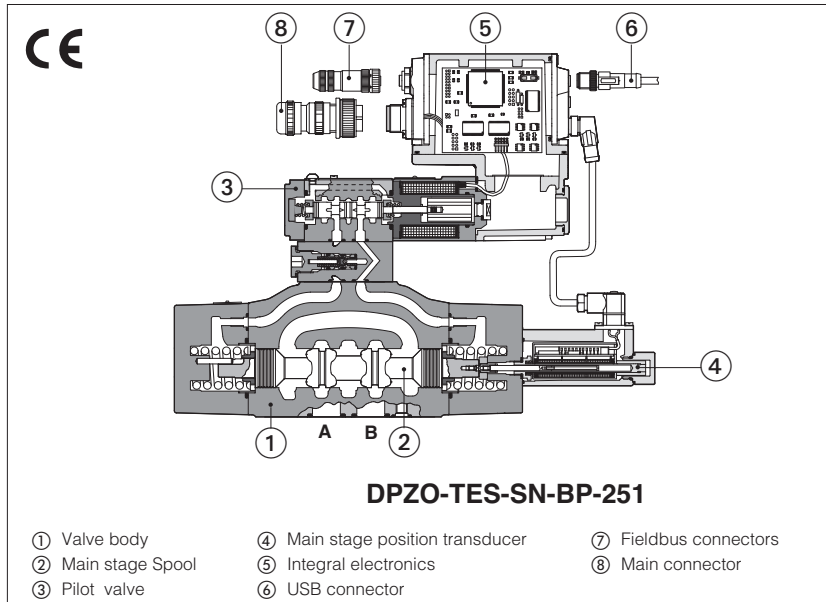


# Two stage proportional directional valves

digital, with position transducer and **positive spool overlap**



### DPZO-TEB, DPZO-TES

Two stage digital proportional valves specifically designed for directional and speed controls.

They are equipped with main stage LVDT position transducer and positive spool overlap for best dynamics in directional controls and not compensated flow regulations.

The integral digital electronic driver performs the valve's hydraulic regulation according to the reference signal and assures valve-to-valve interchangeability thanks to the factory presetting.

The valves are available in TEB basic execution with analog reference signals and USB port for software functional parameters setting or in TES full execution which includes also optional fieldbus interfaces for functional parameters setting, reference signals and real-time diagnostics.

Size: **10 to 32**

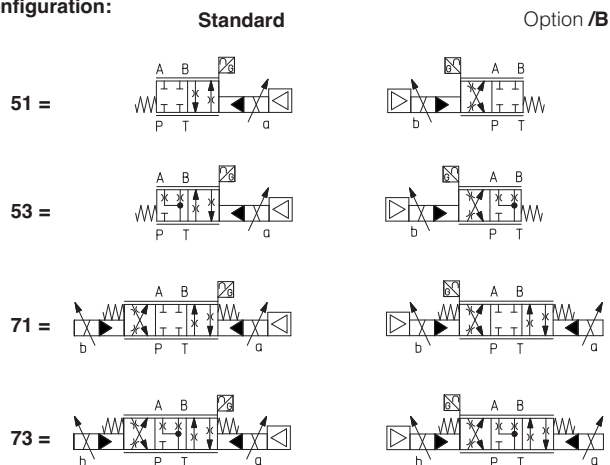
Max flow: **180 to 1600 l/min**

Max pressure: **350 bar**

### 1 MODEL CODE for STANDARD SPOOLS

<b>DPZO</b>	-	<b>T</b>	-	<b>ES</b>	-	<b>SN</b>	-	<b>NP</b>	-	<b>2</b>	-	<b>71</b>	-	<b>L</b>	-	<b>5</b>	/	<b>*</b>	/	<b>*</b>	/	<b>*</b>
<p>Two stage proportional directional valve</p> <p><b>T</b> = closed-loop one LVDT transducer</p> <p><b>Integral digital drivers:</b>  <b>EB</b> = basic (1)  <b>ES</b> = full</p> <p><b>Alternated P/Q controls</b>  <b>SN</b> = none</p> <p><b>Fieldbus interfaces</b> USB port always present:  <b>NP</b> = Not present (1)    <b>EW</b> = POWERLINK  <b>BC</b> = CANopen            <b>EH</b> = EtherCAT  <b>BP</b> = PROFIBUS DP      <b>EI</b> = EtherNet/IP</p> <p><b>Valve size</b> ISO 4401:  <b>1</b> = 10    <b>2</b> = 16    <b>4</b> = 25    <b>6</b> = 32</p>																						
<p>Seals material, see sect. 5, 6:          - = NBR  <b>PE</b> = FKM  <b>BT</b> = HNBR</p> <p>Series number</p> <p><b>Hydraulic options</b>, see section 9:  <b>B</b> = solenoid with integral electronics and position transducer at side of port A of the main stage (side B of pilot valve) (2)  <b>D</b> = internal drain  <b>E</b> = external pilot (through port X)</p> <p><b>Electronic options</b>, see sections 11  <b>I</b> = current reference input and monitor 4÷20 mA (omit for standard voltage reference input and monitor ±10 V)  <b>F</b> = fault signal  <b>Q</b> = enable signal  <b>Z</b> = double power supply (3), enable, fault and monitor signals (12 pin connector)</p>																						

### Configuration:

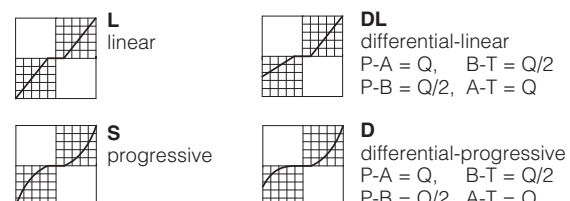


### Spool size 3 (L,S,D) 5 (L,DL,S,D) 5 (L,S,D)

DPZO-1 =	-	100	-
DPZO-2 =	160	250	-
DPZO-4 =	-	480	-
DPZO-6 =	-	-	640

Nominal flow (l/min) at Δp 10 bar P-T

### Spool type - regulating characteristics:



(1) TEB is available only in version SN-NP

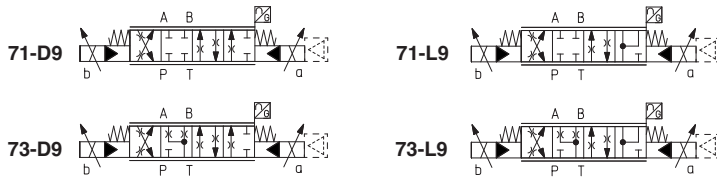
(2) In standard configuration the solenoid with integral electronics and position transducer are at side B of the main stage (side A of pilot valve)

(3) double power supply only for TES

**2 MODEL CODE for SPECIAL SPOOLS** - refer to section 1 for valve model code and options

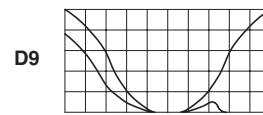
**DPZO** - **T** **ES** - **SN** - **NP** - **2** **71-L9** / \* / \* / \*

**Configuration, spool type and size:**

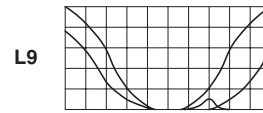


<b>Spool size</b>	<b>D9</b>	<b>L9</b>	<b>Spool size</b>	<b>D9</b>	<b>L9</b>
DPZO-1 =	100	-	DPZO-4 =	480	-
DPZO-2 =	250	250			

Nominal flow (l/min) at  $\Delta p$  10bar P-T



For regenerative circuit (additional external check valve required) see section 8, diagram 23



For regenerative circuit internal to the valve see section 8, diagram 24

**3 GENERAL NOTES**

DPZO-TEB, TES proportional valves are CE marked according to the applicable Directives (e.g. Immunity/Emission EMC Directive and Low Voltage Directive). Installation, wirings and start-up procedures must be performed according to the general prescriptions shown in table F003 and in the installation notes supplied with relevant components. The electrical signals of the valve (e.g. monitor signals) must not be directly used to activate safety functions, or components, as prescribed by the European standards (Safety requirements of fluid technology systems and components-hydraulics, EN-982).



**WARNING**

To avoid overheating and possible damage of the electronic driver, the valves must be never energized without hydraulic supply to the pilot stage. In case of prolonged pauses of the valve operation during the machine cycle, it is always advisable to disable the driver (option /Q or /Z). A safety fuse 2,5 A installed on 24Vdc power supply of each valve is always recommended, see also Power supply note at sections 11

**4 FIELDBUS** - only for **TES**

Fieldbus allows the direct communication of the proportional valve with machine control unit for digital reference signal, diagnostics and settings of functional parameters. Analog reference signal remain available on the main connector for quick commissioning and maintenance. For detailed information about fieldbus features and specification see tech table **GS510**.

**5 MAIN CHARACTERISTICS** - based on mineral oil ISO VG 46 at 50 °C

Assembly position	Any position			
Subplate surface finishing	Roughness index, Ra 0,4 flatness ratio 0,01/100 (ISO 1101)			
MTTFd values according to EN ISO 13849	75 years, see technical table P007			
Ambient temperature range	<b>standard</b> = -20°C ÷ +60°C		/BT option = -40°C ÷ +60°C	
Storage temperature range	<b>standard</b> = -20°C ÷ +70°C		/BT option = -40°C ÷ +70°C	
Coil resistance R at 20°C	3 ÷ 3,3 Ω			
Max. solenoid current	2,6 A			
Max. power	50 Watt			
Insulation class	H (180°) Due to the occurring surface temperatures of the solenoid coils, the European standards ISO 13732-1 and EN982 must be taken into account			
Protection degree to DIN EN60529	IP66/67 with mating connector			
Tropicalization	Tropical coating on electronics PCB			
Duty factor	Continuous rating (ED=100%)			
EMC, climate and mechanical load	See technical table G004			
Communication interface	USB Atos ASCII coding	CANopen EN50325-4 + DS408	PROFIBUS DP EN50170-2/IEC61158	EtherCAT, POWERLINK EtherNet/IP IEC 61158
Communication physical layer	not insulated USB 2.0 + USB OTG	optical insulated CAN ISO11898	optical insulated RS485	Fast Ethernet, insulated 100 Base TX

Valve model	DPZO*-1	DPZO*-2	DPZO*-4	DPZO*-6		
Pressure limits [bar]	ports <b>P, A, B, X</b> = 350; <b>T</b> = 250 (10 for option /D); <b>Y</b> = 10;					
Spool type	standard <b>L5, DL5, S5, D5</b>	<b>L3, S3, D3</b>	<b>L5, DL5, S5, D5</b>	<b>L5, S5, D5</b>		
Nominal flow (1) [l/min]						
$\Delta p$ P-T	$\Delta p = 10$ bar	100	160	250	480	640
	$\Delta p = 30$ bar	160	270	430	830	1100
	Max permissible flow	180	400	550	1000	1600
Piloting pressure [bar]	min. = 25; max = 350					
Piloting volume [cm³]	1,4	3,7	9,0	21,6		
Piloting flow (2) [l/min]	1,7	3,7	6,8	14,4		
Leakage (3)	Pilot [cm³]	100/300	100/300	200/500	900/2800	
	Main stage [l/min]	0,15/0,5	0,2/0,6	0,3/1,0	1,0/3,0	
Response time (0-100% step signal) (4) [bar]	< 60	< 75	< 80	< 120		
Hysteresis	≤ 0,1 [% of max regulation]					
Repeatability	± 0,1 [% of max regulation]					
Thermal drift	zero point displacement < 1% at $\Delta T = 40^\circ C$					

**Notes:**

above performance data refer to valves coupled with Atos electronic drivers, see section 8.

(1) for different  $\Delta p$ , see section 9.2 (2) with step reference input signal 0 ÷ 100 % (3) at p = 100/350 bar (4) see detailed diagrams in section 8.3

**6 SEALS AND HYDRAULIC FLUID** - for other fluids not included in below table, consult our technical office

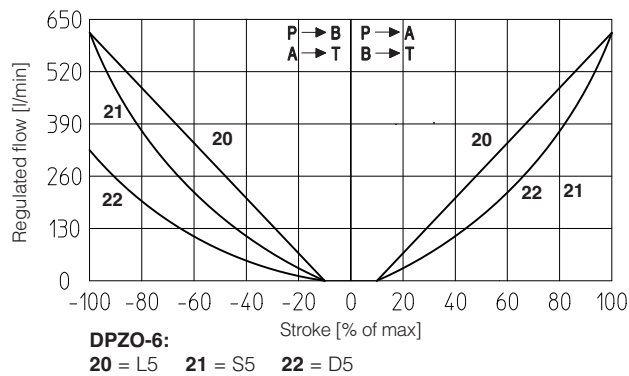
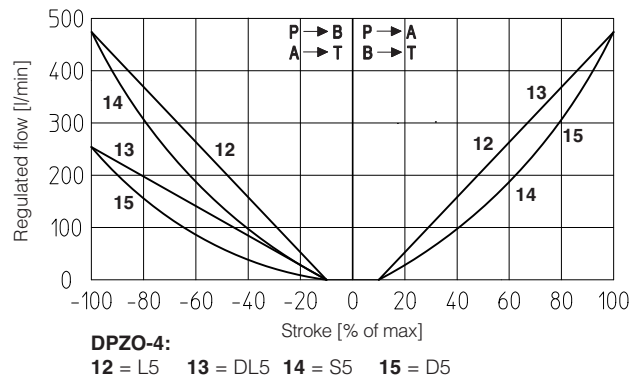
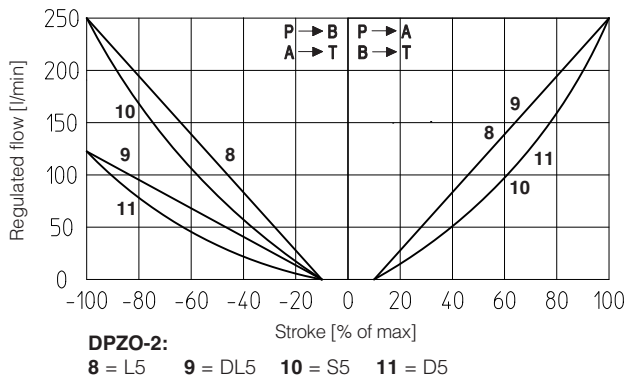
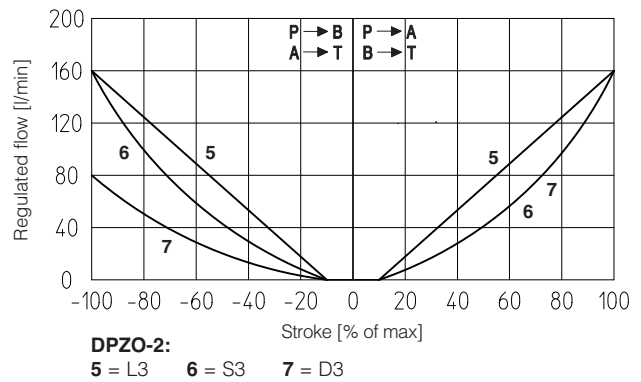
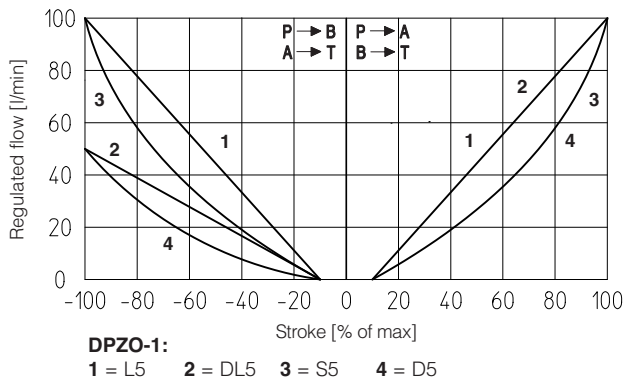
Seals, recommended fluid temperature	NBR seals (standard) = -20°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C HNBR seals (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C		
Recommended viscosity	20 ÷ 100 mm <sup>2</sup> /s - max allowed range 15 ÷ 380 mm <sup>2</sup> /s		
Fluid contamination class	ISO 4406 class 20/18/15 NAS 1638 class 9, in line filters of 10 µm (β <sub>10</sub> ≥ 75 recommended)		
<b>Hydraulic fluid</b>	<b>Suitable seals type</b>	<b>Classification</b>	<b>Ref. Standard</b>
Mineral oils	NBR, FKM, HNBR	HL, HLP, HLPD, HVLP, HVLDP	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR, HNBR	HFC	

**7 ELECTRONIC DRIVERS** - for main and communication connector see sections 12, 13

Valve model	<b>TEB</b>	<b>TES</b>
Drivers model	E-RI-TEB-N	E-RI-TES-N
Type	Digital	
Format	Integral to valve	
Data sheet	GS208	GS210

**8 DIAGRAMS** (based on mineral oil ISO VG 46 at 50 °C)

**8.1 Regulation diagrams** (values measure at Δp 10 bar P-T)



**Note:**

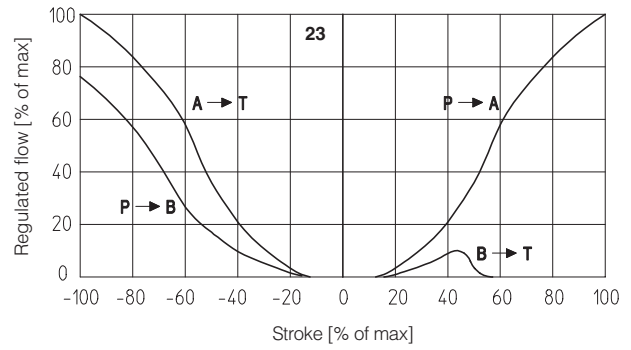
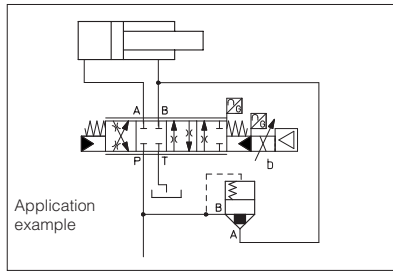
Hydraulic configuration vs. reference signal (standard and option /B)

Reference signal  $\left. \begin{matrix} 0 \div +10 \text{ V} \\ 12 \div 20 \text{ mA} \end{matrix} \right\} P \rightarrow A / B \rightarrow T$

Reference signal  $\left. \begin{matrix} 0 \div -10 \text{ V} \\ 12 \div 4 \text{ mA} \end{matrix} \right\} P \rightarrow B / A \rightarrow T$

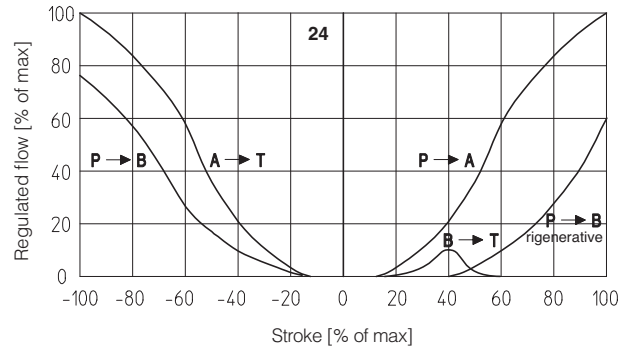
**23** = differential - regenerative spool **D9**  
(not available for valve size 32 and 35)

D9 spool type with a fourth position specific to regenerative circuit, performed by means of an additional external check valve.



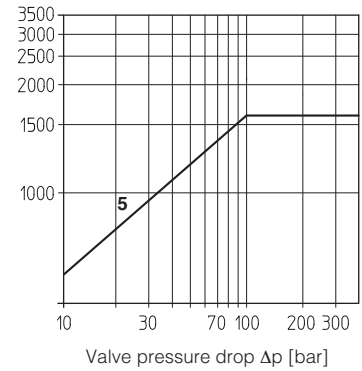
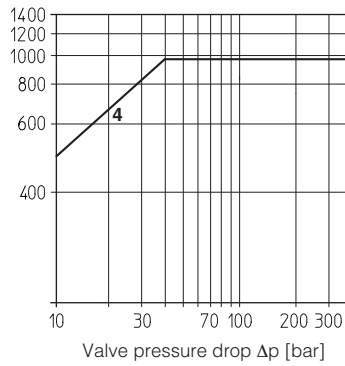
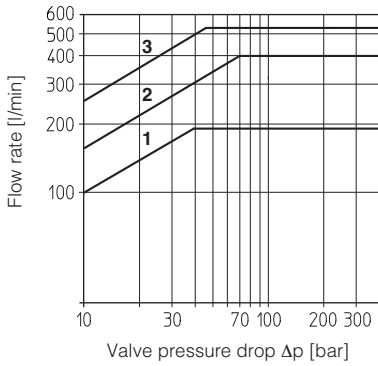
**24** = linear - internal regenerative spool **L9**  
(available only for valve size 16)

L9 spool type with a fourth position specific to perform a regenerative circuit internal to the valve.



### 8.2 Operating diagrams

**Flow /Δp diagram** stated at 100% of spool stroke



**DPZO-1:**

**1** = spools L5, S5, D5, DL5, D9

**DPZO-2:**

**2** = spools L3, S3, D3

**3** = spools L5, S5, D5, DL5, D9, L9

**DPZO-4:**

**4** = spools L5, S5, D5, DL5, D9

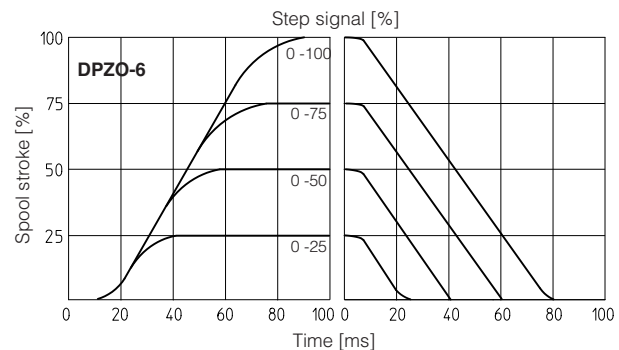
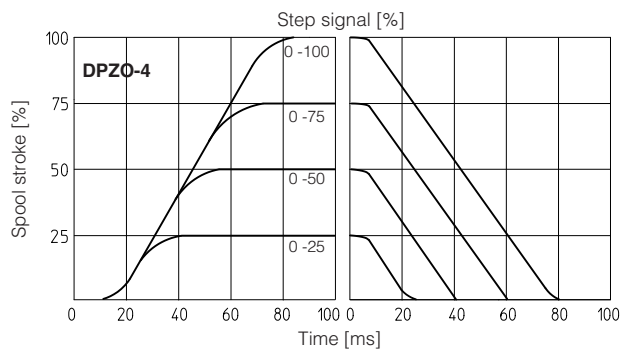
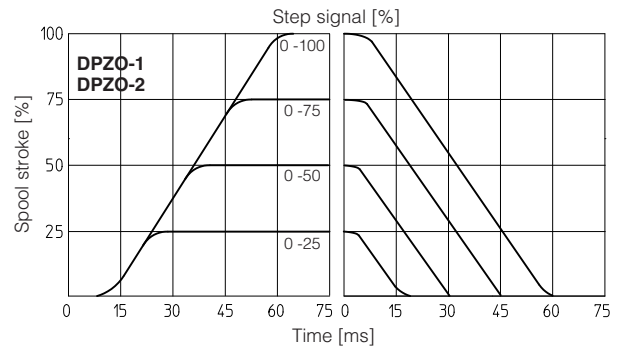
**DPZO-6:**

**6** = L5, S5, D5

### 8.3 Response time

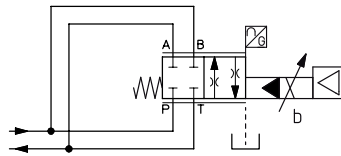
The response times in below diagrams are measured at different steps of the reference input signal. They have to be considered as average values.

For the valves with digital electronics the dynamics performances can be optimized by setting the internal software parameters.



#### 8.4 Operation as throttle valve

Single solenoid valves (\*51) can be used as simple throttle valves:  
 $P_{max} = 250 \text{ bar}$



DPZO-*	151-L5	251-L5	451-L5	651-L5
Max flow [l/min] $\Delta p = 30 \text{ bar}$	320	860	1600	2200

### 9 HYDRAULIC OPTIONS

#### 9.1 Option /B

Solenoid, integral electronics and position transducer at side of port A of the main stage.  
 For hydraulic configuration vs reference signal, see section 8.1

#### 9.2 Pilot and drain configuration

The pilot / drain configuration can be modified as shown in the functional scheme here aside, for detailed view of plugs position, see section 15  
 The valve's standard configuration provides internal pilot and external drain.

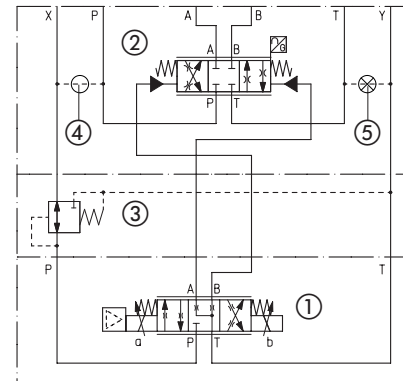
For different pilot / drain configuration select:

**Option /E** External pilot (through port X)

**Option /D** Internal drain (through port T)

- ① Pilot valve
- ② Main stage
- ③ Pressure reducing valve
- ④ Plug to be added for external pilot trough port X
- ⑤ Plug to be removed for internal drain through port T

**FUNCTIONAL SCHEME**  
 example of configuration 71



### 10 ELECTRONIC OPTIONS

Standard driver execution provides on the 7 pin main connector:

**Power supply** - 24 VDC must be appropriately stabilized or rectified and filtered; **2,5 A** fuse is time lag required in series to each driver power supply. Apply at least a 10000  $\mu\text{F}/40 \text{ V}$  capacitance to single phase rectifiers or a 4700  $\mu\text{F}/40 \text{ V}$  capacitance to three phase rectifiers

**Reference input signal** - analog differential input with  $\pm 10 \text{ VDC}$  nominal range (pin D, E), proportional to desired valve spool position

**Monitor output signal** - analog output signal proportional to the actual valve's spool position with  $\pm 10 \text{ VDC}$  nominal range

**Note:** a minimum booting time between 400 and 800 ms has been considered from the driver energizing with the 24 Vdc power supply before the valve has been ready to operate. During this time the current to the valve coils is switched to zero.

#### 10.1 Option /F

It provides a Fault output signal in place of the Monitor output signal, to indicate fault conditions of the driver (cable interruption of spool transducers or reference signal - for /I option): Fault presence corresponds to 0 VDC, normal working corresponds to 24 VDC

#### 10.2 Option /I

It provides 4 ÷ 20 mA current reference and monitor signals, instead of the standard  $\pm 10 \text{ V}$ .

Input signal can be reconfigured via software selecting between voltage and current, within a maximum range of  $\pm 10 \text{ V}$  or  $\pm 20 \text{ mA}$ .

It is normally used in case of long distance between the machine control unit and the valve or where the reference signal can be affected by electrical noise; the valve functioning is disabled in case of reference signal cable breakage.

#### 10.3 Option /Q

To enable the driver, supply 24 VDC on pin C referred to pin B: Enable input signal allows to enable/disable the current supply to the solenoid, without removing the electrical power supply to the driver; it is used to maintain active the communication and the other driver functions when the valve has to be disabled. This condition does not comply with European Norms EN13849-1 (ex EN954-1).

#### 10.4 Option /Z

It provides, on the 12 pin main connector, the following additional features:

##### Enable Input Signal

To enable the driver, supply 24 VDC on pin 3 referred to pin 2: Enable input signal allows to enable/disable the current supply to the solenoid, without removing the electrical power supply to the driver; it is used to maintain active the communication and the other driver functions when the valve has to be disabled. This condition does not comply with European Norms EN13849-1 (ex EN954-1).

##### Fault Output Signal

Fault output signal indicates fault conditions of the driver (solenoid short circuits/not connected, reference signal cable broken for 4÷20mA input, etc.). Fault presence corresponds to 0 VDC, normal working corresponds to 24VDC (pin 11 referred to pin 2): Fault status is not affected by the Enable input signal

##### Power supply for driver's logics and communication - only for TES

Separate power supply (pin 9,10) allow to cut solenoid power supply (pin 1,2) while maintaining active diagnostics, USB and fieldbus communication. A safety fuse is required in series to each driver power supply: 500 mA fast fuse.

#### 10.5 Possible combined options

/FI, /IQ and /IZ

## 11 ELECTRONIC CONNECTIONS AND LEADS

### 11.1 Main connector signal - 7 pin - standard, /F and /Q options (A1)

PIN	Standard	/Q	/F	TECHNICAL SPECIFICATIONS	NOTES
A	<b>V+</b>			Power supply 24 Vdc Rectified and filtered: $V_{RMS} = 20 \div 32 V_{MAX}$ (ripple max 10 % $V_{PP}$ )	Input - power supply
B	<b>V0</b>			Power supply 0 Vdc	Gnd - power supply
C	<b>AGND</b>		<b>AGND</b>	Analog ground	Gnd - analog signal
		<b>ENABLE</b>		Enable (24 Vdc) or disable (0 Vdc) the valve, referred to V0	Input - on/off signal
D	<b>Q_INPUT+</b>			Flow reference input signal: $\pm 10 Vdc / \pm 20 mA$ maximum range Defaults are $\pm 10 Vdc$ for standard and $4 \div 20 mA$ for /I option	Input - analog signal <b>Software selectable</b>
E	<b>INPUT-</b>			Negative reference input signal for Q_INPUT+	Input - analog signal
F	<b>Q_MONITOR</b> referred to:			Flow monitor output signal: $\pm 10 Vdc / \pm 20 mA$ maximum range Defaults are $\pm 10 Vdc$ for standard and $4 \div 20 mA$ for /I option	Output - analog signal <b>Software selectable</b>
	AGND	V0			
G			<b>FAULT</b>	Fault (0 Vdc) or normal working (24 Vdc)	Output - on/off signal
	<b>EARTH</b>			Internally connected to the driver housing	

### 11.2 Main connector signal - 12 pin - /Z option (A2)

PIN	TEB-SN /Z	TES-SN /Z	TECHNICAL SPECIFICATIONS	NOTES
	<b>V+</b>		Power supply 24 Vdc Rectified and filtered: $V_{RMS} = 20 \div 32 V_{MAX}$ (ripple max 10 % $V_{PP}$ )	Input - power supply
1	<b>V0</b>		Power supply 0 Vdc	Gnd - power supply
2	<b>ENABLE</b> referred to:		Enable (24 Vdc) or disable (0 Vdc) the valve	Input - on/off signal
3	V0	VL0		
4	<b>Q_INPUT+</b>		Flow reference input signal: $\pm 10 Vdc / \pm 20 mA$ maximum range Defaults are $\pm 10 Vdc$ for standard and $4 \div 20 mA$ for /I option	Input - analog signal <b>Software selectable</b>
5	<b>INPUT-</b>		Negative reference input signal for Q_INPUT+	Input - analog signal
6	<b>Q_MONITOR</b> referred to:		Flow monitor output signal: $\pm 10 Vdc / \pm 20 mA$ maximum range Defaults are $\pm 10 Vdc$ for standard and $4 \div 20 mA$ for /I option	Input - analog signal <b>Software selectable</b>
	AGND	VL0		
7	<b>AGND</b>		Analog ground	Output - analog signal
		<b>NC</b>	Do not connect	Gnd - analog signal
8	<b>R_ENABLE</b>		Repeat enable, output repeter signal of enable input, referred to V0	
		<b>NC</b>	Do not connect	Output - on/off signal
9	<b>NC</b>		Do not connect	
10		<b>VL+</b>	Power supply 24 Vdc for driver's logic and communication	Input - power supply
		<b>VL0</b>	Power supply 0 Vdc for driver's logic and communication	Gnd - power supply
11 PE	<b>FAULT</b> referred to:		Fault (0 Vdc) or normal working (24 Vdc)	Output - on/off signal
	V0	VL0		
	<b>EARTH</b>		Internally connected to the driver housing	

**Note:** do not disconnect VL0 before VL+ when the driver is connected to PC USB port

### 11.3 Communications connectors (B) - (C)

(B) USB connector - M12 - 5 pin always present		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	<b>+5V_USB</b>	Supply for external USB Flash Drive
2	<b>ID</b>	USB Flash Drive identification
3	<b>GND_USB</b>	Signal zero data line
4	<b>D-</b>	Data line -
5	<b>D+</b>	Data line +

(C1) (C2) BC fieldbus execution, connector - M12 - 5 pin		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	<b>CAN_SHLD</b>	Shield
2	<b>not used</b>	(C1) - (C2) pass-through connection (2)
3	<b>CAN_GND</b>	Signal zero data line
4	<b>CAN_H</b>	Bus line (high)
5	<b>CAN_L</b>	Bus line (low)

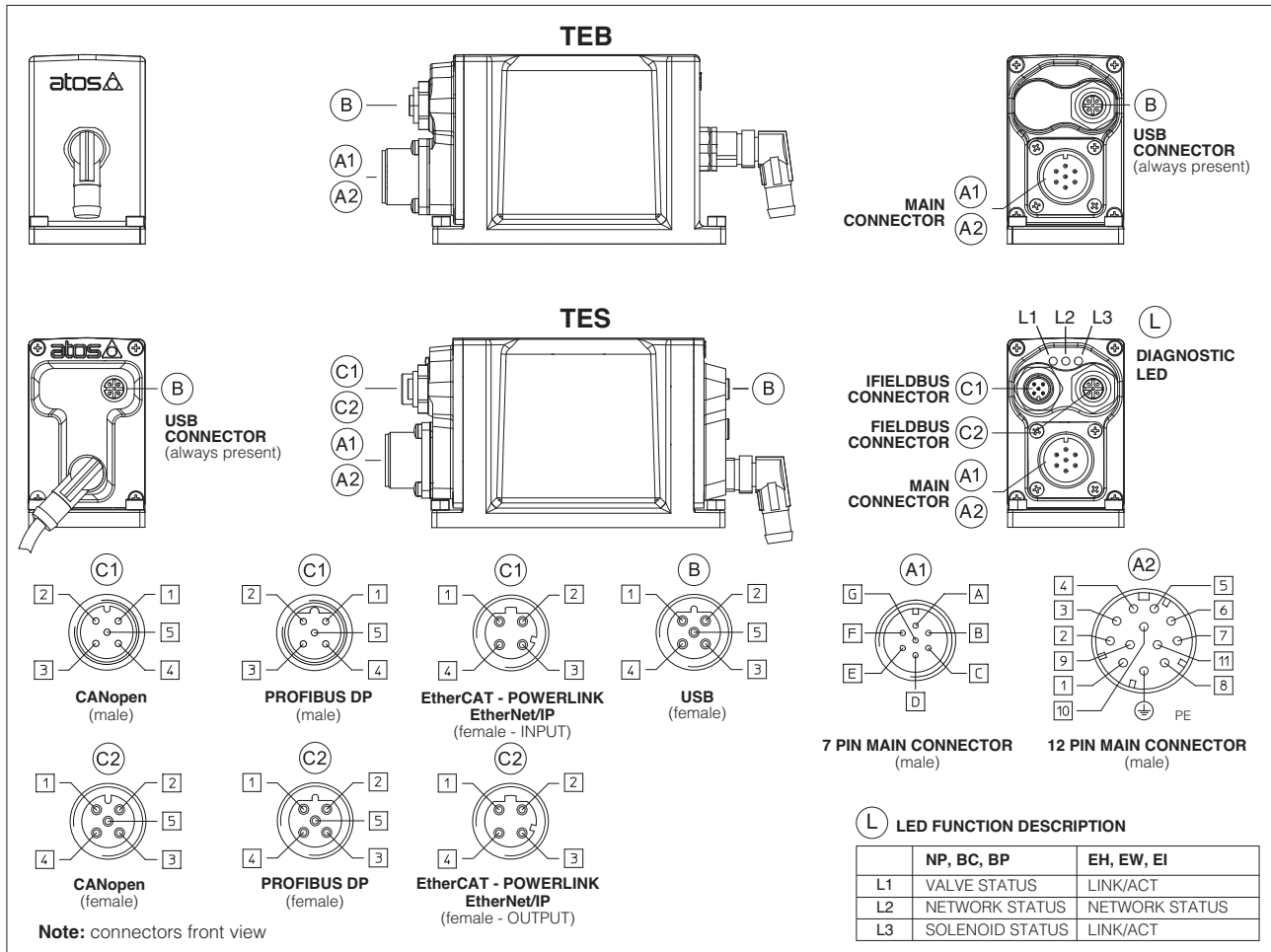
(C1) (C2) BP fieldbus execution, connector - M12 - 5 pin		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	<b>+5V</b>	Termination supply signal
2	<b>LINE-A</b>	Bus line (high)
3	<b>DGND</b>	Data line and termination signal zero
4	<b>LINE-B</b>	Bus line (low)
5	<b>SHIELD</b>	

(C1) (C2) EH, EW, EI fieldbus execution, connector - M12 - 4 pin		
PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	<b>TX+</b>	Transmitter
2	<b>RX+</b>	Receiver
3	<b>TX-</b>	Transmitter
4	<b>RX-</b>	Receiver
Housing	<b>SHIELD</b>	

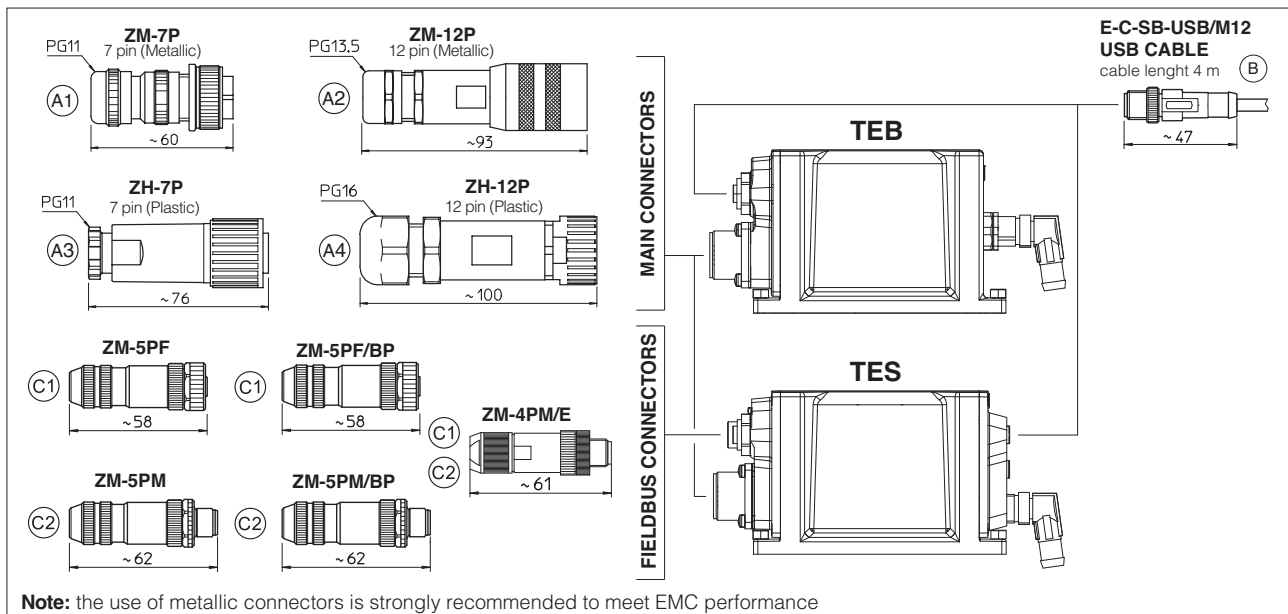
**Notes:** (1) shield connection on connector's housing is recommended

(2): pin 2 can be fed with external +5V supply of CAN interface

## 11.4 Connections layout



## 12 CONNECTORS



## 13 MODEL CODES OF MAIN CONNECTORS AND COMMUNICATION CONNECTORS - to be ordered separately

VALVE VERSION	TEB TES	TEB / Z TES / Z	BC - CANopen	BP - PROFIBUS DP	EH - EtherCat EW - POWERLINK EI - EtherNet/IP
CONNECTOR CODE	ZM-7P (A1)	ZM-12P (A2)	ZM-5PF (C1)	ZM-5PF/BP (C1)	ZM-4PM/E (C1)
	ZH-7P (A3)	ZH-12P (A4)	ZM-5PM (C2)	ZM-5PM/BP (C2)	ZM-4PM/E (C2)
PROTECTION DEGREE	IP67				
DATA SHEET	GS208, GS210, K500				

only for **TES**



**14 PROGRAMMING TOOLS** - see table **GS500**

Valve's functional parameters and configurations, can be easily set and optimized using Atos E-SW programming software connected via USB port to the digital driver. For fieldbus versions, the software permits valve's parameterization through USB port also if the driver is connected to the central machine unit via fieldbus.

The software is available in different versions according to the driver's options:

**E-SW-BASIC** support: NP (USB) PS (Serial) IR (Infrared)

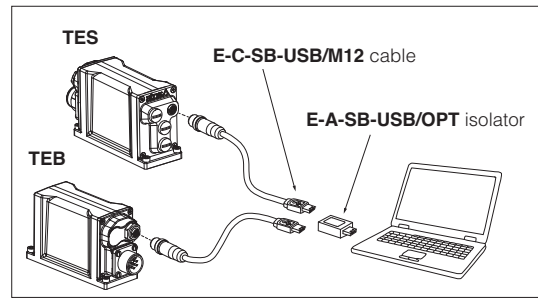
**E-SW-FIELDBUS** support: BC (CANopen) BP (PROFIBUS DP) EH (EtherCAT)  
EW (POWERLINK) EI (EtherNet/IP)

**E-SW-\*/PQ** support: valves with SP, SF, SL alternated control (e.g. E-SW-BASIC/PQ)

**WARNING: drivers USB port is not isolated!**

The use of isolator adapter is highly recommended for PC protection (see table **GS500**)

**USB connection**



**15 PLUGS LOCATION FOR PILOT/DRAIN CHANNELS**

Depending on the position of internal plugs, different pilot/drain configurations can be obtained as shown below.

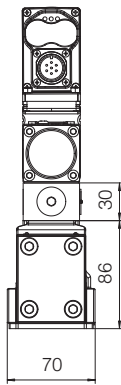
To modify the pilot/drain configuration, proper plugs must only be interchanged. The plugs have to be sealed using loctite 270.

Standard valves configuration provides internal pilot and external drain

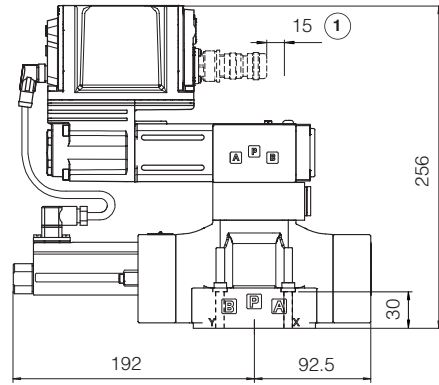
<p><b>DPZO-1 Pilot channels</b></p>	<p><b>Drain channels</b></p>	<p><b>Internal piloting:</b> blinded plug SP-X300F ① in X;  <b>External piloting:</b> blinded plug SP-X300F ② in Pp;  <b>Internal drain:</b> blinded plug SP-X300F ③ in Y;  <b>External drain:</b> blinded plug SP-X300F ④ in Dr.</p>
<p><b>DPZO-2 Pilot channels</b></p>	<p><b>Drain channels</b></p>	<p><b>Internal piloting:</b> Without blinded plug SP-X300F ①;  <b>External piloting:</b> Add blinded plug SP-X300F ①;  <b>Internal drain:</b> Without blinded plug SP-X300F ②;  <b>External drain:</b> Add blinded plug SP-X300F ②.</p>
<p><b>DPZO-4 Pilot channels</b></p>	<p><b>Drain channels</b></p>	<p><b>Internal piloting:</b> Without blinded plug SP-X500F ①;  <b>External piloting:</b> Add blinded plug SP-X500F ①;  <b>Internal drain:</b> Without blinded plug SP-X300F ②;  <b>External drain:</b> Add blinded plug SP-X300F ②.</p>
<p><b>DPZO-6 Pilot channels</b></p>	<p><b>Drain channels</b></p>	<p><b>Internal piloting:</b> Without plug ①;  <b>External piloting:</b> Add DIN-908 M16x1,5 in pos ①;  <b>Internal drain:</b> Without blinded plug SP-X300F ③;  <b>External drain:</b> Add blinded plug SP-X300F ③.</p>



16 INSTALLATION DIMENSIONS [mm]



**DPZO-TEB\*-15\***  
**DPZO-TES\*-15\***



271 for **EW - POWERLINK,**  
**EI - EtherNet/IP**

Mass 9 kg

**ISO 4401: 2005**

**Mounting surface: 4401-05-05-0-05**

(see table P005)

Fastening bolts:

4 socket head screws M6x40 class 12.9

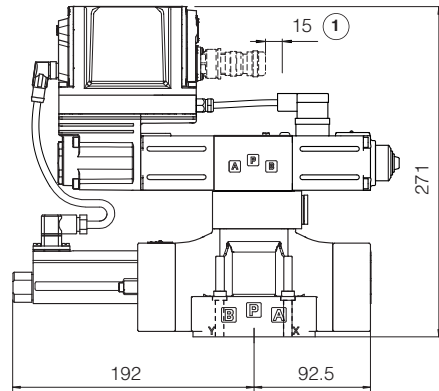
Tightening torque = 15 Nm

Seals: 5 OR 2050; 2 OR 108

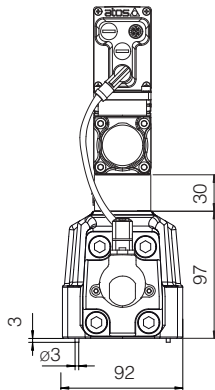
Diameter of ports A, B, P, T:  $\varnothing = 11$  mm;

Diameter of ports X, Y:  $\varnothing = 5$  mm;

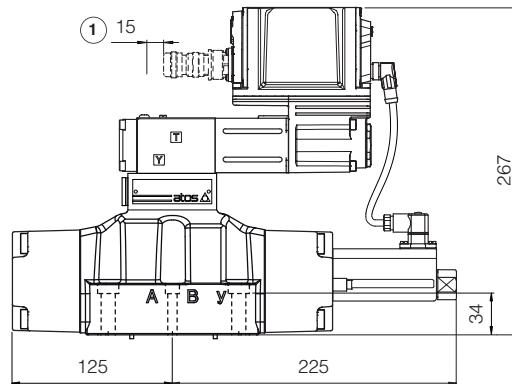
**DPZO-TEB\*-17\***  
**DPZO-TES\*-17\***



Mass 9,8 kg



**DPZO-TEB\*-25\***  
**DPZO-TES\*-25\***



Mass 14 kg

**ISO 4401: 2005**

**Mounting surface: 4401-07-07-0-05**

(see table P005)

Fastening bolts:

4 socket head screws M10x50 class 12.9

Tightening torque = 70 Nm

2 socket head screws M6x45 class 12.9

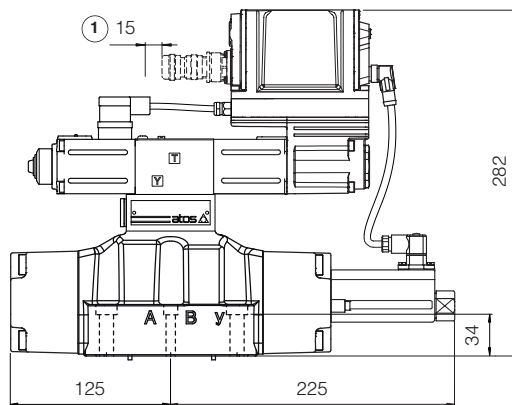
Tightening torque = 15 Nm

Seals: 4 OR 130; 2 OR 2043

Diameter of ports A, B, P, T:  $\varnothing = 20$  mm;

Diameter of ports X, Y:  $\varnothing = 7$  mm;

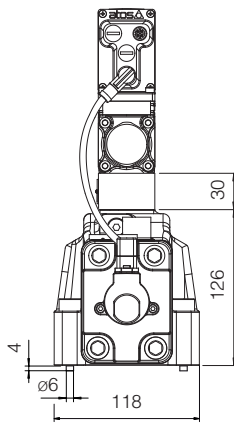
**DPZO-TEB\*-27\***  
**DPZO-TES\*-27\***



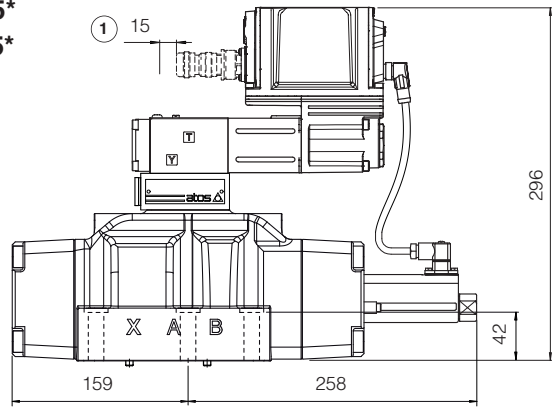
Mass 14,8 kg

① = Space to remove the 7 or 12 pin main connector

For main and communication connectors see section 12, 13



**DPZO-TEB\*-45\***  
**DPZO-TES\*-45\***



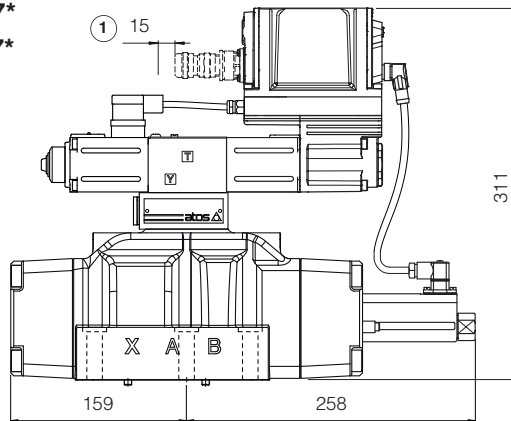
311 for **EW - POWERLINK,**  
**EI - EtherNet/IP**

Mass 18,5 kg

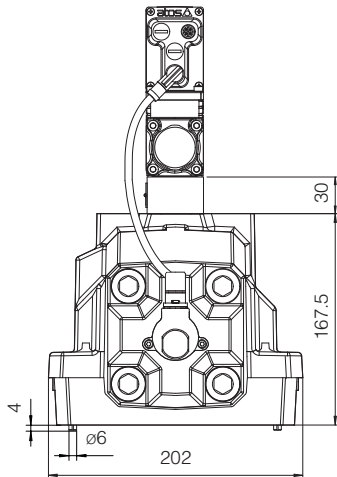
**ISO 4401: 2005**  
**Mounting surface: 4401-08-08-0-05**  
(see table P005)  
Fastening bolts:  
6 socket head screws M12x60 class 12.9  
Tightening torque = 125 Nm

**DPZO-4**  
Seals: 4 OR 4112; 2 OR 3056  
Diameter of ports A, B, P, T:  $\varnothing = 24$  mm;  
Diameter of ports X, Y:  $\varnothing = 7$  mm;

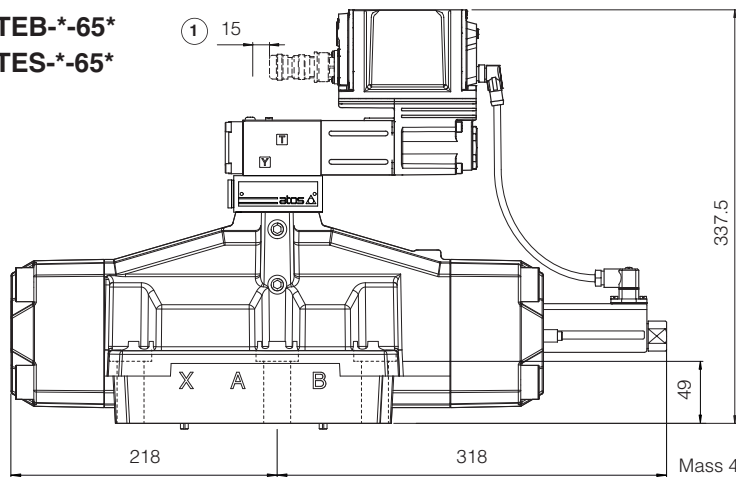
**DPZO-TEB\*-47\***  
**DPZO-TES\*-47\***



Mass 19,3 kg



**DPZO-TEB\*-65\***  
**DPZO-TES\*-65\***

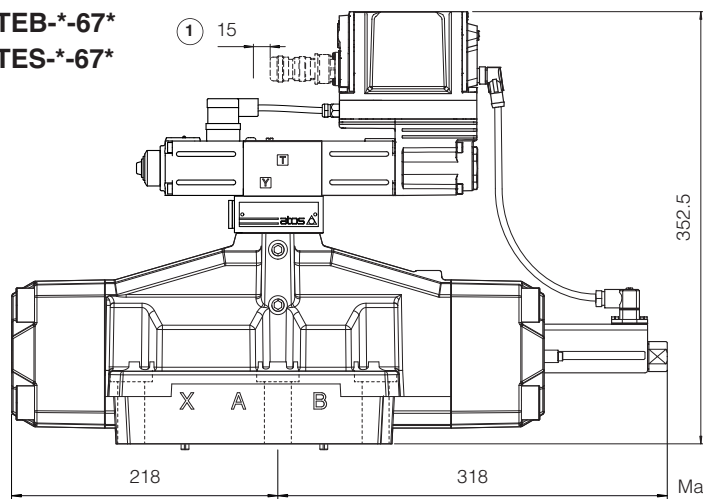


352.5 for **EW - POWERLINK,**  
**EI - EtherNet/IP**

Mass 42,5 kg

**ISO 4401: 2005**  
**Mounting surface: 4401-10-09-0-05**  
(see table P005)  
Fastening bolts:  
6 socket head screws M20x90 class 12.9  
Tightening torque = 600 Nm  
Diameter of ports A, B, P, T:  $\varnothing = 34$  mm;  
Diameter of ports X, Y:  $\varnothing = 7$  mm;  
Seals: 4 OR 144, 2 OR 3056

**DPZO-TEB\*-67\***  
**DPZO-TES\*-67\***



Mass 43,3 kg

① = Space to remove the 7 or 12 pin main connector

For main and communication connectors see section 12, 13