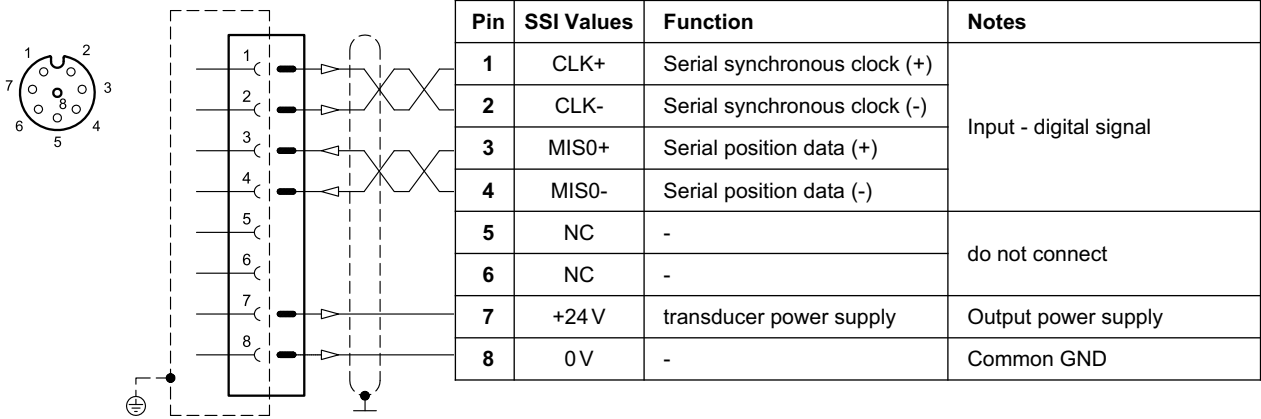


Pin	Values	Function
1	TX+	Transmitter
2	RX+	Receiver
3	TX-	Transmitter
4	RX-	Receiver
HOUSING	shield	

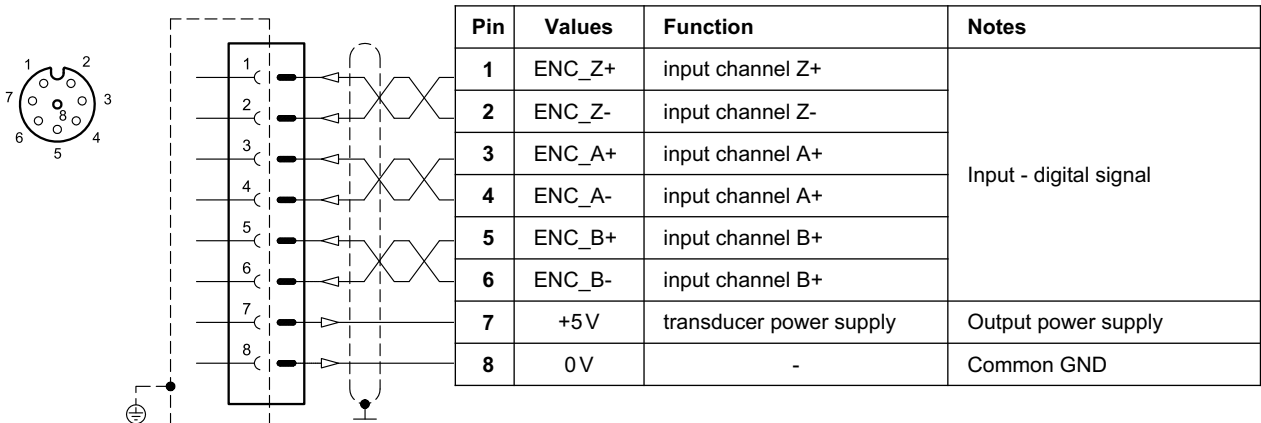
5.4 - Digital transducer connection

X7 connection: M12 A 8 pin female

VERSION 1: SSI type



VERSION 2: ENCODER type

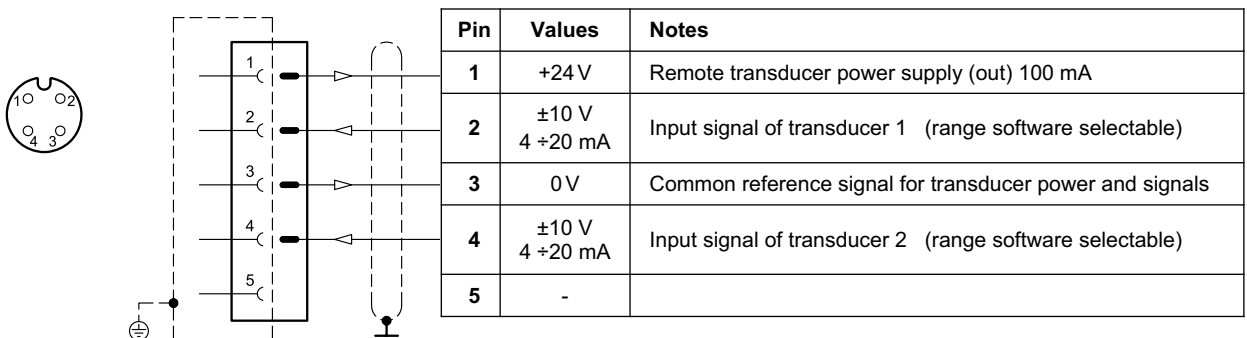


5.5 - Analogue transducer connection

X4 connection: M12 A 4 pin female

VERSION 1: single / double transducer

(single or double is a software-selectable option)

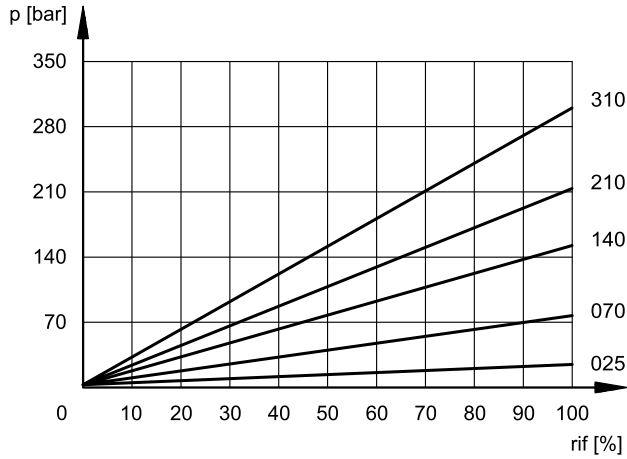


6 - CHARACTERISTIC CURVES

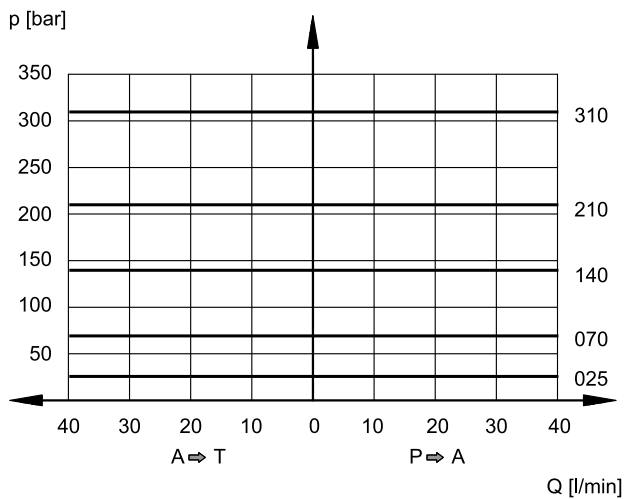
(measured with viscosity of 36 cSt at 50°C)

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.

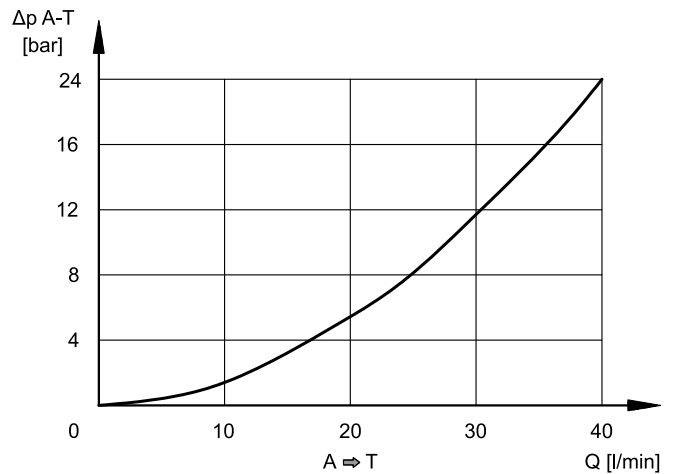
PRESSURE CONTROL $p = f(I)$



SET PRESSURE $p_{max} = f(Q)$



MIN CONTROLLED PRESSURE $p_{min} = f(Q)$

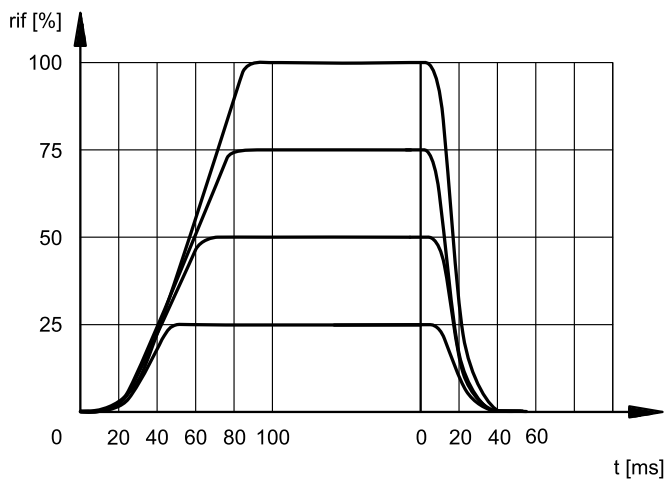


Pressure drops A → T vs. flow, without backpressure in T port and reference signal = 0 %

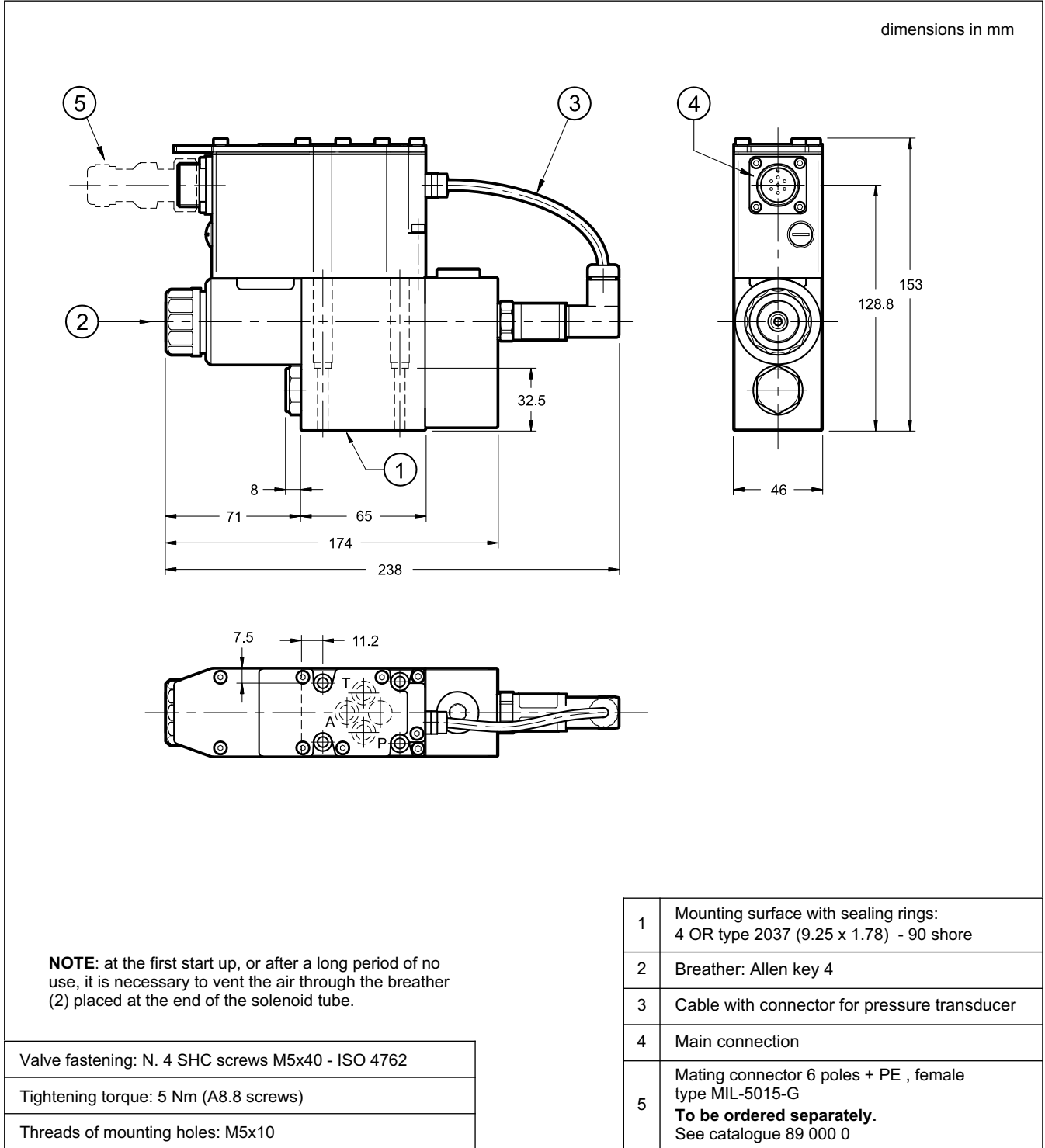
7 - RESPONSE TIMES

(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.

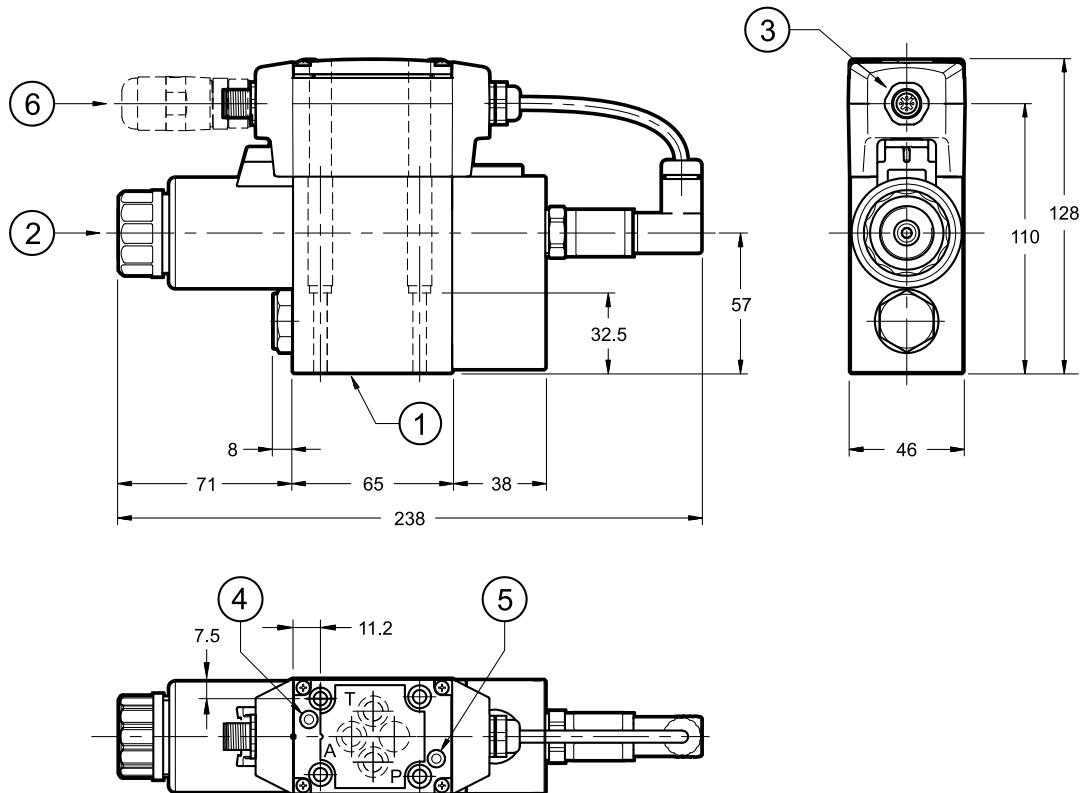


8 - PZE3J - OVERALL AND MOUNTING DIMENSIONS



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.

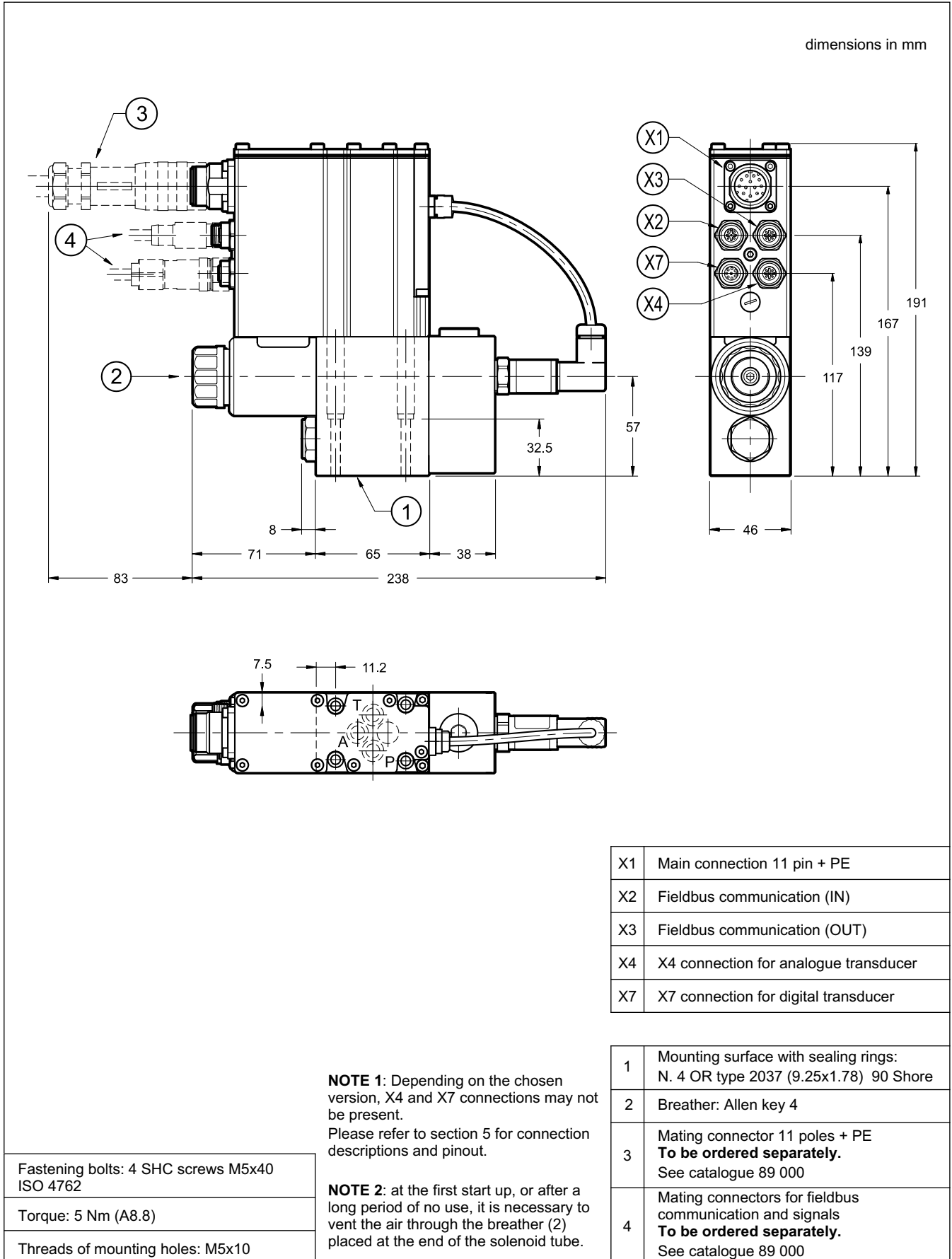
Fastening bolts: 4 SHC screws M5x40 - ISO 4762

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



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 paragraph 5.

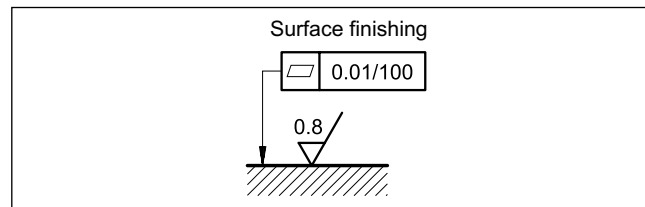
Ensure that there is no air in the hydraulic circuit. In certain applications it might be necessary to vent the air entrapped in the solenoid tube by unfastening the drain screw placed in the solenoid tube.

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 for fieldbus communication and for sensors.

Diplomatic 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, available for valves with K11 and K16 connection, 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