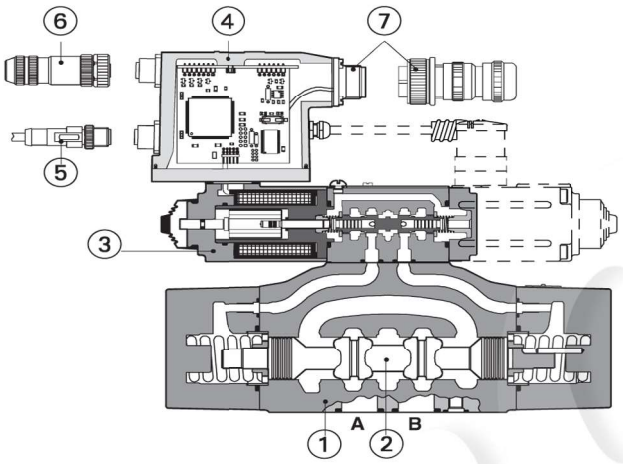
Part number:

HYDROMA HYDRAULICKÉ SYSTÉMY | HIDROMA SISTEMS UKŁADY HYDRAULICZNE | HYDROMA ГИДРАВЛИЧЕСКИЕ СИСТЕМЫ

Two stage proportional directional valves

digital, pilot operated, open loop, with **positive spool overlap**



① Valve body
② Main stage Spool
③ Pilot valve
④ Integral electronics
⑤ USB connector
⑥ Fieldbus connector
⑦ Main connector

DPZO-AES-BC-251-*
DPZO-AES-BC-271-* (dotted line)

DPZO-A, DPZO-AEB, DPZO-AES

Pilot operated digital proportional valves without position transducer and with positive spool overlap, for open loop directional controls and not compensated flow regulations.

Executions:

- **A** without integral driver, to be coupled with separated drivers, see section [2]
- **AEB** with basic integral digital electronic driver, analog reference signals and USB port for software functional parameters setting
- **AES** with full integral digital electronic driver and fieldbus interface for functional parameters setting, reference signals and real-time diagnostics

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.

Size: **10** to **32**
Max flow: **180** to **1500 l/min**
Max pressure: **350 bar**

[1] **MODEL CODE for STANDARD SPOOLS**

DPZO	-	A	ES	-	BP	-	2	71	-	L	5	/	*	/	*	*	/	*

DPZO — Two stage proportional directional valve

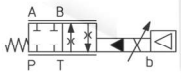
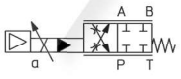
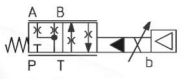
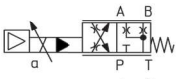
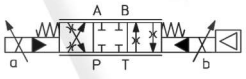
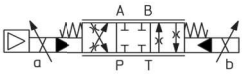
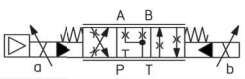
A = open loop

- = omit for execution with separated driver see section [2]
EB = basic integral driver
ES = full integral driver

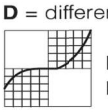
Fieldbus interfaces - USB port always present **(1)**:
NP = Not present
BP = PROFIBUS DP
BC = CANopen
EH = EtherCAT

Valve size - ISO 4401:
1 = 10 **2** = 16 **4** = 25 **6** = 32

Configuration (2):

	Standard	Option /B
51 =		
53 =		
71 =		
73 =		

Spool type - regulating characteristics:

L = linear 
S = progressive 
D = differential-progressive 
P-A = Q, B-T = Q/2
P-B = Q/2, A-T = Q

Seals material, see sect. [5], [6]:
- = NBR
PE = FKM
BT = HNBR

Series number

Coil voltage only for **A** - see sect. [9]:
see section [8]:
- = standard coil for 24V$_{DC}$ Atos drivers
6 = optional coil for 12V$_{DC}$ Atos drivers
18 = optional coil for low current drivers

Hydraulic options, see sect. [8]:
B = solenoid and integral electronics at side of port B of the main stage (side A of pilot valve) **(3)**
D = internal drain
E = external pilot pressure
G = pressure reducing valve for piloting

Electronic options, only for **AEB** and **AES** - see sect. [10]
C = current feedback 4÷20 mA for remote transducer, only in combination with option **W**
I = current reference input 4÷20 mA (omit for standard voltage reference input ±10 V)
Q = enable signal
Z = double power supply, enable, fault and monitor signals -12 pin connector
W = power limitation function - 12 pin connector

Spool size	**3** (L,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 10bar P-T

(1) Omit for **A** execution; **AEB** available only in version **NP**; **AES** available only in version **BC**, **BP**, **EH**
(2) Hydraulic symbols are represented with integral digital driver
(3) In standard configuration the solenoid (config. 51 and 53) and the integral electronics (AEB, AES) are at side A of the main stage (side B of pilot valve)

2 ELECTRONIC DRIVERS

Valve model	A										AEB	AES
Drivers model	E-MI-AC-01F		E-BM-AC-01F		E-ME-AC-01F	E-MI-AS-IR		E-BM-AS-PS		E-BM-AES	E-RI-AEB	E-RI-AES
Type	Analog					Digital						
Voltage supply (V_{DC})	12	24	12	24	24	12	24	12	24	24	24	
Valve coil option	/6	std	/6	std	std	/6	std	/6	std	std	std	
Format	plug-in to solenoid		DIN 43700 UNDECAL		EUROCARD	plug-in to solenoid		DIN-rail panel			Integral to valve	
Data sheet	G010		G025		G035	G020		G030		GS050	GS115	

Note: for main and communication connector see sections 12 , 13

3 GENERAL NOTES

DPZO-A* 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.

4 FIELDBUS - only for AES

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 valves according to EN ISO 13849	75 years, see technical table P007			
Ambient temperature range	**A**: **standard** = -20°C ÷ +70°C, **/BT** option = -40°C ÷ +60°C **AEB, AES**: **standard** = -20°C ÷ +60°C, **/BT** option = -40°C ÷ +60°C			
Storage temperature range	**A**: **standard** = -20°C ÷ +80°C, **/BT** option = -40°C ÷ +70°C **AEB, AES**: **standard** – -20°C ÷ +70°C, **/BT** option = -40°C ÷ +70°C			
Coil code	standard		option /6	option /18
Coil resistance R at 20°C	3 ÷ 3,3 Ω		2 ÷ 2,2 Ω	13 ÷ 13,4 Ω
Max. solenoid current	2,2 A		2,75 A	1 A
Max. power	**A** = 30W **AEB, AES** = 50W			
Insulation class	H (180°) Due to the occuring 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 connectors			
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 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 **P, A, B, X** = 350; **T** = 250 (10 for option /D); **Y** = 10;				
Spool type			**L5, S5, D5**	**L3, S3, D3**	**L5, S5, D5**		
Nominal flow		[l/min]					
(1)	Δp = 10 bar		100	160	250	480	640
Δp P-T	Δp = 30 bar		160	270	430	830	1100
Max permissible flow		[l/min]	180	400	550	900	1500
Piloting pressure		[bar]	min. = 25; max = 350 (option /G advisable for pilot pressure > 150 bar)				
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)**	Main stage	[l/min]	0,15/0,5	0,2/0,6		0,3/1,0	1,0/3,0
Response time **(4)** (0-100% step signal and pilot pressure 100 bar)		[ms]	< 80	< 100		< 120	< 180
Hysteresis			≤ 5 [% of max regulation]				
Repeatability			± 1 [% of max regulation]				

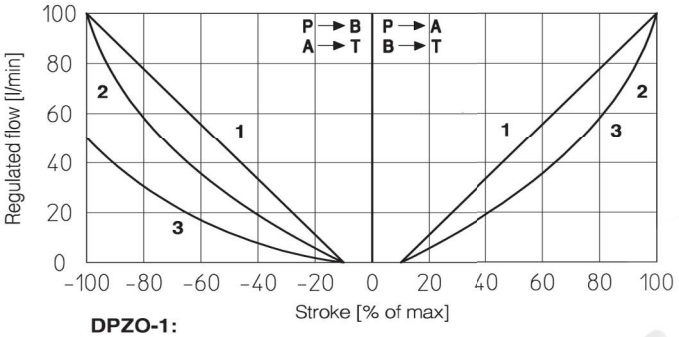
Notes: above performance data refer to valves coupled with Atos electronic drivers, see section 2.
(1) for different Δp, see section 7.2
(2) with step reference input signal 0 ÷100 %
(3) at p = 100/350 bar
(4) see detailed diagrams in section 7.3

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

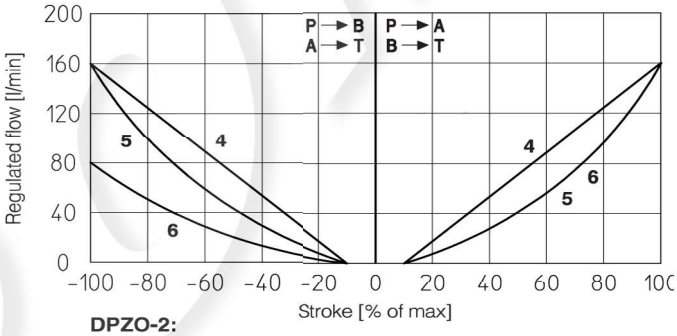
Seals, recommended fluid temperature	NBR seals (standard) = -20°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C HNBR seals (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C		
Recommended viscosity	20 ÷ 100 mm²/s - max allowed range 15 ÷ 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	

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

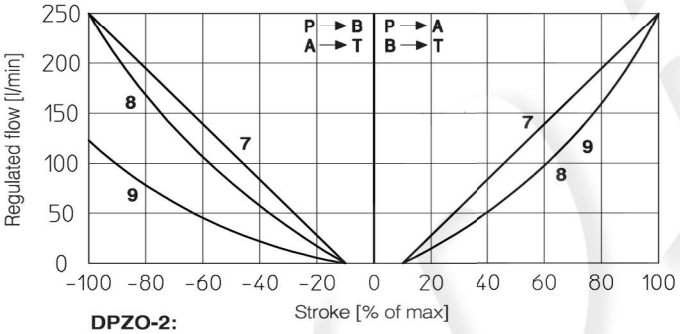
7.1 Regulation diagrams (values measure at Δp 10 bar P-T)



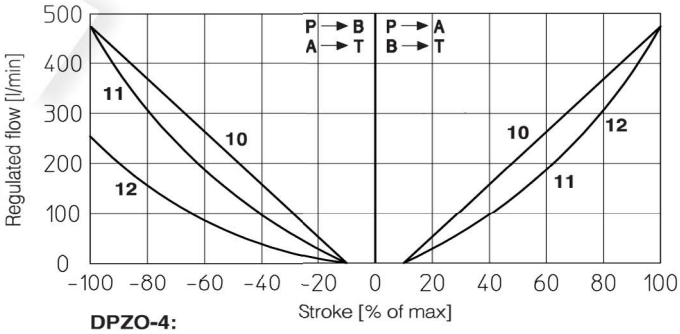
DPZO-1:
1 = L5 **2** = S5 **3** = D5



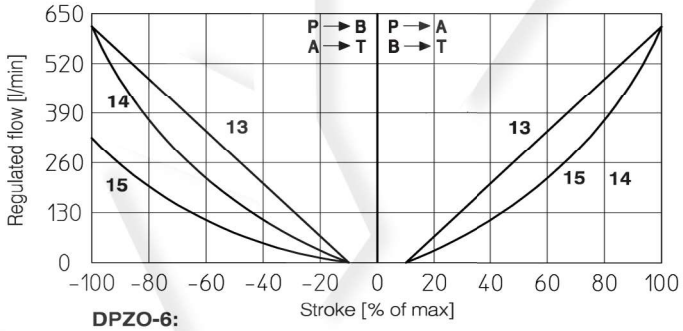
DPZO-2:
4 = L3 **5** = S3 **6** = D3



DPZO-2:
7 = L5 **8** = S5 **9** = D5



DPZO-4:
10 = L5 **11** = S5 **12** = D5



DPZO-6:
13 = L5 **14** = S5 **15** = D5

Note: Hydraulic configuration vs. reference signal for configuration 71 and 73 (standard and option /B)

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

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

7.2 Flow /Δp diagram

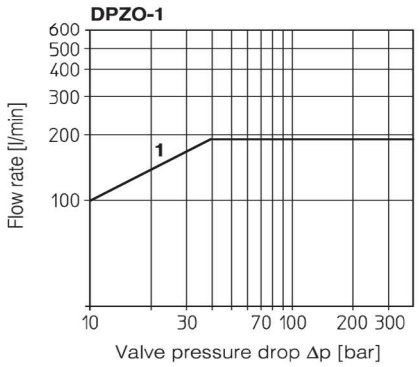
stated at 100% of spool stroke

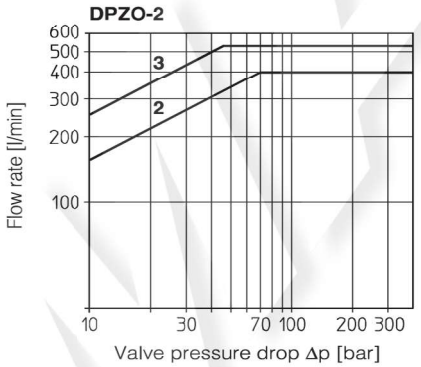
DPZO-1:
1 = spools L5, S5, D5

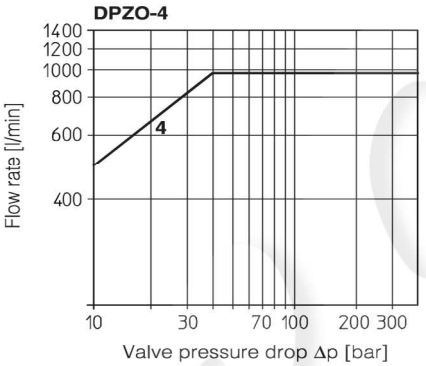
DPZO-2:
2 = spools L3, S3, D3
3 = spools L5, S5, D5

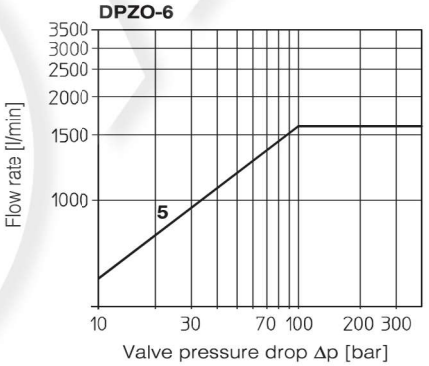
DPZO-4:
4 = spools L5, S5, D5

DPZO-6:
5 = spools L5, S5, D5



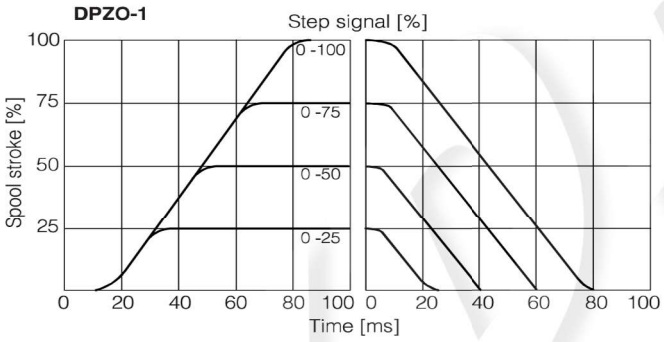


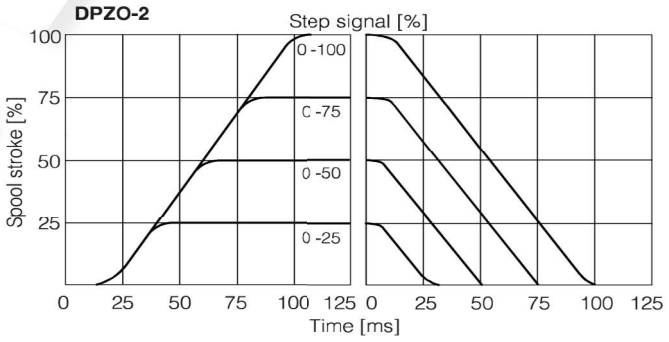


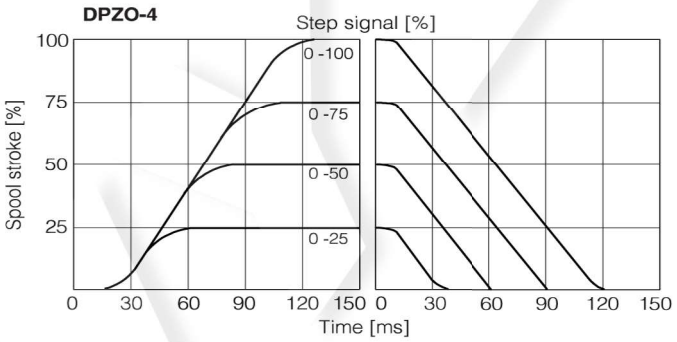


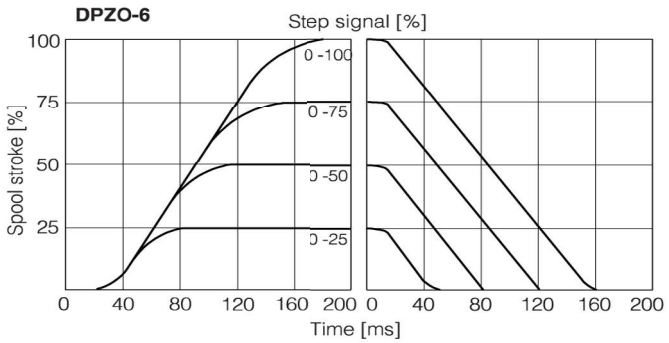
7.3 Response time (measured at pilot pressure = 100 bar)

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.



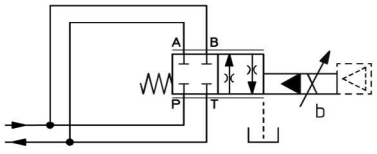






7.4 Operation as throttle valve

Single solenoid valves (*51) can be used as simple throttle valves:
Pmax = 250 bar
For this application, the use of valve -TEB or -TES (see tab. FS172) is advisable (consult our technical office)



DPZO-*-	151-L5	251-L5	451-L5	651-L5
Max flow [l/min] Δp = 30 bar	320	850	1400	2000

8 HYDRAULIC OPTIONS

8.1 Option /B

DPZO-*-*5 = solenoid and integral electronics at side of port B of the main stage.

DPZO-*-*7 = integral electronics at side of port B of the main stage.

8.2 Options /E and /D

Pilot and drain configuration can be modified as shown in 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.

8.3 Option /G

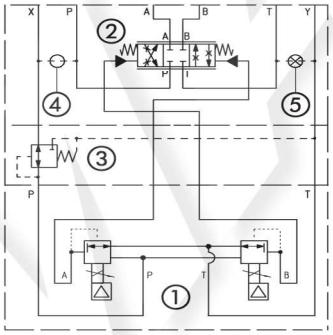
Pressure reducing valve installed between pilot valve and main body with fixed setting:

DPZO-1 and -2 = 40 bar

DPZO-4 and -6 = 100 bar

It is advisable for valves with internal pilot in case of system pressure higher than 150 bar.

FUNCTIONAL SCHEME
example of configuration 7*
3 positions, spring centered



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

9 OPTIONS for -A

9.1 Coil voltage

Option /6 optional coil to be used with Atos drivers with power supply 12 VDC

Option /18 optional coil to be used with electronic drivers not supplied by Atos

10 ELECTRONIC OPTIONS for AEB and AES

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 coil current

Monitor output signal - analog output signal proportional to the actual valve's coil current (1V monitor = 1A coil current)

Note: a minimum booting time of 500 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.

10.1 Option /I

It provides 4 ÷ 20 mA current reference 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.

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.

10.2 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).

10.3 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

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.

10.4 Option /W - only for valves coupled with pressure compensator type KC-011 or JPC-2m (see tab. D150).

It provides, on the 12 pin main connector, the above option /Z features plus the hydraulic power limitation function.

The driver receives the flow reference signal by the analog input INPUT+ and a pressure transducer, installed in the hydraulic system, has to be connected to the driver's analog input TR.

When the actual requested hydraulic power **pxQ** (TR x INPUT+) reaches the max power limit (p1xQ1), internally set by software, the driver automatically reduces the flow regulation of the valve. The higher is the pressure feedback the lower is the valve's regulated flow:

$$\text{Flow regulation} = \text{Min}\left(\frac{\text{PowerLimit [sw setting]}}{\text{Transducer Pressure [TR]}} \text{ ; Flow Reference [INPUT+]} \right)$$

For detailed information on hydraulic power limitation, see tab. GS115

10.5 Option /C - only in combination with option /W

Option /C is available to connect pressure transducer with 4 ÷ 20 mA current output signal, instead of the standard 0 ÷ 10V .

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

10.6 Possible combined options: /IQ, /IZ, /IW, /CW and /CWI

11 ELECTRONIC CONNECTIONS

11.1 Main connector signals - 7 pin - **standard** and **/Q** options - **DPZO-AEB** and **DPZO-AES** (A1)

PIN	Standard	/Q	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**		Analog ground	Gnd - analog signal
		ENABLE	Enable (24 VDC) or disable (0 VDC) the driver, referred to V0	Input - on/off signal
D	**INPUT+**		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 INPUT+	Input - analog signal
F	**MONITOR** referred to: AGND / V0		Monitor output signal: ±5 VDC maximum range Default is ± 5 VDC (1V = 1A)	Output - analog signal **Software selectable**
G	**EARTH**		Internally connected to driver housing	

11.2 Main connector signals - 12 pin - **/Z** and **/W** options - **DPZO-AEB** and **DPZO-AES** (A2)

PIN	/Z	/W	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**		Enable (24 VDC) or disable (0 VDC) the driver, referred to V0	Input - on/off signal
4	**INPUT+**		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 INPUT+	Input - analog signal
6	**MONITOR**		Monitor output signal: ±5 VDC maximum range, referred to VL0 Default is ± 5 VDC (1V = 1A)	Output - analog signal
7	**NC**		Do not connect	
8	**NC**		Do not connect	
		MONITOR2	2nd monitor output signal: ±5 VDC maximum range, default is 0 ÷ 5 VDC	Output - analog signal
9	**VL+**		Power supply 24 VDC for driver's logic and communication	Input - power supply
10	**VL0**		Power supply 0 VDC for driver's logic and communication	Gnd - power supply
11	**FAULT**		Fault (0 VDC) or normal working (24 VDC), referred to V0	Output - on/off signal
PE	**EARTH**		Internally connected to driver housing	

11.3 Communication connectors - **DPZO-AEB** (B) and **DPZO-AES** (B) - (C)

(B) **USB connector - M12 - 5 pin** always present		
PIN	**SIGNAL**	**TECHNICAL SPECIFICATION (1)**
1	**+5V_USB**	Power supply
2	**ID**	Identification
3	**GND_USB**	Signal zero data line
4	**D-**	Data line -
5	**D+**	Data line +

(C1) **BC fieldbus execution, connector - M12 - 5 pin (2)**		
PIN	**SIGNAL**	**TECHNICAL SPECIFICATION (1)**
1	**CAN_SHLD**	Shield
2	**NC**	do not connect
3	**CAN_GND**	Signal zero data line
4	**CAN_H**	Bus line (high)
5	**CAN_L**	Bus line (low)

(C2) **BP fieldbus execution, connector - M12 - 5 pin (2)**		
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**	

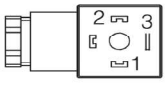
(C3) (C4) **EH fieldbus execution, connector - M12 - 4 pin (2)**		
PIN	**SIGNAL**	**TECHNICAL SPECIFICATION (1)**
1	**TX+**	Transmitter
2	**RX+**	Receiver
3	**TX-**	Transmitter
4	**RX-**	Receiver
Housing	**SHIELD**	

Notes: (1) shield connection on connector's housing is recommended **(2)** only for **AES** execution

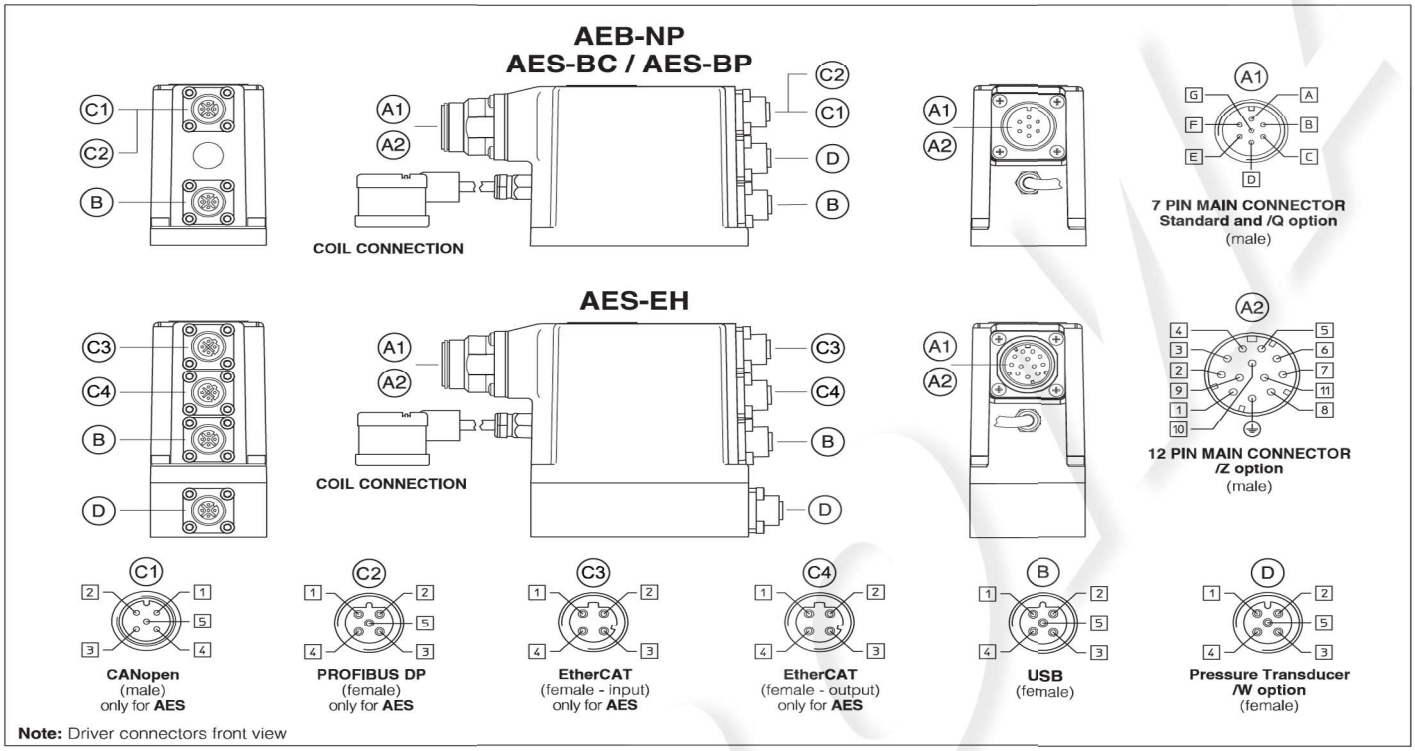
11.4 Pressure transducer connector - **M12 - 5 pin** - only for **/W** option (D)

PIN	SIGNAL	TECHNICAL SPECIFICATION	Voltage	Current
1	**VF +24V**	Power supply +24VDC	Connect	Connect
2	**TR**	Signal transducer maximum range ±10 VDC / ±20 mA, software selectable Defaults are 0 ÷ 10 VDC for standard and 4 ÷ 20 mA for /C option	Connect	Connect
3	**AGND**	Common GND for transducer power and signals	Connect	/
4	**NC**	Not Connect	/	/
5	**NC**	Not Connect	/	/

11.5 Solenoid connection - only for **DPZO-A**

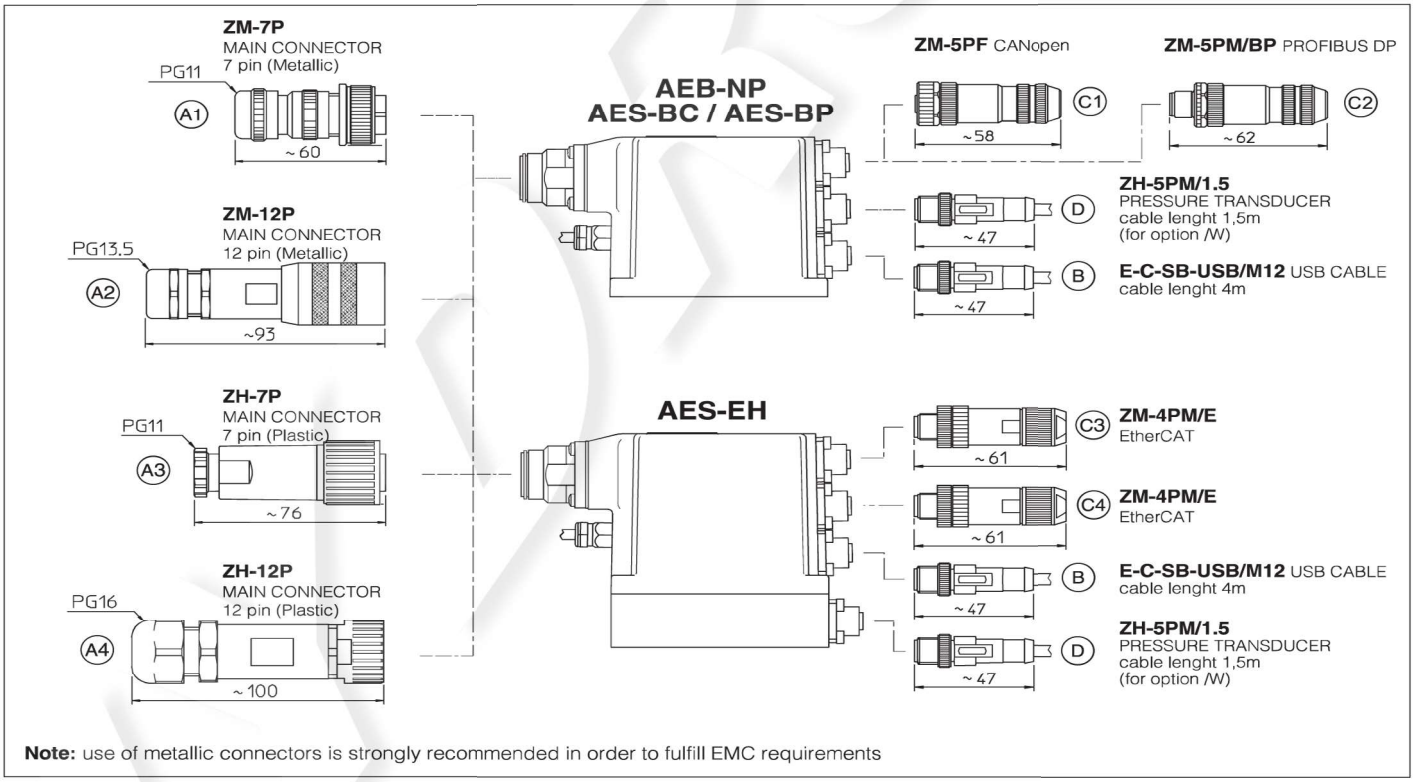
PIN	SIGNAL	TECHNICAL SPECIFICATION	Connector code 666
1	**COIL**	Power supply	
2	**COIL**	Power supply	
3	**GND**	Ground	

11.6 Connections layout - only for **AEB** and **AES**



Note: Driver connectors front view

12 CONNECTORS



Note: use of metallic connectors is strongly recommended in order to fulfill EMC requirements

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

VALVE VERSION	A (1)	AEB, AES std and /Q	AEB, AES /Z and /W	AEB, AES /W	BC - CANopen	BP - PROFIBUS DP	EH - EtherCAT
CONNECTOR CODE	666	ZM-7P (A1)	ZM-12P (A2)	ZH-5PM/1.5 (D)	ZM-5PF (C1)	ZM-5PM/BP (C2)	ZM-4PM/E (C3)
		ZH-7P (A3)	ZH-12P (A4)				ZM-4PM/E (C4)
PROTECTION DEGREE	IP67	IP67					
DATA SHEET	K500	GS115, K500					

(1) Connector supplied with the valve

only for **AES**

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

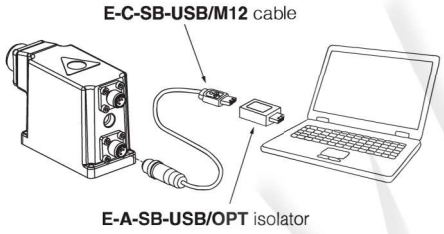
Valve's functional parameters and configurations, can be easily set and optimized using Atos E-SW programming software connected via USB port to the digital driver. For fieldbus versions, the software permits valve's parameterization through USB port also if the driver is connected to the central machine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

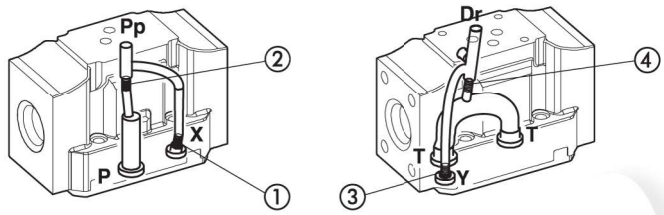
USB connection



15 PLUGS LOCATION FOR PILOT/DRAIN CHANNELS

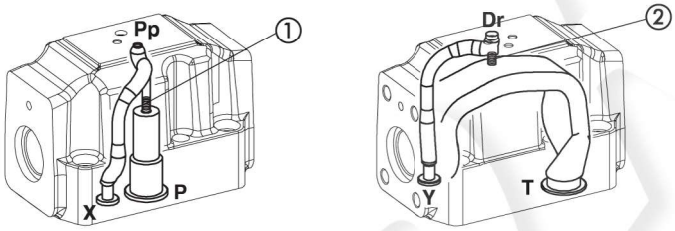
Depending on the position of internal plugs, different pilot/drain configurations can be obtained as shown below.
To modify the pilot/drain configuration, proper plugs must only be interchanged. The plugs have to be sealed using loctite 270.
Standard valves configuration provides internal pilot and external drain

DPZO-1 Pilot channels / Drain channels



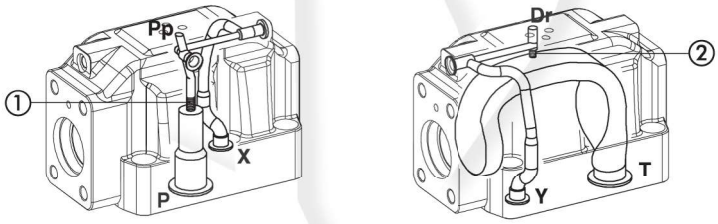
Internal piloting: blinded plug SP-X300F ① in X;
External piloting: blinded plug SP-X300F ② in Pp;
Internal drain: blinded plug SP-X300F ③ in Y;
External drain: blinded plug SP-X300F ④ in Dr.

DPZO-2 Pilot channels / Drain channels



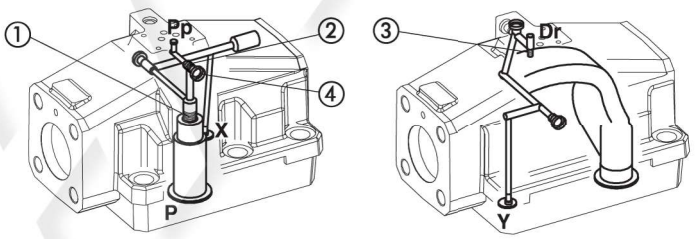
Internal piloting: Without blinded plug SP-X300F ①;
External piloting: Add blinded plug SP-X300F ①;
Internal drain: Without blinded plug SP-X300F ②;
External drain: Add blinded plug SP-X300F ②.

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;
Add plug SP-X325A in pos ②;
Internal drain: Without blinded plug SP-X300F ③;
External drain: Add blinded plug SP-X300F ③.

To reach the orefice ② remove plug ④ = G1/8"

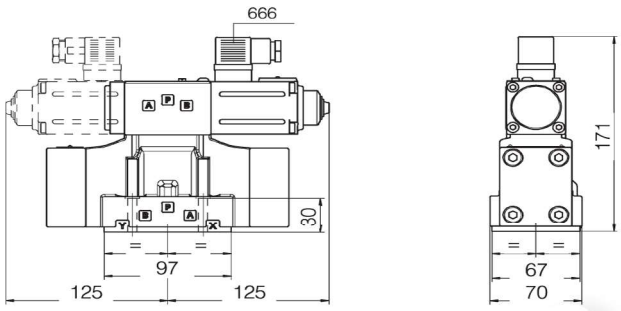
16 INSTALLATION DIMENSIONS FOR DPZO-1 [mm]

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;

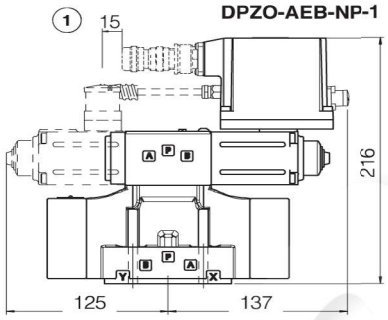
Mass [kg]

	A	AEB, AES	AES-EH
DPZO-*-15*	7,7	8,1	8,2
DPZO-*-17*	8,6	9	9,1
Option /G		+0,9	

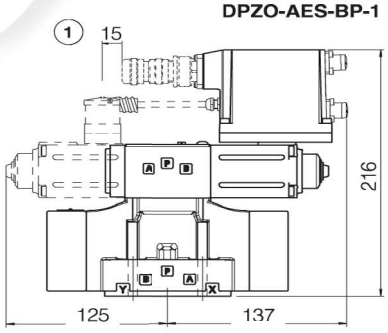
DPZO-A-1



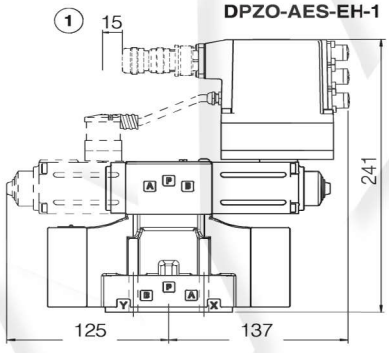
DPZO-AEB-NP-1



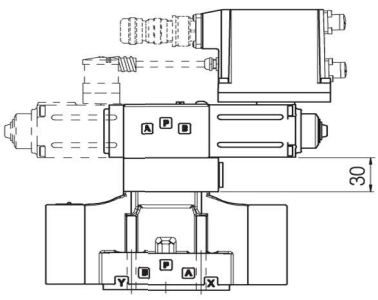
DPZO-AES-BC-1
DPZO-AES-BP-1



DPZO-AES-EH-1



option /G



Dotted line = double solenoid version

(1) = Space to remove the 7 or 12 pin main connector. For main and communication connector see section 12 , 13

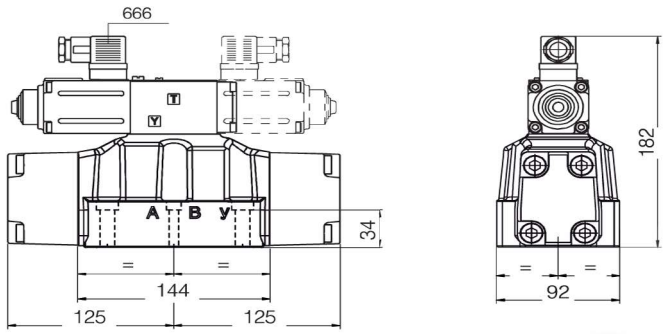
17 INSTALLATION DIMENSIONS FOR DPZO-2 [mm]

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; 3 OR 109/70
Diameter of ports A, B, P, T: Ø = 20 mm;
Diameter of ports X, Y: Ø = 7 mm;

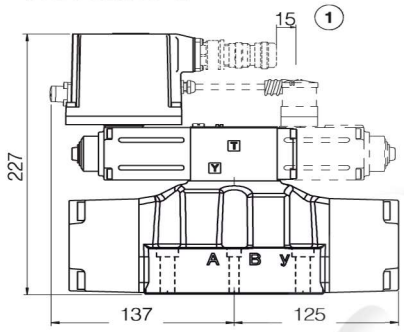
Mass [kg]

	A	AEB, AES	AES-EH
DPZO-*-25*	11,9	12,3	12,4
DPZO-*-27*	12,8	13,2	13,3
Option /G		+0,9	

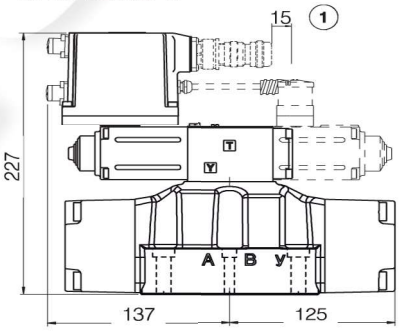
DPZO-A-2



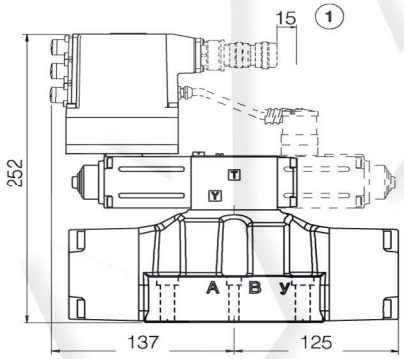
DPZO-AEB-NP-2



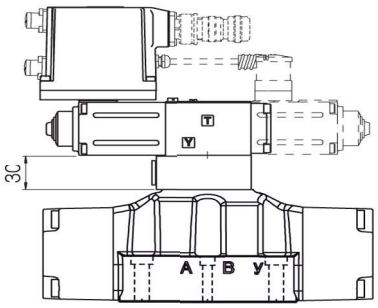
DPZO-AES-BC-2
DPZO-AES-BP-2



DPZO-AES-EH-2



option /G



Dotted line = double solenoid version

1 = Space to remove the 7 or 12 pin main connector. For main and communication connector see section 12 , 13

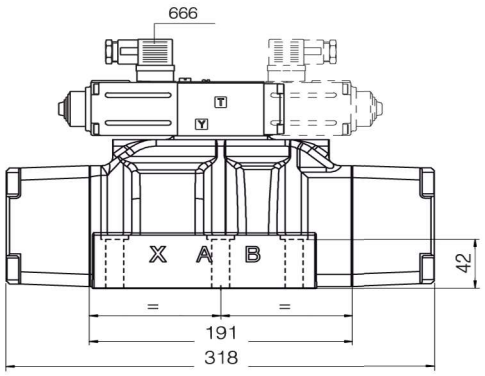
18 INSTALLATION DIMENSIONS FOR DPZO-4 [mm]

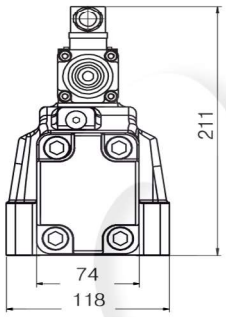
ISO 4401: 2005
Mounting surface: 4401-08-08-0-05 (see table P005)
Fastening bolts:
6 socket head screws M12x60 class 12.9
Tightening torque = 125 Nm
Seals: 4 OR 4112; 2 OR 3056
Diameter of ports A, B, P, T: Ø = 24 mm;
Diameter of ports X, Y: Ø = 7 mm;

Mass [kg]

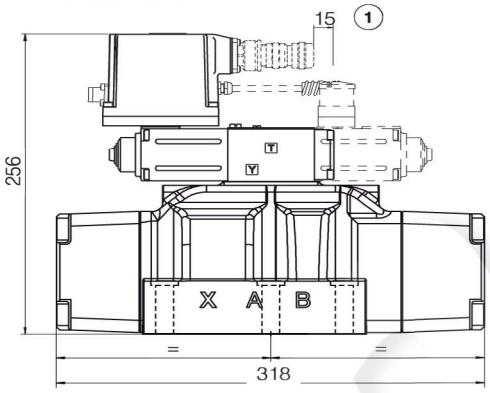
	A	AEB, AES	AES-EH
DPZO-*-45*	17,1	18	18,1
DPZO-*-47*	18	18,9	19
Option /G	+0,9		

DPZO-A-4

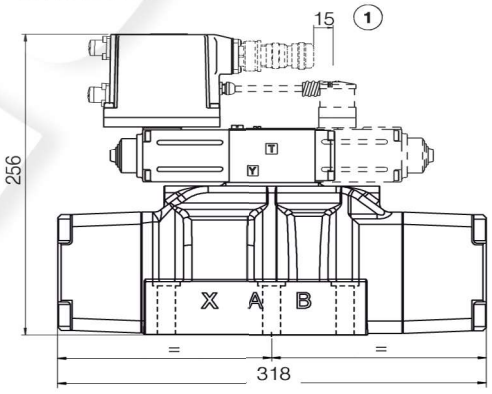




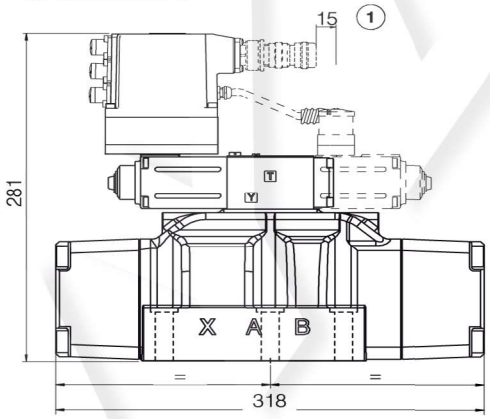
DPZO-AEB-NP-4



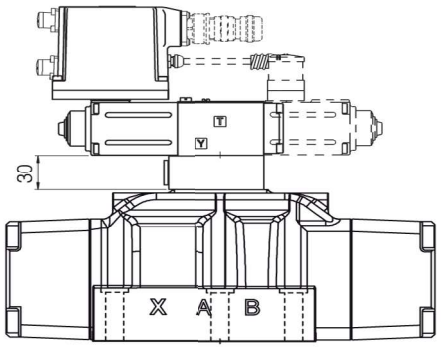
DPZO-AES-BC-4
DPZO-AES-BP-4



DPZO-AES-EH-4



option /G



Dotted line = double solenoid version

(1) = Space to remove the 7 or 12 pin main connector. For main and communication connector see section 12 , 13

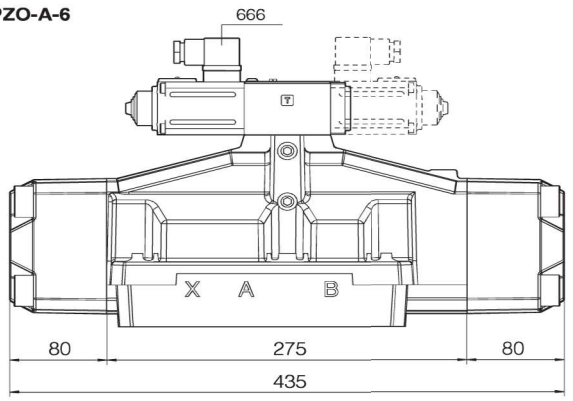
19 INSTALLATION DIMENSIONS FOR DPZO-6 [mm]

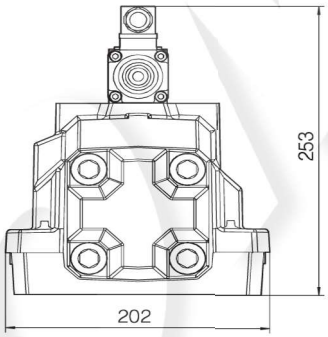
ISO 4401: 2005
Mounting surface: 4401-10-09-0-05
Fastening bolts:
6 socket head screws M20x90 class 12.9
Tightening torque = 600 Nm
Diameter of ports A, B, P, T: Ø = 34 mm;
Diameter of ports X, Y: Ø = 7 mm;
Seals: 4 OR 144, 3 OR 3056

Mass [kg]

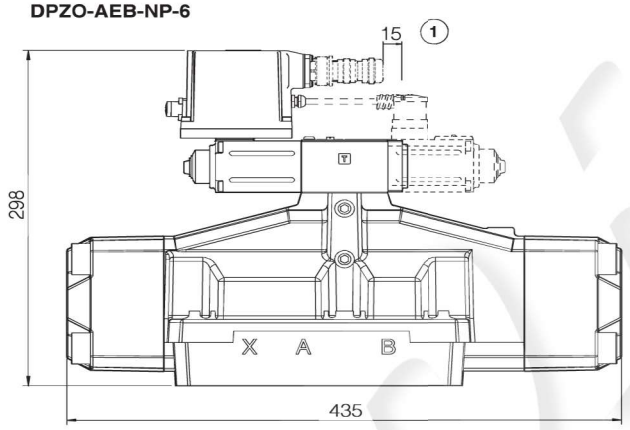
	A	AEB, AES	AES-EH
DPZO-*-65*	42,1	42,5	42,6
DPZO-*-67*	42,7	43,1	43,2
Option /G	+2,3		

DPZO-A-6

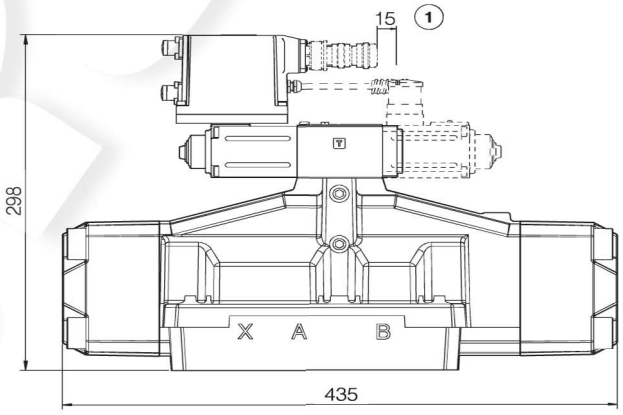




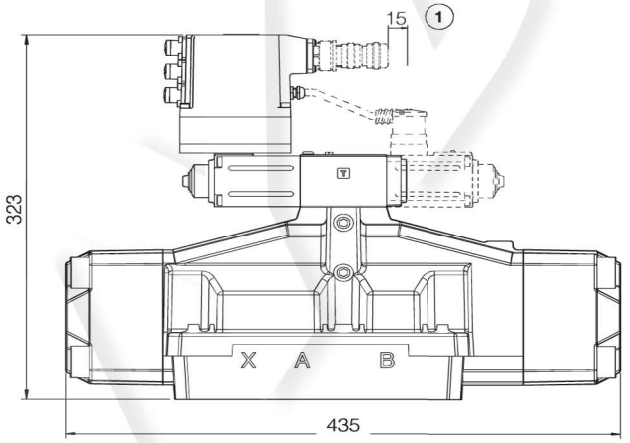
DPZO-AEB-NP-6



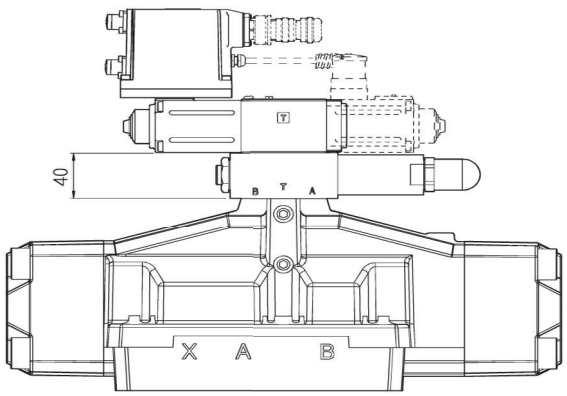
DPZO-AES-BC-6
DPZO-AES-BP-6



DPZO-AES-EH-6



option /G



Dotted line = double solenoid version

(1) = Space to remove the 7 or 12 pin main connector. For main and communication connector see section 12 , 13