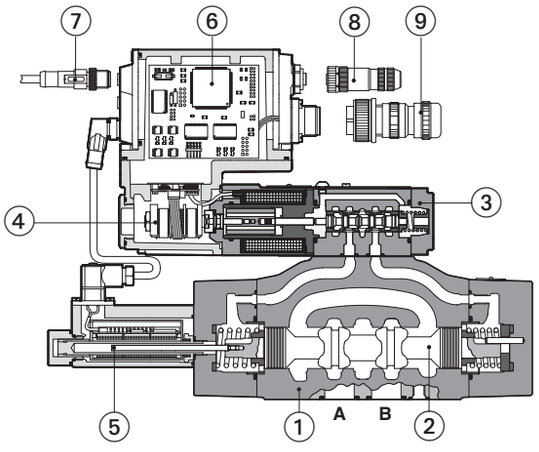
Two stage servoproportional directional valves

digital, with two position transducers and **zero spool overlap**, rugged design



DPZO-LES-SN-BP-270

① Valve body
② Main stage Spool
③ Pilot valve
④ Pilot valve position transducer
⑤ Main stage position transducer
⑥ Integral electronics
⑦ USB connector
⑧ Fieldbus connectors
⑨ Main connector

DPZO-LEB, DPZO-LES

Servoproportional two stage digital proportional valves with two LVDT position transducer and zero spool overlap for position closed loop controls.

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.

Servoproportional valves are available in LEB basic execution with analog reference signals and USB port for software functional parameters setting or in LES full execution which includes also optional alternated P/Q controls and fieldbus interfaces for functional parameters setting, reference signals and real-time diagnostics.

Digital LEZ version (tech table FS230) integrates the closed loop axis control functions, while LEB and LES versions can be used in combination with remote Z-ME-KZ digital axis controller (see tech table G340).

Size: **10** to **35**
Max flow: **180** to **3500 l/min**
Max pressure: **350 bar**

1 MODEL CODE for STANDARD SPOOLS

DPZO	-	L	ES	-	SN	-	NP	-	2	70	-	L	5	/	*	/	*	/	*

DPZO
Two stage proportional directional valve

L = closed-loop two LVDT transducer

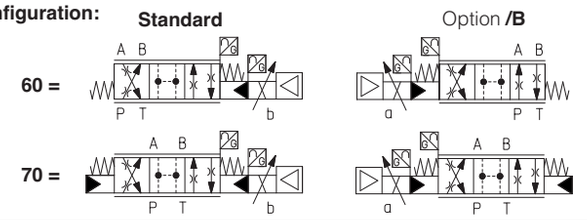
Integral digital drivers:
EB = basic **(1)** **ES** = full

Alternated P/Q controls - see section 4
SN = none
SP = pressure control (1 pressure tranducer)
SF = force control (2 pressure tranducers)
SL = force control (1 load cell)

Fieldbus interfaces USB port always present:
NP = Not present **(1)** **EW** = POWERLINK
BC = CANopen **EH** = EtherCAT
BP = PROFIBUS DP **EI** = EtherNet/IP

Valve size ISO 4401:
1 = 10 **2** = 16 **4** = 25 **4M** = 27 **6** = 32 **8** = 35

Configuration:



Spool type - regulating characteristics:

L = linear
DL = differential-linear
P-A = Q, B-T = Q/2
P-B = Q/2, A-T = Q
T = non linear **(2)**

***** Seals material, see sect. 7, 8:
- = NBR
PE = FKM
BT = HNBR

Series number

Hydraulic options, see section 11:
B = solenoid, integral electronics and position transducer at side of port B of the main stage (side A of pilot valve) **(3)**
D = internal drain
E = external pilot (through port X)
G = pressure reducing valve for piloting - standard for size 10

Electronic options, see sections 12
I = current reference input and monitor 4÷20 mA (omit for standard voltage reference input and monitor ±10 V)

Only for **SN (4)**:
F = fault signal
Q = enable signal
Z = double power supply **(5)**, enable, fault and monitor signals - 12 pin connector

Only for **SP, SF, SL**:
C = current feedback for remote transducer(s)

Spool size	**3** (L)	**5** (L,DL)	**5** (L)	**5** (T)
DPZO-1 =	-	100	-	-
DPZO-2 =	160	250	-	190
DPZO-4 =	-	480	-	-
DPZO-4M =	-	550	-	-
DPZO-6 =	-	-	640	-
DPZO-8 =	-	-	1200	-

Nominal flow (l/min) at Δp 10bar P-T

(1) LEB available only in version **SN-NP**
(2) only for configuration 70
(3) In standard configuration the solenoid with integral electronics and position transducer are at side A of main stage (side B of pilot valve)
(4) F, Q, Z options are standard for **SP, SF, SL**
(5) double power supply only for **LES**

2 GENERAL NOTES

DPZO-LEB, LES 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

3 AXIS CONTROLLER

Digital servoproportional with integral electronics **LEZ** include valve's driver plus axis controller, performing position closed loop of any hydraulic actuator equipped with analog, encoder or SSI position transducer. S* option add alternated P/Q control to the basic position ones.

For detailed information about integral axis controller see tech table **FS230**.

Atos also supply complete servoactuators integrating servocylinder, digital servoproportional valve and axis controller, fully assembled and tested. For more information consult Atos Technical Office.

4 ALTERNATED P/Q CONTROLS - only for **LES**

S* options add the closed loop control of pressure (**SP**) or force (**SF** and **SL**) to the basic functions of proportional directional valves flow regulation. A dedicated algorithm alternates pressure (force) depending on the actual hydraulic system conditions.

An additional connector is available for transducers to be interfaced to the valve's driver (1 pressure transducer for SP, 2 pressure transducers for SF or 1 load cell for SL). Main 12 pin connector is the same as /Z option plus two analog signals specific for the pressure (force) control.

For detailed information and connector wiring of options SP, SF, SL see tech table **GS212**.

Note: for proportional valve with zero overlapped spool the alternated pressure control (SP) is possible only for specific installation conditions, see tech. table GS212

5 FIELDBUS - only for **LES**

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**.

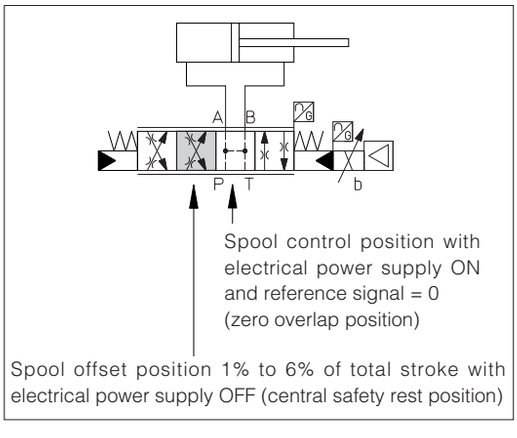
6 CENTRAL SAFETY REST POSITION OF ZERO SPOOL OVERLAP - configuration 70

In absence of electric power supply (+24 VDC), the valve main spool is moved by the springs force to the **central safety rest position** characterized by a small offset of about 1% to 6% of the total stroke in P-B / A-T configuration.

This is specifically designed to avoid that in case of accidental interruption of the electrical power supply to the valve, the actuator moves towards an undefined direction (due to the tolerances of the zero overlap spool), with potential risk of damages or personnel injury.

Thanks to the **central safety rest position** the actuator movement is suddenly stopped and it is recovered at very low speed towards the direction corresponding to the P-B/ A-T connection.

The main spool moves to the closed loop control position (zero overlap) when the pilot pressure is activated, the valve is fed with power supply +24 VDC and reference input = 0V (or 12 mA for option /I) is applied to the driver.



7 MAIN CHARACTERISTICS

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	**standard** = -20°C ÷ +60°C **/BT** option = -40°C ÷ +60°C			
Storage temperature range	**standard** = -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 occuring surface temperatures of the solenoid coils, the European standards ISO 13732-1 and EN 982 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-*-4M**	**DPZO-*-6**	**DPZO-*-8**
Pressure limits [bar]		ports **P, A, B, X** = 350; **T** = 250 (10 for option /D); **Y** = 10;							
Spool type		**L5, DL5**	**L3**	**L5, DL5**	**T5**	**L5, DL5**		**L5**	
Nominal flow [l/min] **(1)** Δp P-T	Δp= 10 bar	100	160	250	190	480	550	640	1200
	Δp= 30 bar	160	270	430	330	830	950	1100	2000
Max permissible flow [l/min]		180	400	550	550	1000	1100	1600	3500
Piloting pressure [bar]		min. = 25; max = 350 (option /G advisable for pilot pressure > 200 bar)							
Piloting volume [cm³/min]		1,4	3,7			9	11,3	21,6	39,8
Piloting flow **(2)** [l/min]		3,5	9			18	20	19	24
Leakage Pilot [cm³/min]		100/300	150/450			200/600	200/600	900/2800	900/2800
(3) Main stage [l/min]		0,4/1,2	0,6/2,5			1,0/4,0	1,0/4,0	3,0/9,0	6,0/20
Response time **(4)** [ms] (0-100% step signal)		< 25	< 25			< 30	< 35	< 80	< 100
Hysteresis		≤ 0,1 [%of max regulation]							
Repeatability		± 0,1 [%of max regulation]							
Thermal drift		zero point displacement < 1% at ΔT = 40°C							

Notes:
above performance data refer to valves coupled with Atos electronic drivers, see section 9.
(1) For different Δp, the max flow is in accordance to the diagrams in section 10.2
(2) with step reference input signal 0 ÷100 %
(3) at p = 100/350 bar
(4) see diagrams in section 10.3

8 SEALS AND HYDRAULIC FLUID

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 mm²/s - max allowed range 15 ÷ 380 mm²/s		
Fluid contamination class	ISO 4406 class 20/18/15 NAS 1638 class 9, in line filters of 10 μm (β10 ≥75 recommended)		
Hydraulic fluid	**Suitable seals type**	**Classification**	**Ref. Standard**
Mineral oils	NBR, FKM, HNBR	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR, HNBR	HFC	

Note: For other fluids not included in above table, consult our technical office

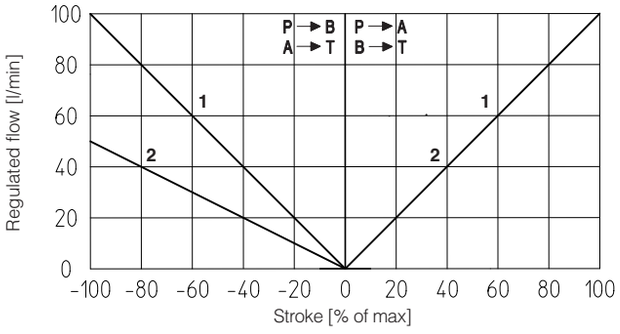
9 ELECTRONIC DRIVERS

Valve model	**LEB**	**LES**	**LES-SP, SF, SL**	**LEZ**
Drivers model	E-RI-LEB-N	E-RI-LES-N	E-RI-LES-S	E-RI-LEZ
Type	Digital			
Format	Integral to valve			
Data sheet	GS208	GS210	GS212	FS230

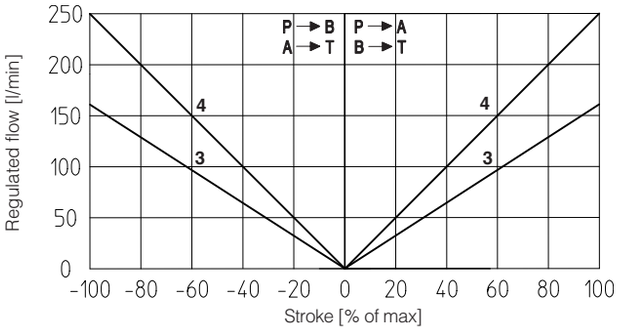
Note: for main and communication connectors see sections 14, 15

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

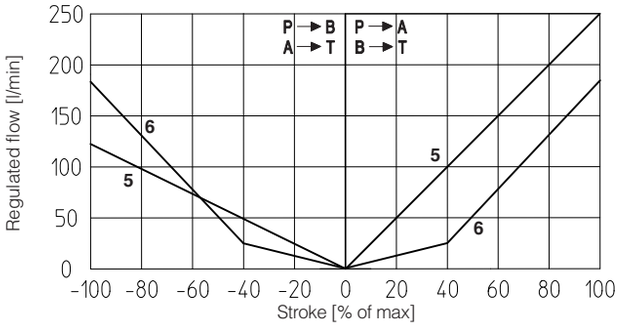
10.1 Regulation diagrams (values measure at Δp 10 bar P-T)



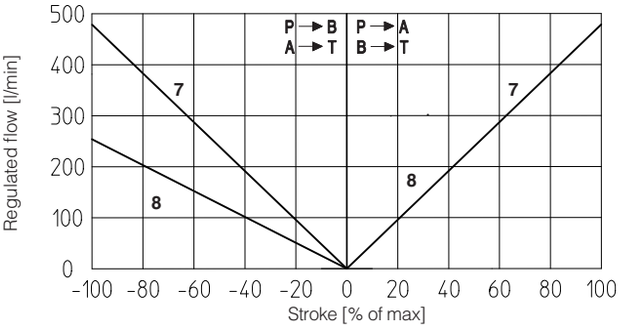
DPZO-1: **1** = L5 **2** = DL5



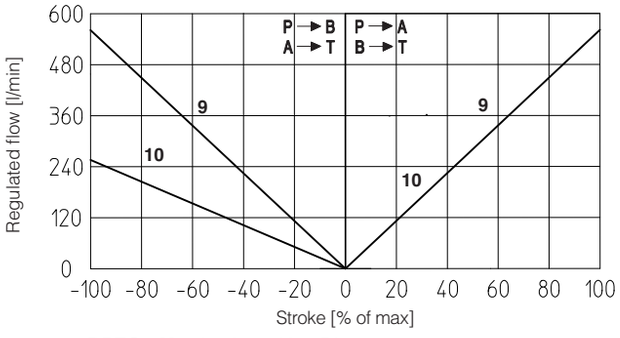
DPZO-2: **3** = L3 **4** = L5



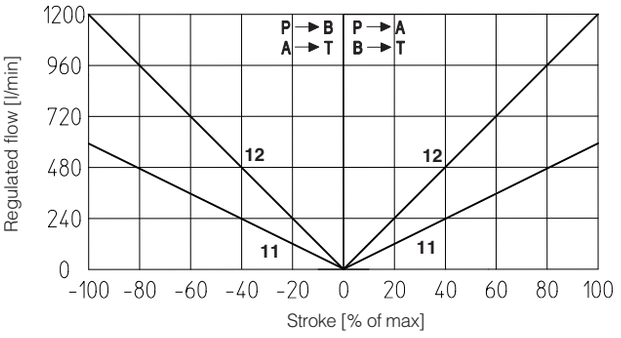
DPZO-2: **5** = DL5 **6** = T5



DPZO-4: **7** = L5 **8** = DL5

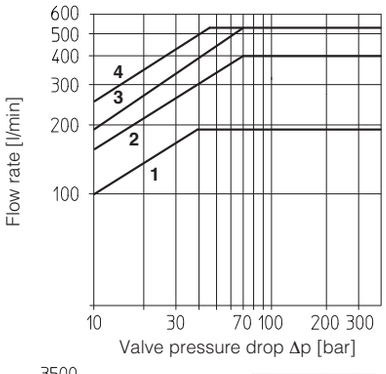


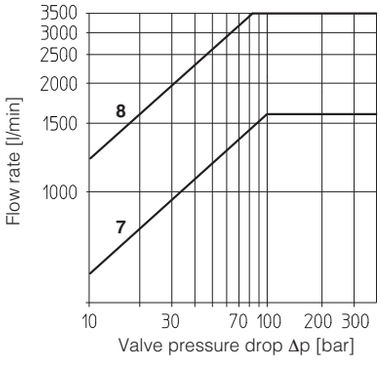
DPZO-4M: **9** = L5 **10** = DL5

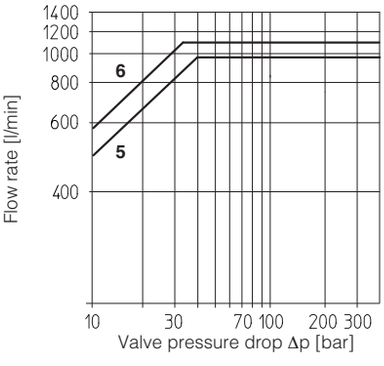


DPZO-6: **11** = L5 **DPZO-8:** **12** = L5

10.2 Flow /Δp diagram - stated at 100% of spool stroke







DPZO-1:
1 = spools L5, DL5

DPZO-2:
2 = spools L3
3 = spool T5
4 = spools L5, DL5

DPZO-4:
5 = spools L5, DL5

DPZO-4M:
6 = spools L5, DL5

DPZO-6:
7 = L5

DPZO-8:
8 = L5

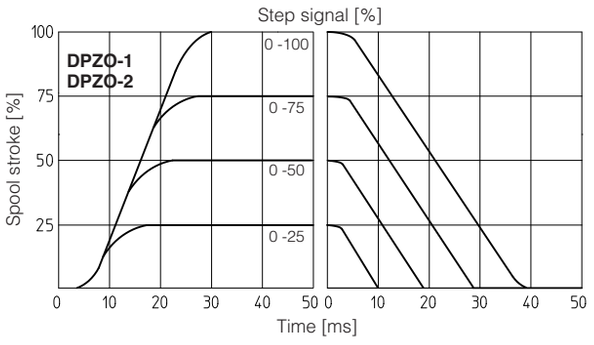
Note: Hydraulic configuration vs. reference signal for configurations 60 and 70 (standard and option /B)

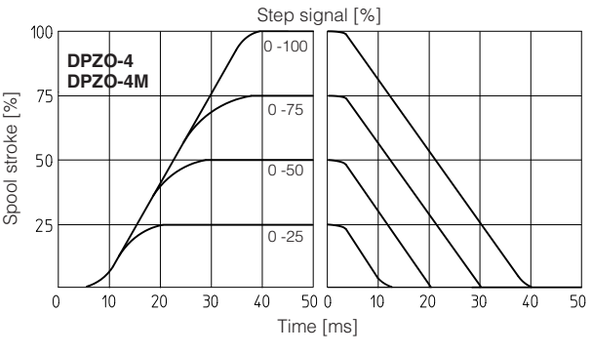
Reference signal $\left.\begin{matrix}0 \div +10\ V \\ 12 \div 20\ mA\end{matrix}\right\}$ P → A / B → T

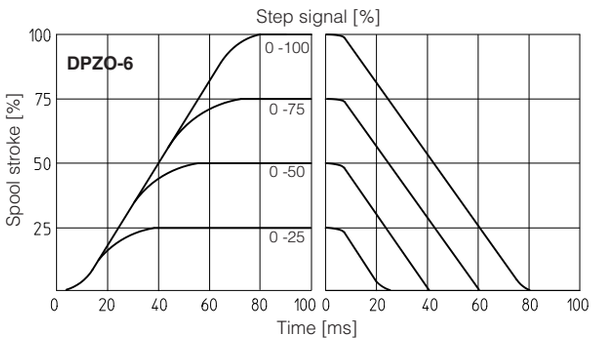
Reference signal $\left.\begin{matrix}0 \div -10\ V \\ 4 \div 12\ mA\end{matrix}\right\}$ P → B / A → T

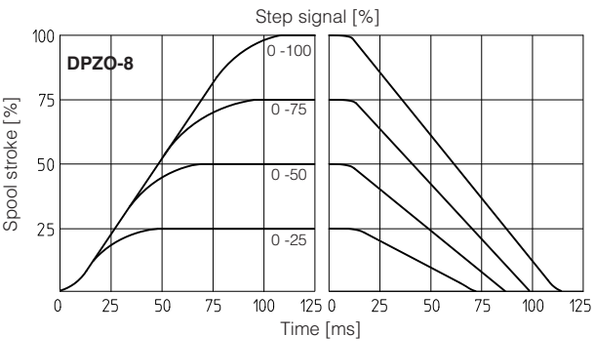
10.3 Response time

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.



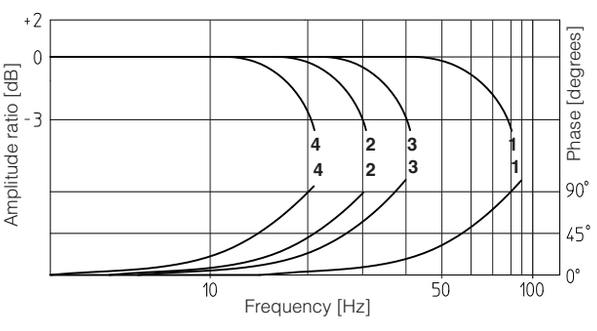


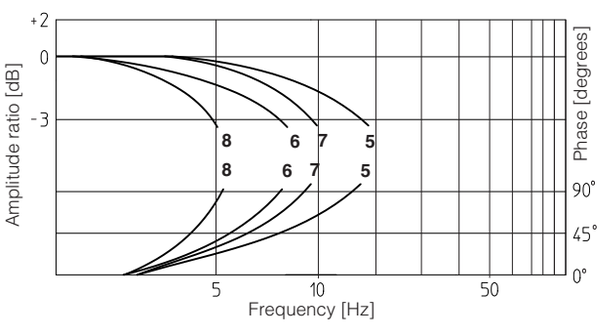




10.4 Bode diagrams

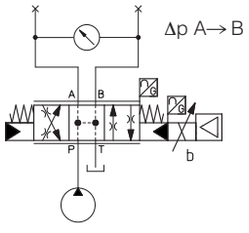
Stated at nominal hydraulic conditions.





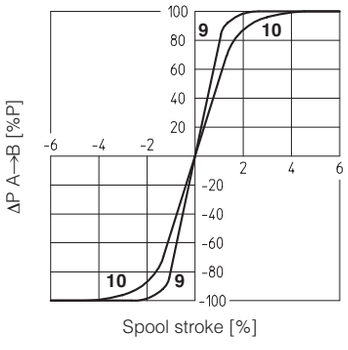
1 = DPZO-1, DPZO-2 } ± 5%
2 = DPZO-1, DPZO-2 } ± 100%
3 = DPZO-4, DPZO-4M } ± 5%
4 = DPZO-4, DPZO-4M } ± 100%
5 = DPZO-6 ± 5%
6 = DPZO-6 ± 100%
7 = DPZO-8 ± 5%
8 = DPZO-8 ± 100%

10.5 Pressure gain



9 = DPZO-1

10 = DPZO-2
DPZO-4
DPZO-4M
DPZO-6
DPZO-8



11 HYDRAULIC OPTIONS

11.1 Option /B

Solenoid, integral electronics and position transducer at side of port B of the main stage.
For hydraulic configuration vs reference signal, see section 10.1

11.2 Option /G

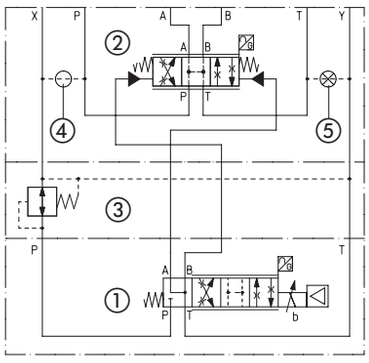
Pressure reducing valve ③ with fixed setting, installed between pilot valve and main body. Reduced pressure setting:
40 bar for DPZO-1 and DPZO-2
100 bar for DPZO-4(M), DPZO-6 and DPZO-8
It is advisable for valves with internal pilot in case of system pressure higher than 200 bar.
Pressure reducing valve ③ is standard for DPZO-1, for other sizes add **/G** option.

11.3 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 17
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)

FUNCTIONAL SCHEME - example of configuration 70



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

12 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 time lag is required in series to each driver power supply. Apply at least a 10000 μF/40 V capacitance to single phase rectifiers or a 4700 μF/40 V capacitance to three phase rectifiers

Reference input signal - analog differential input with ±10 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 ±10VDC nominal range

Note: a minimum booting time between 400 and 800 ms has be 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.

12.1 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

12.2 Option /I

It provides 4 ÷ 20 mA current reference and monitor signals, instead of the standard ±10 V.

Input signal can be reconfigured via software selecting between voltage and current, within a maximum range of ±10 V or ±20 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.

12.3 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).

12.4 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 24 VDC (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 **LES**

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.

12.5 Options /C - only for **SP, SF, SL**

Option /C is available to connect pressure (force) transducers with 4 ÷ 20 mA current output signal, instead of the standard ±10 V.

Input signal can be reconfigured via software selecting between voltage and current, within a maximum range of ±10 V or ±20 mA.

12.6 Possible combined options

For SN: **/FI, /IQ** and **/IZ**

For SP, SF, SL: **/CI**

13 ELECTRONIC CONNECTIONS AND LEDS

13.1 Main connector signals - 7 pin - standard, **/F** and **/Q** options (A1)

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

13.2 Main connector signals - 12 pin - **/Z** option and **SP, SF, SL** (A2)

PIN	LEB-SN /Z	LES-SN /Z	LES-SP, SF, SL Fieldbus	LES-SP, SF, SL NP	TECHNICAL SPECIFICATIONS	NOTES
1	**V+**				Power supply 24 VDC Rectified and filtered: VRMS = 20 ÷ 32 VMAX (ripple max 10 % VPP)	Input - power supply
2	**V0**				Power supply 0 VDC	Gnd - power supply
3	**ENABLE** referred to: V0	VL0	VL0	V0	Enable (24 VDC) or disable (0 VDC) the valve	Input - on/off signal
4	**Q_INPUT+**				Flow reference input signal: ±10 VDC / ±20 mA maximum range Defaults are ±10 VDC for standard and 4 ÷ 20 mA for /I option	Input - analog signal **Software selectable**
5	**INPUT-**				Negative reference input signal for Q_INPUT+ and F_INPUT+	Input - analog signal
6	**Q_MONITOR** referred to: AGND	VL0	VL0	V0	Flow monitor output signal: ±10 VDC / ±20 mA maximum range Defaults are ±10 VDC for standard and 4 ÷ 20 mA for /I option	Output - analog signal **Software selectable**
7	**AGND**				Analog ground	Gnd - analog signal
		NC			Do not connect	
			F_INPUT+		Pressure/Force reference input signal: ±10 VDC / ±20 mA maximum range Defaults are ±10 VDC for standard and 4 ÷ 20 mA for /I option	Input - analog signal **Software selectable**
8	**R_ENABLE**				Repeat enable, output repeter signal of enable input, referred to V0	Output - on/off signal
		NC			Do not connect	
			F_MONITOR referred to: VL0	V0	Pressure/Force monitor output signal: ±10 VDC / ±20 mA maximum range Defaults are ±10 VDC for standard and 4 ÷ 20 mA for /I option	Output - analog signal **Software selectable**
9	**NC**				Do not connect	
		VL+			Power supply 24 VDC for driver's logic and communication	Input - power supply
				D_IN0	Multiple pressure/force PID selection, referred to V0	Input - analog signal
10	**NC**				Do not connect	
		VL0			Power supply 0 VDC for driver's logic and communication	Gnd - power supply
				D_IN1	Multiple pressure/force PID selection (not available for SF), referred to V0	Input - on/off signal
11	**FAULT** referred to: V0	VL0	VL0	VL0	Fault (0 VDC) or normal working (24 VDC)	Output - on/off signal
PE	**EARTH**				Internally connected to the driver housing	

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

13.3 Communications connectors (B) - (C)

(B) **USB connector - M12 - 5 pin** always present

PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	**+5V_USB**	Supply for external USB Flash Drive
2	**ID**	USB Flash Drive identification
3	**GND_USB**	Signal zero data line
4	**D-**	Data line -
5	**D+**	Data line +

(C1) (C2) **BP fieldbus execution, connector - M12 - 5 pin**

PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	**+5V**	Termination supply signal
2	**LINE-A**	Bus line (high)
3	**DGND**	Data line and termination signal zero
4	**LINE-B**	Bus line (low)
5	**SHIELD**	

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

(C1) (C2) **BC fieldbus execution, connector - M12 - 5 pin**

PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	**CAN_SHLD**	Shield
2	**not used**	(C1) - (C2) pass-through connection (2)
3	**CAN_GND**	Signal zero data line
4	**CAN_H**	Bus line (high)
5	**CAN_L**	Bus line (low)

(C1) (C2) **EH, EW, EI fieldbus execution,connector - M12 - 4 pin**

PIN	SIGNAL	TECHNICAL SPECIFICATION (1)
1	**TX+**	Transmitter
2	**RX+**	Receiver
3	**TX-**	Transmitter
4	**RX-**	Receiver
Housing	**SHIELD**	

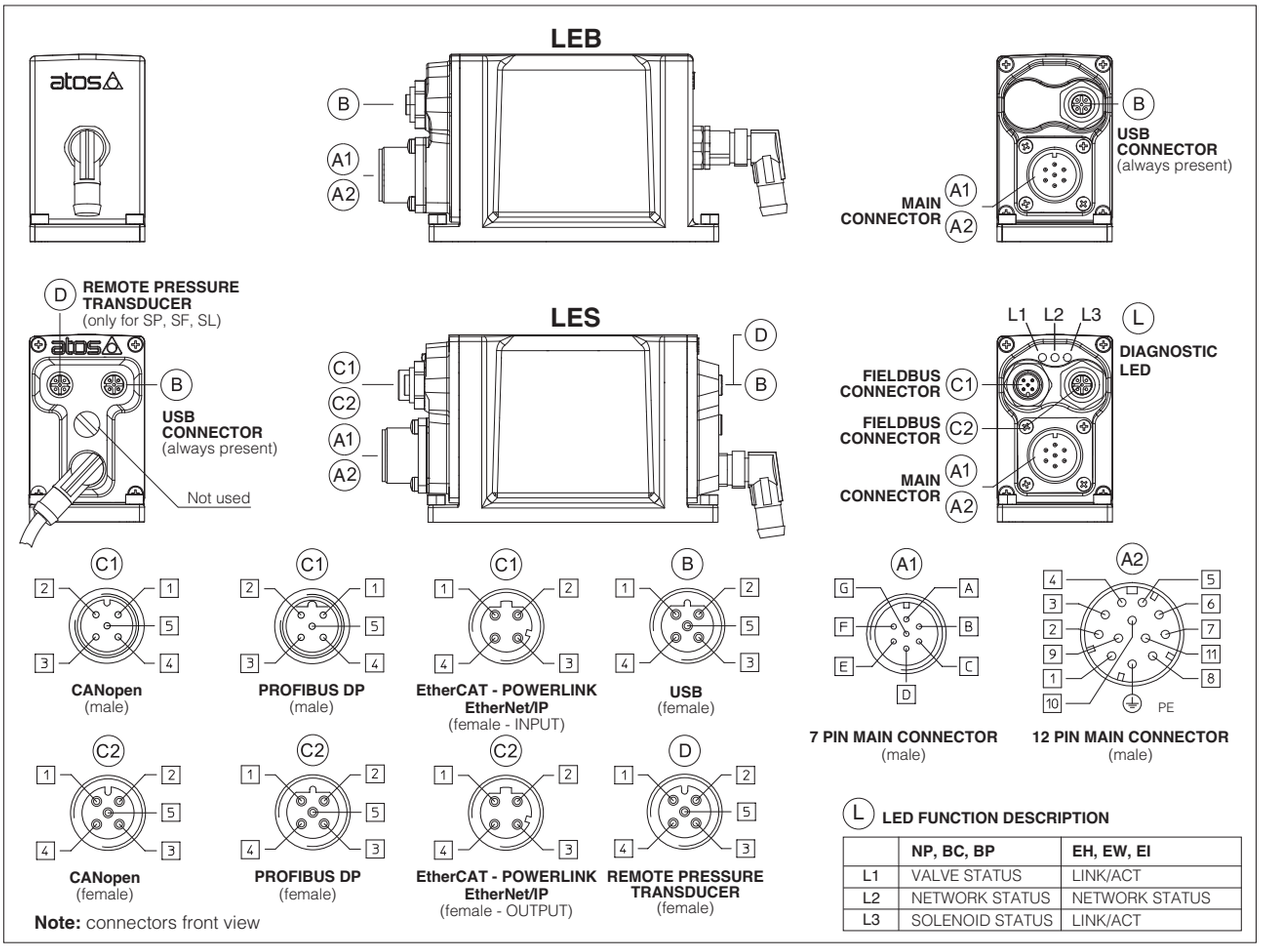
(2): pin 2 can be fed with external +5V supply of CAN interface

13.4 Remote pressure/force transducer connector - M12 - 5 pin - only for **SP, SF, SL** (D)

PIN	SIGNAL	TECHNICAL SPECIFICATION	Single transducer (1) Voltage	Single transducer (1) Current	Double transducers (1) Voltage	Double transducers (1) Current
1	**VF +24V**	Power supply +24VDC	Connect	Connect	Connect	Connect
2	**TR1**	1st signal transducer: ±10 VDC / ±20 mA maximum range, software selectable Defaults are ±10 VDC for standard and 4 ÷ 20 mA for /C option	Connect	Connect	Connect	Connect
3	**AGND**	Common GND for transducer power and signals	Connect	/	Connect	/
4	**TR2**	2nd signal transducer: ±10 VDC / ±20 mA maximum range, software selectable Defaults are ±10 VDC for standard and 4 ÷ 20 mA for /C option	/	/	Connect	Connect
5	**NC**	Not connect	/	/	/	/

Note (1) single/double transducer configuration is software selectable

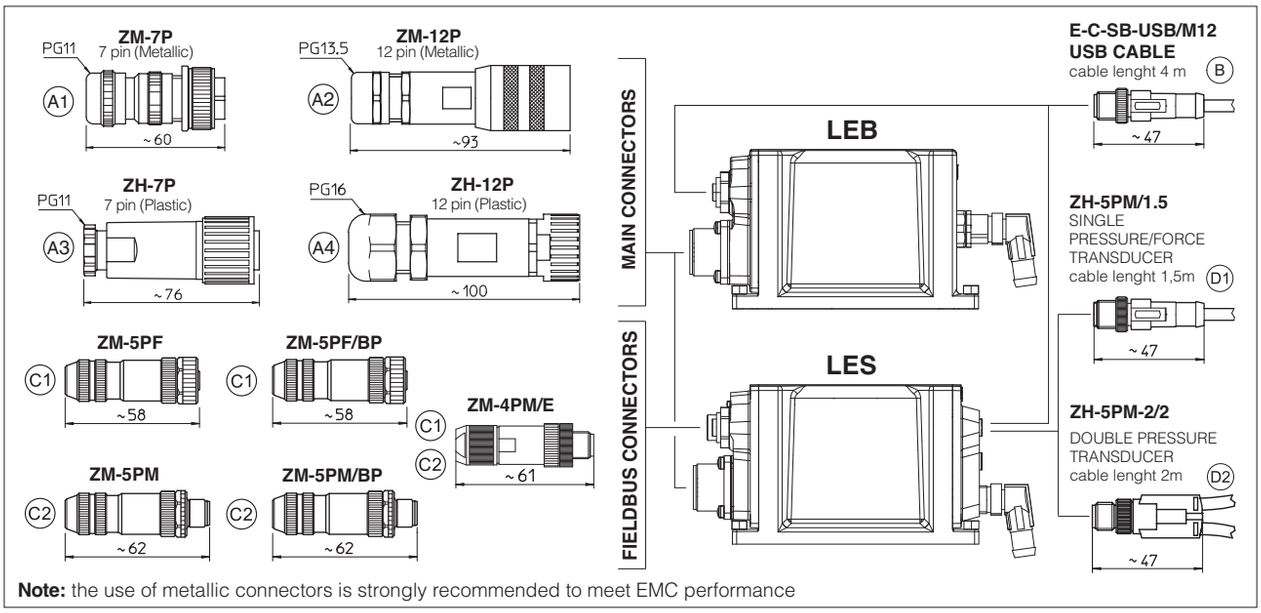
13.5 Connections layout



L LED FUNCTION DESCRIPTION

	NP, BC, BP	EH, EW, EI
L1	VALVE STATUS	LINK/ACT
L2	NETWORK STATUS	NETWORK STATUS
L3	SOLENOID STATUS	LINK/ACT

14 CONNECTORS



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

VALVE VERSION	LEB LES	LEB /Z LES /Z	BC - CANopen	BP - PROFIBUS DP	EH - EtherCat EW - POWERLINK EI - EtherNet/IP	P/Q controls SP, SL, SF
CONNECTOR CODE	ZM-7P (A1)	ZM-12P (A2)	ZM-5PF (C1)	ZM-5PF/BP (C1)	ZM-4PM/E (C1)	ZH-5PM/1.5 **(1)** (D1)
	ZH-7P (A3)	ZH-12P (A4)	ZM-5PM (C2)	ZM-5PM/BP (C2)	ZM-4PM/E (C2)	ZH-5PM-2/2 **(2)** (D2)
PROTECTION DEGREE	IP67					
DATA SHEET	GS208, GS210, GS212, K500					

only for **LES**

(1) only for SP or SL

(2) only for SF

16 PROGRAMMING TOOLS - see table **GS500**

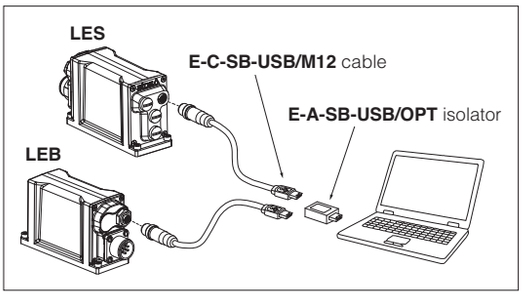
Valve's functional parameters and configurations, can be easily set and optimized using Atos E-SW programming software connected via USB port to the digital driver. For fieldbus versions, the software permits valve's parameterization through USB port also if the driver is connected to the central machine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

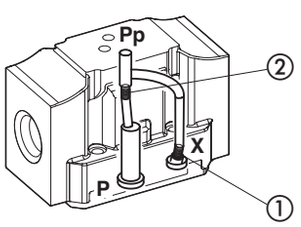
USB connection

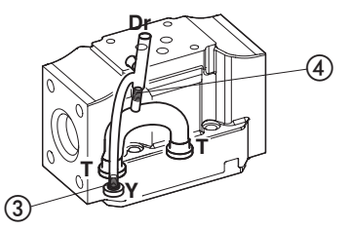


17 PLUGS LOCATION FOR PILOT/DRAIN CHANNELS

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

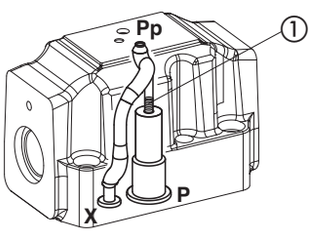
DPZO-1 **Pilot channels** **Drain channels**

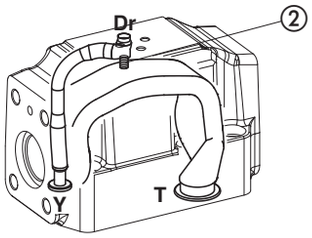




Internal piloting: blinded plug SP-X300F ① in X;
External piloting: blinded plug SP-X300F ② in Pp;
Internal drain: blinded plug SP-X300F ③ in Y;
External drain: blinded plug SP-X300F ④ in Dr.

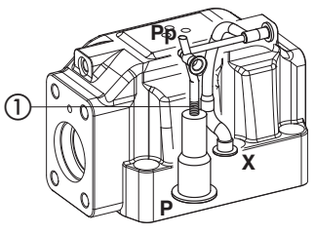
DPZO-2 **Pilot channels** **Drain channels**

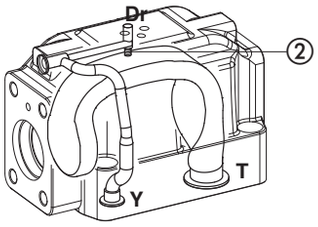




Internal piloting: Without blinded plug SP-X300F ①;
External piloting: Add blinded plug SP-X300F ①;
Internal drain: Without blinded plug SP-X300F ②;
External drain: Add blinded plug SP-X300F ②.

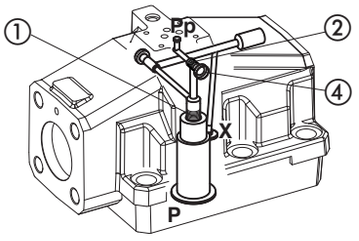
DPZO-4 **Pilot channels** **Drain channels**

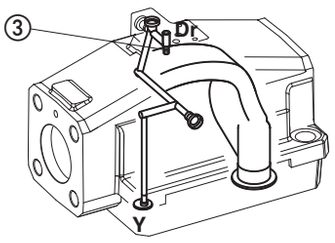




Internal piloting: Without blinded plug SP-X500F ①;
External piloting: Add blinded plug SP-X500F ①;
Internal drain: Without blinded plug SP-X300F ②;
External drain: Add blinded plug SP-X300F ②.

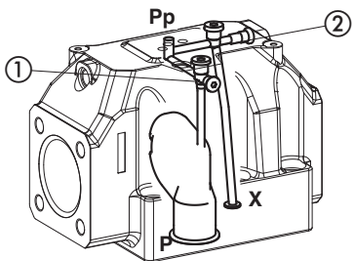
DPZO-6 **Pilot channels** **Drain channels**

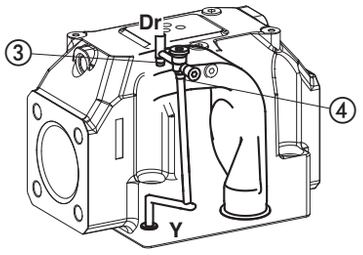




Internal piloting: Without plug ①;
External piloting: Add DIN-908 M16x1,5 in pos ①;
Internal drain: Without blinded plug SP-X300F ③;
External drain: Add blinded plug SP-X300F ③.

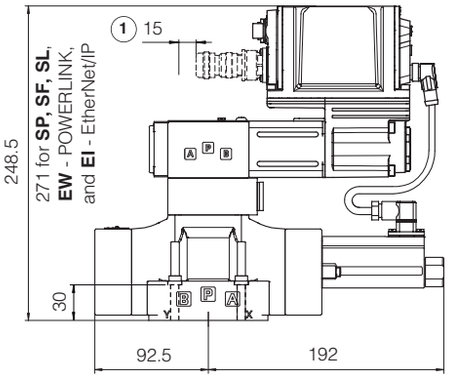
DPZO-8 **Pilot channels** **Drain channels**

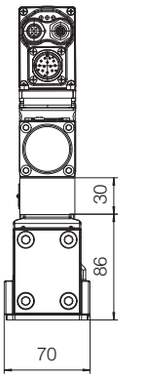




Internal piloting: Without plug ①;
External piloting: Add NPTF 1/8 in pos ①;
plug NPTF 1/8 in pos ②;
Internal drain: Without plug NPTF 1/8 in pos ③;
Add plug NPTF 1/8 in pos ④;
External drain: Add plug NPTF 1/8 in pos ③.

DPZO-LEB-*-1
DPZO-LES-*-1

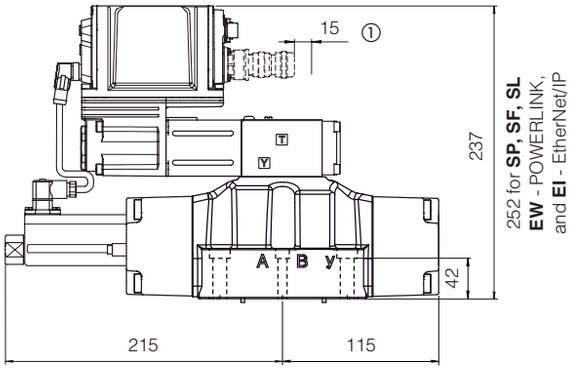


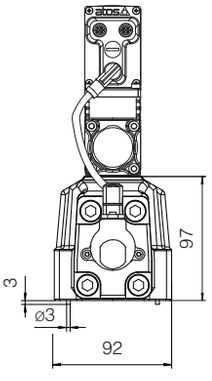


ISO 4401: 2005
Mounting surface: 4401-05-05-0-05
(see table P005)
Fastening bolts:
4 socket head screws M6x40 class 12.9
Tightening torque = 15 Nm
Seals: 5 OR 2050; 2 OR 108
Diameter of ports A, B, P, T: Ø = 11 mm;
Diameter of ports X, Y: Ø = 5 mm;

Mass 9,5 kg

DPZO-LEB-*-2
DPZO-LES-*-2

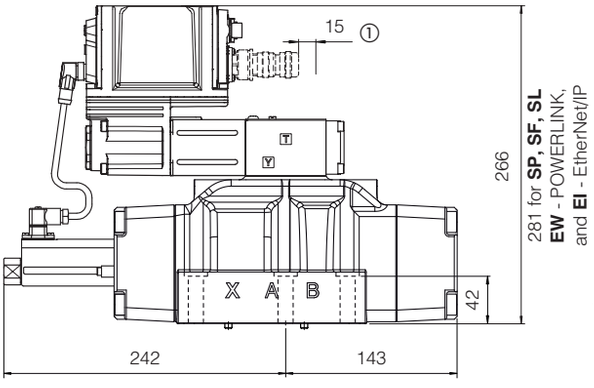


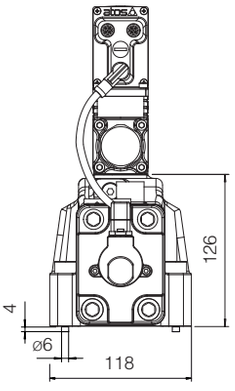


ISO 4401: 2005
Mounting surface: 4401-07-07-0-05
(see table P005)
Fastening bolts:
4 socket head screws M10x50 class 12.9
Tightening torque = 70 Nm
2 socket head screws M6x45 class 12.9
Tightening torque = 15 Nm
Seals: 4 OR 130; 2 OR 2043
Diameter of ports A, B, P, T: Ø = 20 mm;
Diameter of ports X, Y: Ø = 7 mm;

Mass 14 kg

DPZO-LEB-*-4
DPZO-LES-*-4





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: **Ø = 24 mm**;
Diameter of ports X, Y: Ø = 7 mm;

DPZO-4M
Seals: 4 OR 4131; 2 OR 3056
Diameter of ports A, B, P, T: **Ø = 32 mm;**
Diameter of ports X, Y: Ø = 7 mm;

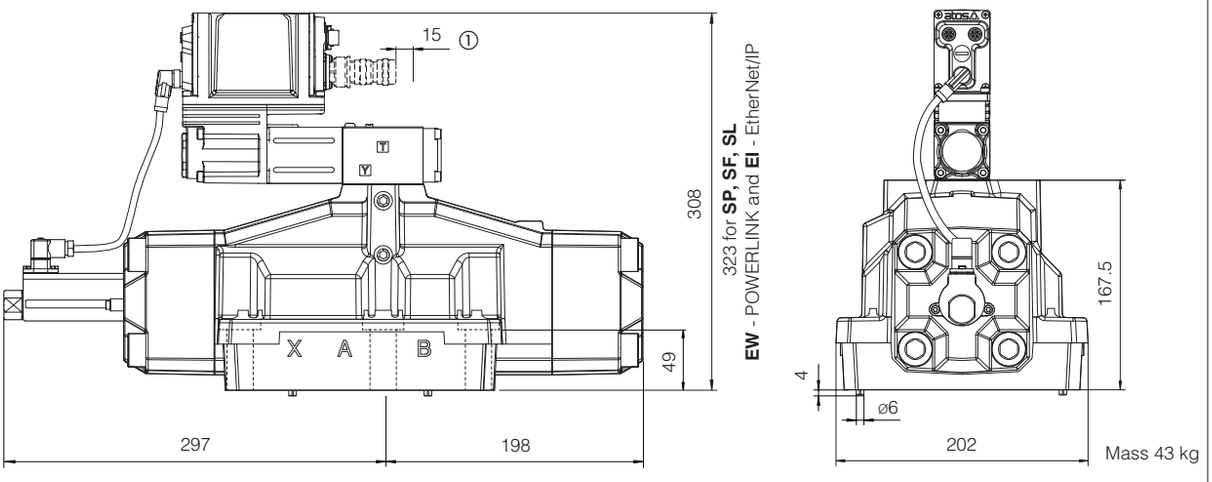
Mass 19 kg

① = Space to remove the 7 or 12 pin main connector. For main and communication connectors see section 14, 15

Note: the overall height is increased by 40 mm for /G option (0,9 kg).
For option /B the proportional solenoid, the position transducer and the electronics are at side of port B of the main stage.

DPZO-LEB-*-6
DPZO-LES-*-6

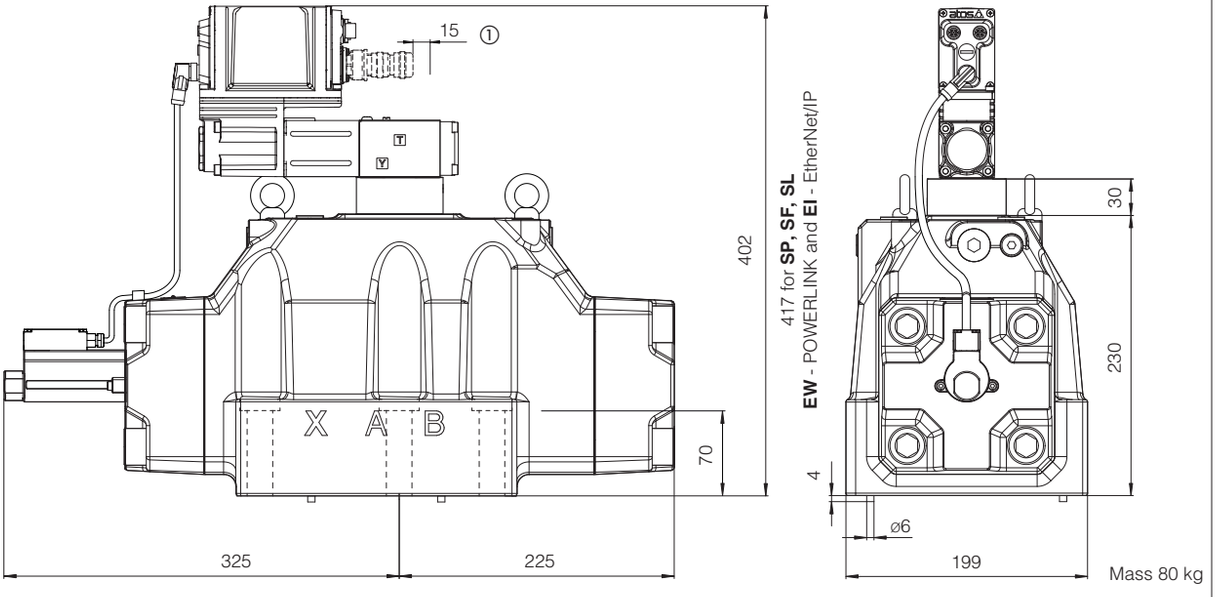
ISO 4401: 2005
Mounting surface: 4401-10-09-0-05
(see table P005)
Fastening bolts:
6 socket head screws M20x90 class 12.9
Tightening torque = 600 Nm
Diameter of ports A, B, P, T: Ø = 34 mm;
Diameter of ports X, Y: Ø = 7 mm;
Seals: 4 OR 144, 2 OR 3056



Mass 43 kg

DPZO-LEB-*-8
DPZO-LES-*-8

ISO 4401: 2005
Mounting surface: 4401-10-09-0-05
(see table P005)
Fastening bolts:
6 socket head screws M20x100 class 12.9
Tightening torque = 600 Nm
Diameter of ports A, B, P, T: Ø = 50 mm;
Diameter of ports X, Y: Ø = 9 mm;
Seals: 4 OR 156, 2 OR 3056



Mass 80 kg

① = Space to remove the 7 or 12 pin main connector. For main and communication connectors see section 14, 15

Note: the overall height is increased by 40 mm for /G option (0,9 kg).
For option /B the proportional solenoid, the position transducer and the electronics are at side of port B of the main stage.