

# DXPE\*J

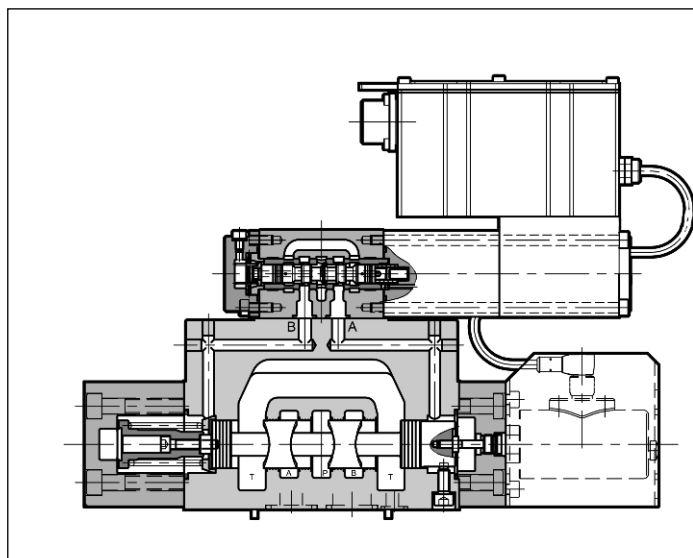
## DIRECTIONAL CONTROL VALVE PILOT OPERATED, WITH OBE AND FEEDBACK SERIES 31

### SUBPLATE MOUNTING

DXPE5J	CETOP P05
DXPE5RJ	ISO 4401-05
DXPE7J	ISO 4401-07
DXPE8J	ISO 4401-08

**p** max (see performance table)  
**Q** max (see performance table)

### OPERATING PRINCIPLE



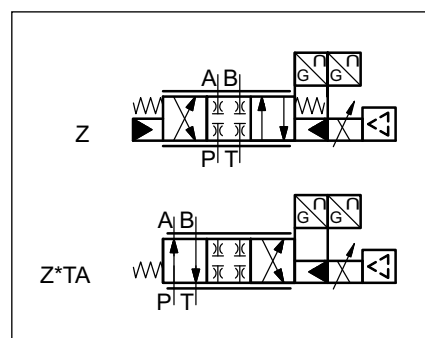
- DXPE\*J are directional control valves operated by a servo-proportional pilot, with mounting surface compliant with ISO 4401 standards.
- The spool position is controlled by a linear transducer LVDT in closed loop, which ensures high precision and repeatability. In the event of switch-off or inactive electronics the main spool is set to a fail-safe position by springs.
- The valve is featured by integral electronic based on SMD technology which ensures standard regulations and simplifies the electric wiring. The unit does not require any adjustment.
- The valve is easy to install. The driver directly manages digital settings. In the event of special applications, you can customize the settings using the optional kit (see par. 15.3).

### PERFORMANCES

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

		DXPE5J DXPE5RJ	DXPE7J	DXPE8J
Max operating pressure: P - A - B ports T - X - Y ports	bar	350 250		
Controlled flow with $\Delta p$ 10 bar P-T	l/min	100	220	400
Hysteresis	% Q max	< 0,2%		
Repeatability	% Q max	$\pm 0,1\%$		
Electrical characteristics		see paragraph 3		
Ambient temperature range	°C	-20 / +60		
Fluid temperature range	°C	-20 / +80		
Fluid viscosity range	cSt	10 ÷ 400		
Fluid contamination degree		according to ISO 4406:1999 class 17/15/12 (16/14/11 for longer life)		
Recommended viscosity	cSt	25		
Mass	kg	8	10,5	17

### HYDRAULIC SYMBOLS (typical)





## 1 - IDENTIFICATION CODE

D	X	P	E		J	-			/	31	-			/		K11	
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Proportional directional valve with high-response pilot

Nominal size: \_\_\_\_\_  
**5** = CETOP P05  
**5R** = ISO 4401-05  
**7** = ISO 4401-07  
**8** = ISO 4401-08

Digital integrated electronics for valves with feedback

Spool type: \_\_\_\_\_  
**Z\*** = zero overlap  
**Z\*TA** = zero overlap  
See paragraph 2 for operation and available flow rates.  
Other spool types (C, A.. ) are available upon request.

Option:  
/ **W7** = Zinc-nickel surface treatment  
Omit if not required. (see par. 1.1)

Pin C function:  
**A** = external enable  
**B** = internal enable  
**C** = 0V monitor

Main connector:  
6 pin + PE

Reference signal:  
**E0** = voltage  $\pm 10V$   
**E1** = current  $4 \pm 20\text{ mA}$

Drainage: **I** = internal  
**E** = external

Piloting: **I** = internal  
**E** = external

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

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

### 1.1 - Surface treatments

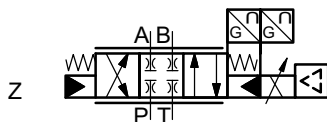
The standard valve is supplied with surface treatment of phosphating black.

The zinc-nickel finishing makes the valve suitable to ensure a salt spray resistance up to **600** hours (test operated according to UNI EN ISO 9227 standards and test evaluation operated according to UNI EN ISO 10289 standards).

## 2 - AVAILABLE CONFIGURATIONS

The valve configuration depends on the combination of spool type and rated flow.

### 3 positions with spring centering

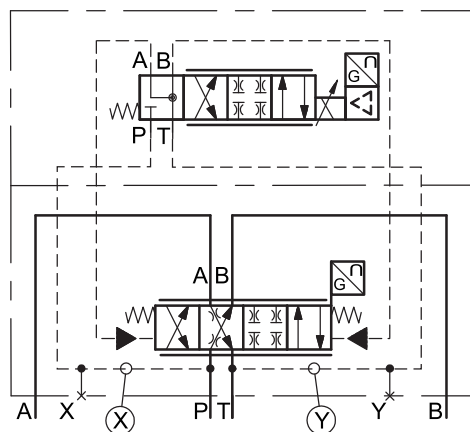


valve type	Z*	Controlled flow with $\Delta p$ 10 bar P-T
DXPE5J DXPE5RJ	100	100 l/min
DXPE7J	120	120 l/min
	220	220 l/min
DXPE8J	250	250 l/min
	400	400 l/min

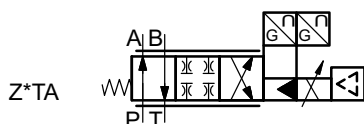
### OFFSET POSITION

After electrical switch-off or Enable signal switch-off (version K11A) the main spool moves to springs offset position, with limited opening (1%...6% of main spool stroke in direction P-B / A-T)

detailed symbol



### 3 positions with spring offset

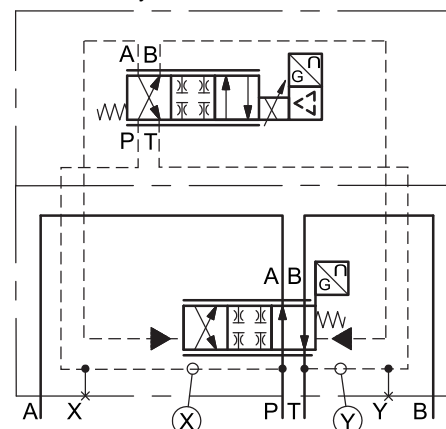


valve type	Z*TA	Controlled flow with $\Delta p$ 10 bar P-T
DXPE5J DXPE5RJ	100	100 l/min
DXPE7J	120	120 l/min
	220	220 l/min
DXPE8J	250	250 l/min
	400	400 l/min

### FAIL SAFE POSITION

After electrical switch-off or Enable signal switch-off (version K11A) the main spool moves by spring to the fail-safe position P - A / B -T, wide open.

detailed symbol





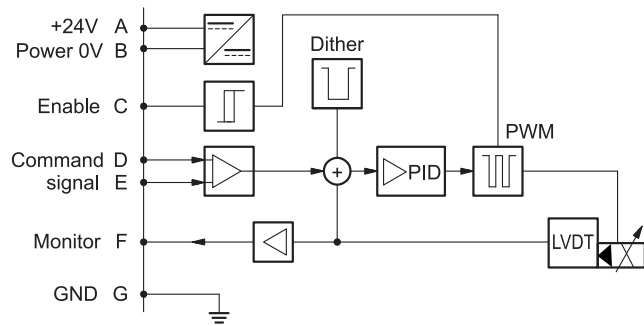
## 3 - ELECTRICAL CHARACTERISTICS

### 3.1 - Electrical on board electronics

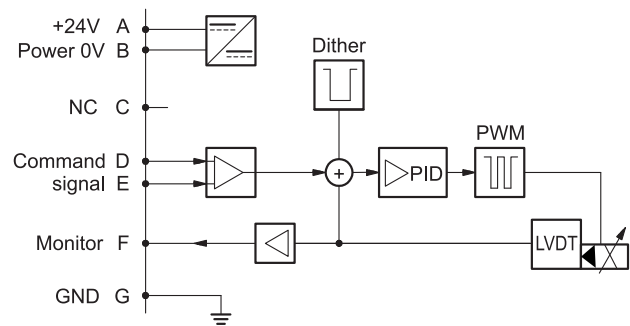
Duty cycle		100% (continuous operation)
Protection class according to EN 60529		IP65 / IP67
Supply voltage	V DC	24 (from 19 to 30 VDC), ripple max 3 Vpp
Power consumption	VA	35
Maximum solenoid current	A	2.6
Fuse protection, external		fast, max current 4A
Command signals: voltage (E0) current (E1)	V DC mA	$\pm 10$ (Impedance $R_i > 11 \text{ k}\Omega$ ) $4 \div 20$ (Impedance $R_i = 58 \text{ }\Omega$ )
Monitor signals: voltage (E0) current (E1)	V DC mA	$\pm 10$ (Impedance $R_o > 1 \text{ k}\Omega$ ) $4 \div 20$ (Impedance $R_o = 500 \text{ }\Omega$ )
Managed breakdowns		Overload and electronics overheating, LVDT sensor error, cable breakdown, supply voltage failure
Communication		LIN-bus Interface (with the optional kit)
Connection		7 - pin MIL-C-5015-G (DIN-EN 175201-804)
Electromagnetic compatibility (EMC)		According to 2014/30/EU standards (testing accordingly: IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8)

### 3.2 - On-board electronics diagrams

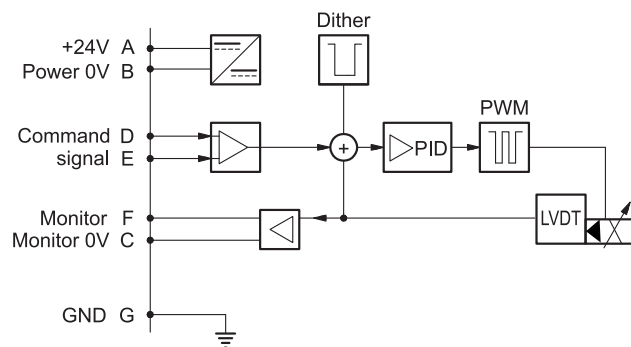
VERSION A - External Enable



VERSION B - Internal Enable

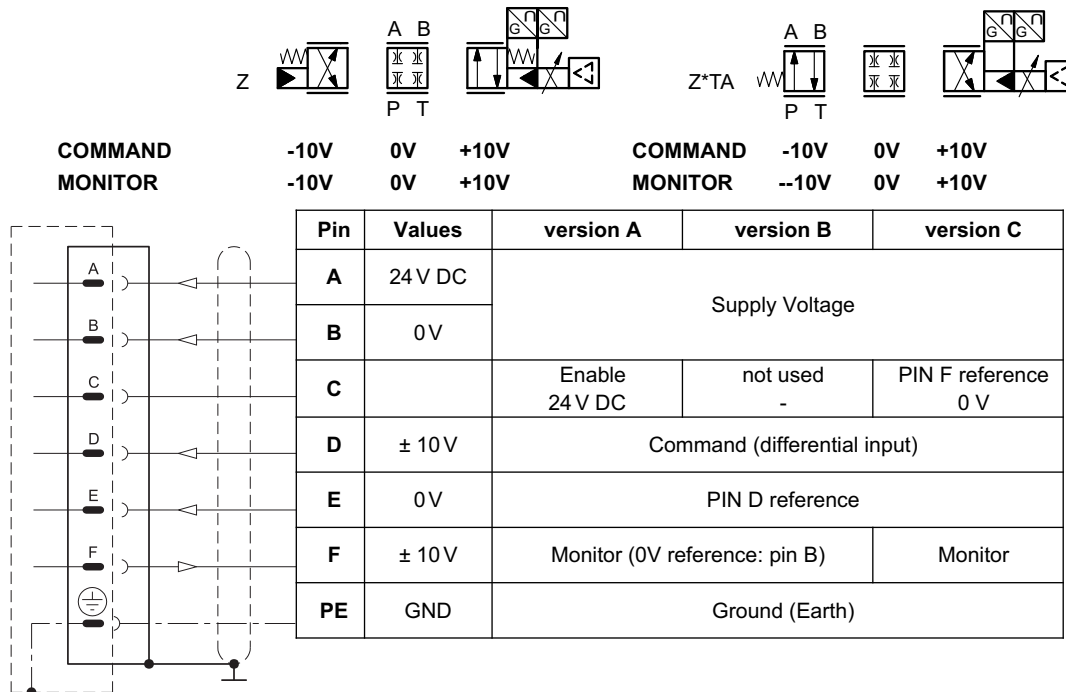


VERSION C - 0V Monitor



## 4 - VERSIONS WITH VOLTAGE COMMAND (E0)

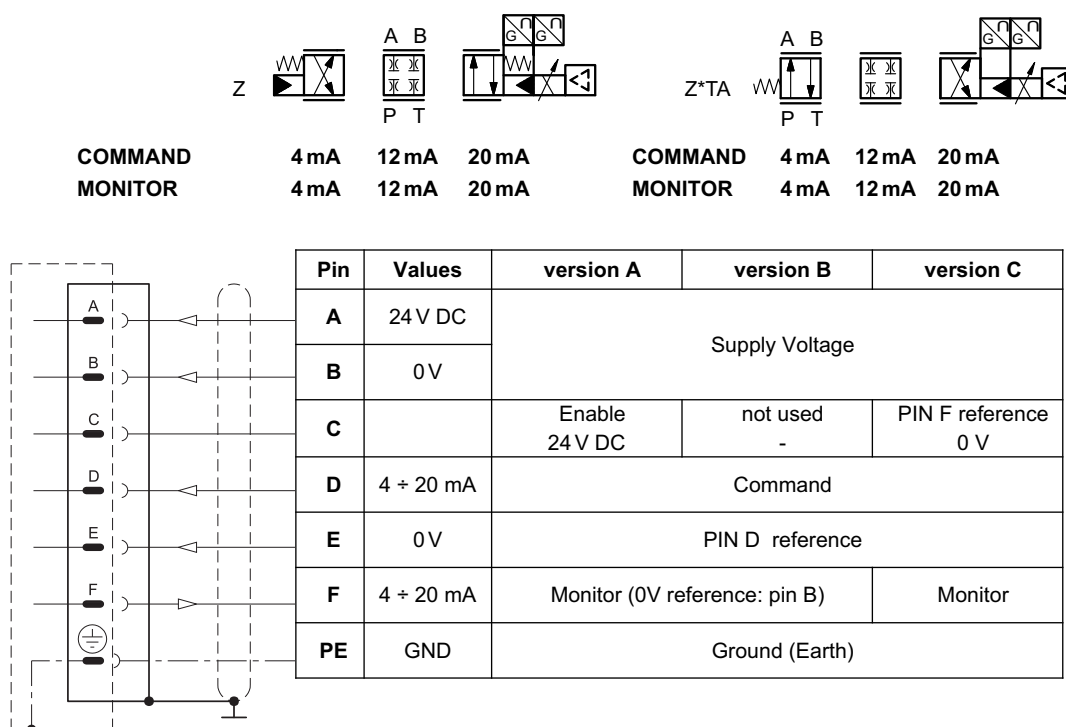
The reference signal must be between -10V and +10V. The monitor feature of versions B and C becomes available with a delay of 0,5 sec from the power-on of the card.



## 5 - VERSIONS WITH CURRENT COMMAND (E1)

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

The monitor feature of versions B and C becomes available with a delay of 0,5 sec from the power-on of the card.



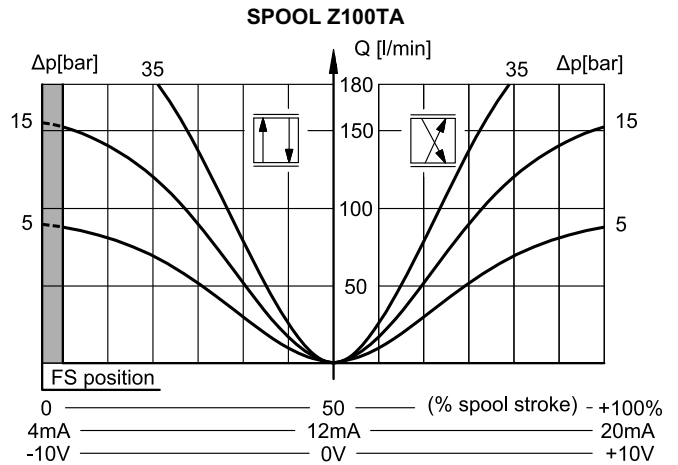
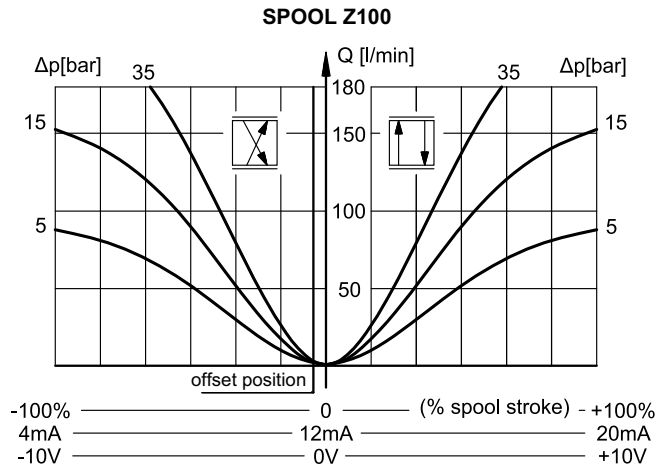


### 6 - CHARACTERISTIC CURVES

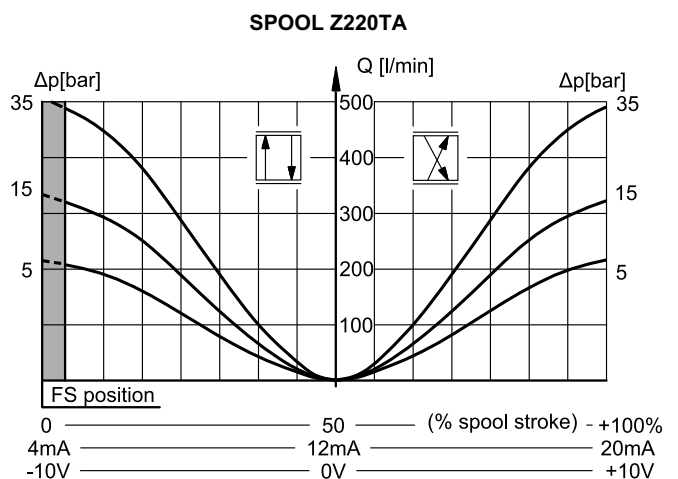
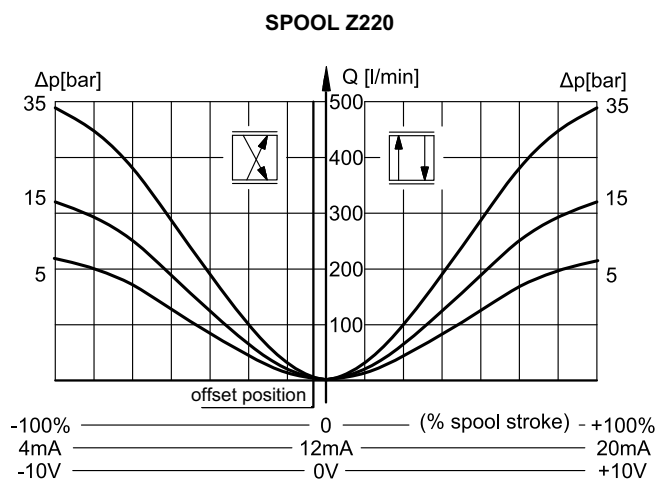
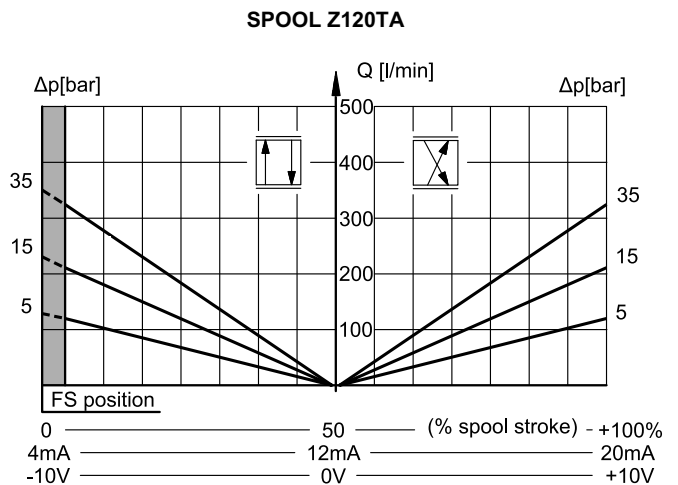
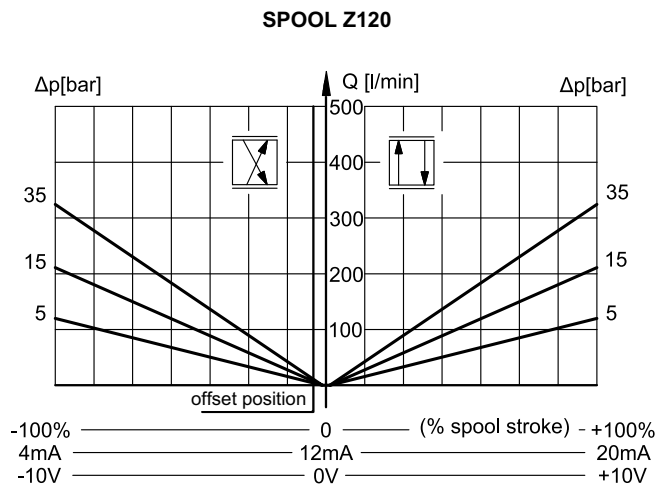
(with mineral oil with viscosity of 36 cSt at 50°C)

Typical flow rate curves at constant  $\Delta p$  related to the reference signal and measured for the available spools.  
The  $\Delta p$  values are measured per land.

#### 6.1 - Characteristic curves DXPE5J and DXPE5RJ

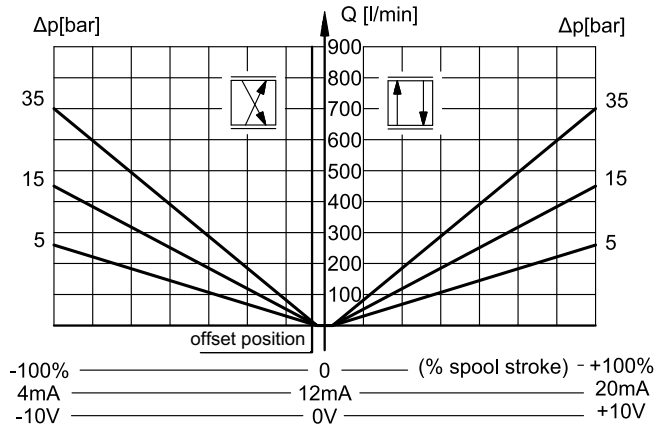


#### 6.2 - Characteristic curves DXPE7J

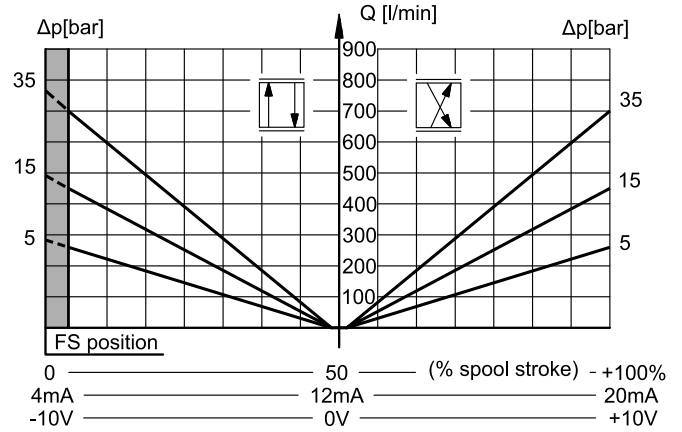


## 6.3 - Characteristic curves DXPE8J

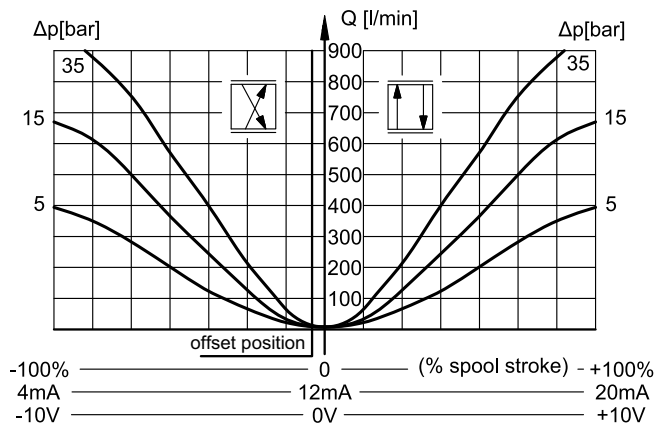
**SPOOL Z250**



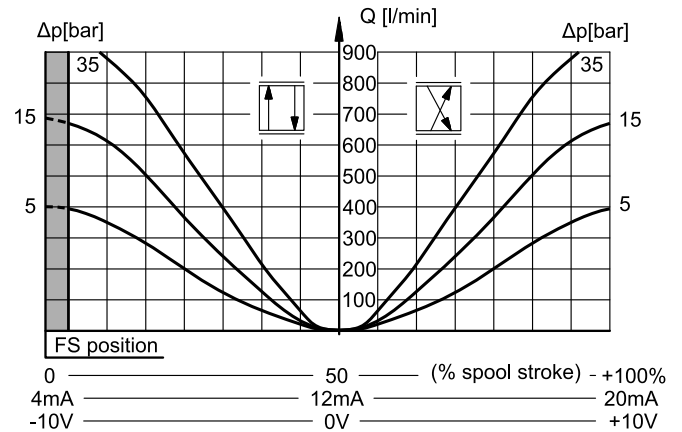
**SPOOL Z250TA**



**SPOOL Z400**



**SPOOL Z400TA**





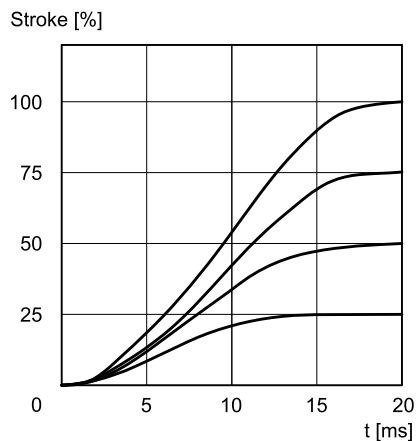
## 7 - RESPONSE TIMES

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

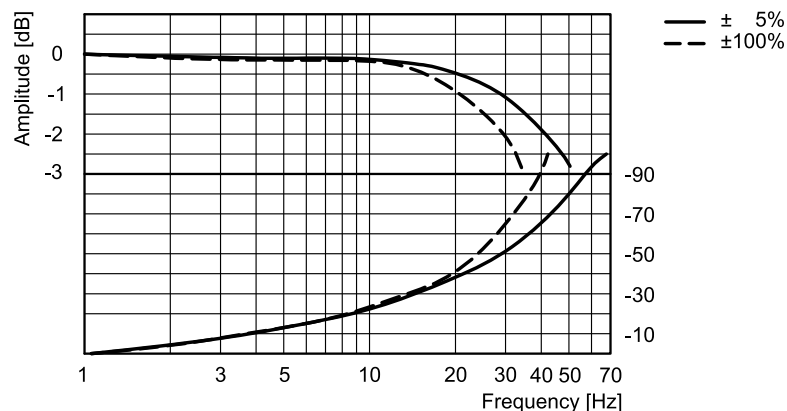
The tables shows the typical step response tested with static pressure 100 bar.

### 7.1 - DXPE5J and DXPE5RJ

RESPONSE TIME

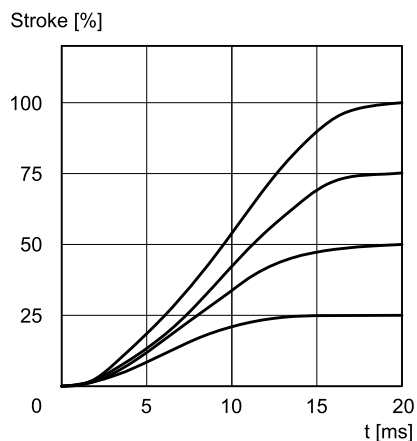


FREQUENCY RESPONSE

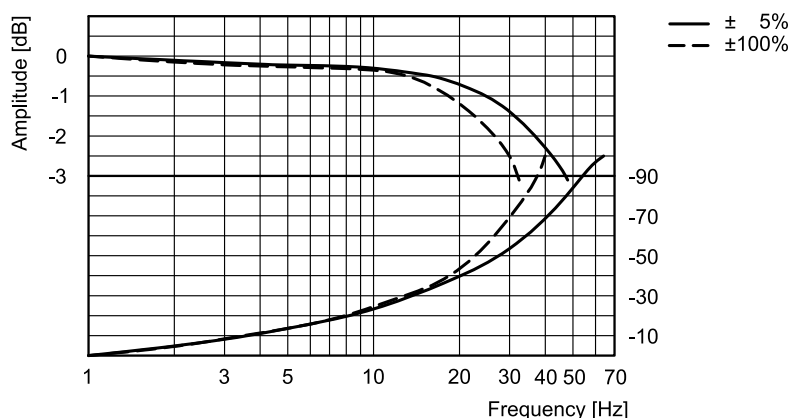


### 7.2 - DXPE7J

RESPONSE TIME

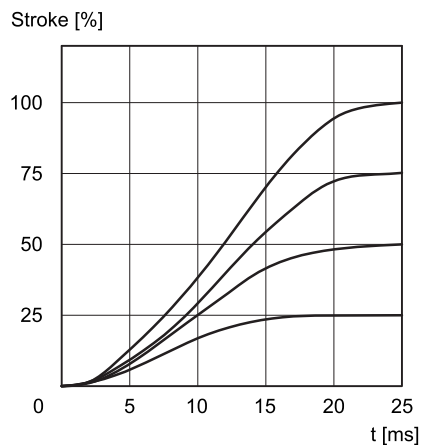


FREQUENCY RESPONSE

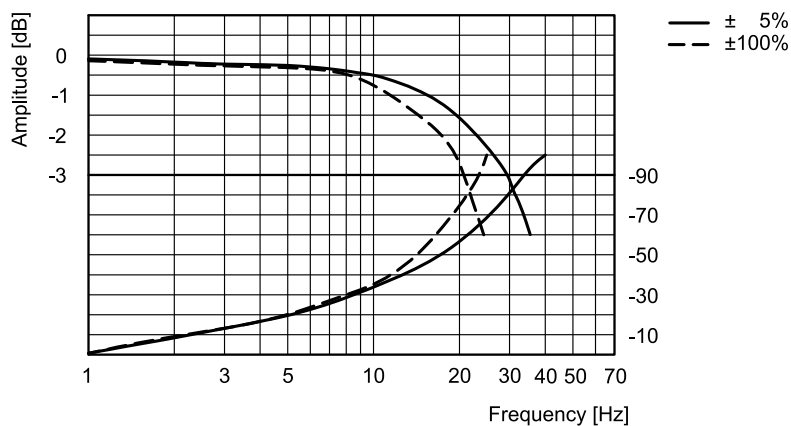


### 7.3 - DXPE8J

RESPONSE TIME



FREQUENCY RESPONSE





## 8 - HYDRAULIC CHARACTERISTICS

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

		DXPE5J DXPER5J	DXPE7J	DXPE8J
Max flow rate	l/min	180	450	900
Piloting flow requested with operation 0 → 100%	l/min	7	13	28
Piloting volume requested with operation 0 → 100%	cm <sup>3</sup>	1,7	3,2	10

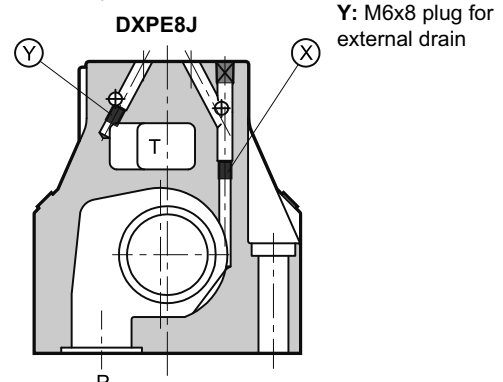
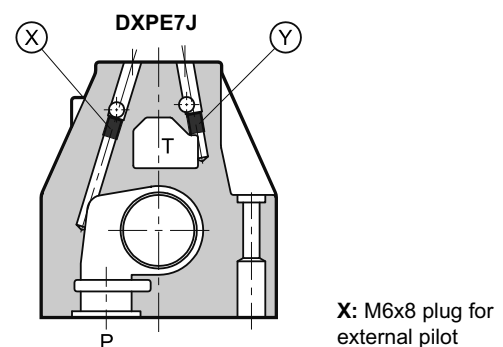
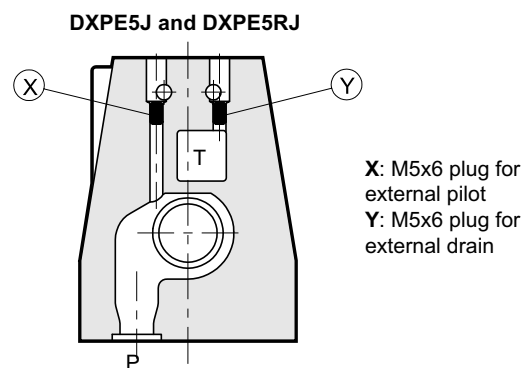
### 8.1- Piloting and drainage

The DXPE\*J valves are available with piloting and drainage, both internal and external. The version with external drainage allows a higher back pressure on the unloading. The version with external pilot with reduced pressure must be used when higher pressures are needed.

	TYPE OF VALVE	Plug assembly	
		X	Y
<b>IE</b>	INTERNAL PILOT AND EXTERNAL DRAIN	NO	YES
<b>II</b>	INTERNAL PILOT AND INTERNAL DRAIN	NO	NO
<b>EE</b>	EXTERNAL PILOT AND EXTERNAL DRAIN	YES	YES
<b>EI</b>	EXTERNAL PILOT AND INTERNAL DRAIN	YES	NO

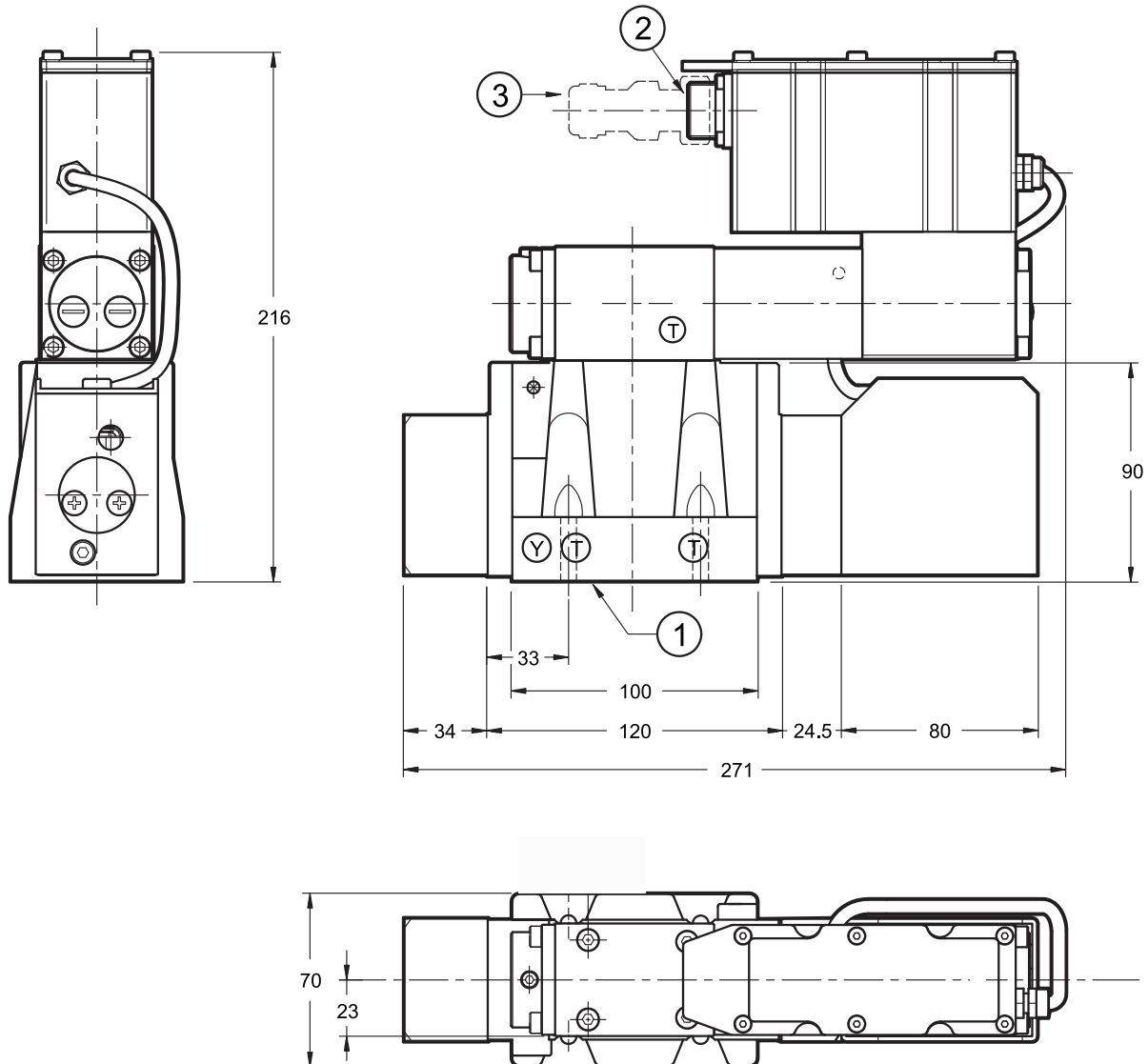
### PRESSURES (bar)

Pressure	MIN	MAX
Piloting pressure on X port	15	250
Pressure on T port with internal drain	-	30
Pressure on T port with external drain	-	250



## 9 - OVERALL AND MOUNTING DIMENSIONS DXPE5J AND DXPE5RJ

dimensions in mm



### NOTES:

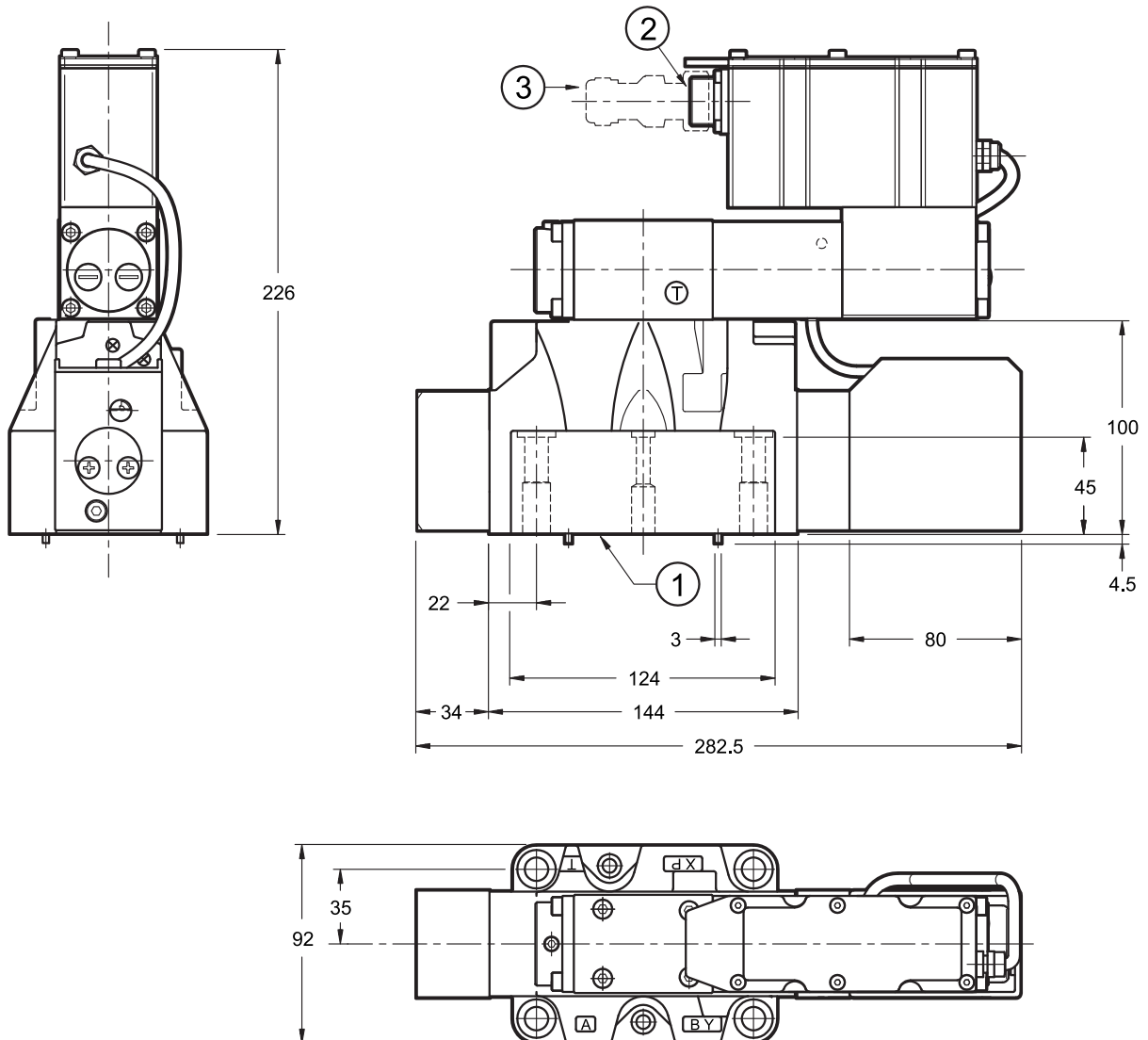
- See mounting surface at paragraph 12.
- Do not dismantle the transducers.

Valve fastening: N. 4 bolts M6x35 - ISO 4762
Tightening torque: 8 Nm (bolts A 8.8)
Threads of mounting holes: M6x10

1	Mounting surface with sealing rings: 5 OR type 2050 (12.42x1.78) - 90 Shore 2 OR type 2037 (9.25x1.78) - 90 Shore
2	Main connection
3	Electrical connector 7 pin DIN 43563 - IP67 PG11 EX7S/L/10 code 3890000003 (to be ordered separately)

## 10 - OVERALL AND MOUNTING DIMENSIONS DXPE7J

dimensions in mm



### NOTES:

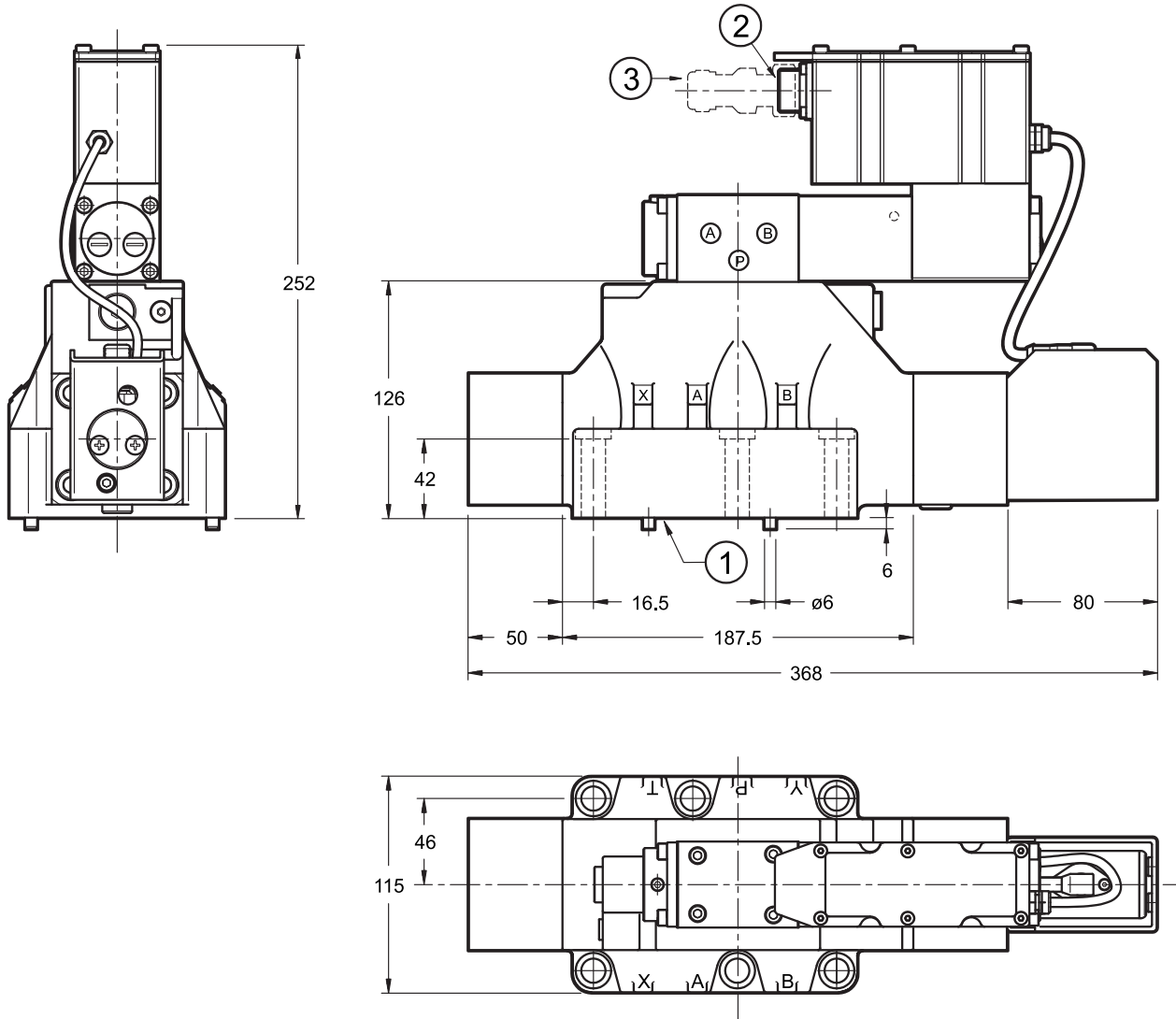
- See mounting surface at paragraph 12.  
- Do not dismantle the transducers.

Valve fastening:	N. 4 bolts M10x60 - ISO 4762 N. 2 bolts M6x60 - ISO 4762
Tightening torque	M10x60: 40 Nm (bolts A 8.8) M6x60: 8 Nm (bolts A 8.8)
Threads of mounting holes:	M6x18; M10x18

1	Mounting surface with sealing rings. 4 OR type 130 (22.22X2.62) - 90 Shore 2 OR type 2043 (10.82x1.78) - 90 Shore
2	Main connection
3	Electrical connector 7 pin DIN 43563 - IP67 PG11 EX7S/L/10 code 3890000003 (to be ordered separately)

## 11 - OVERALL AND MOUNTING DIMENSIONS DXPE8J

dimensions in mm



### NOTES:

See mounting surface at paragraph 12.

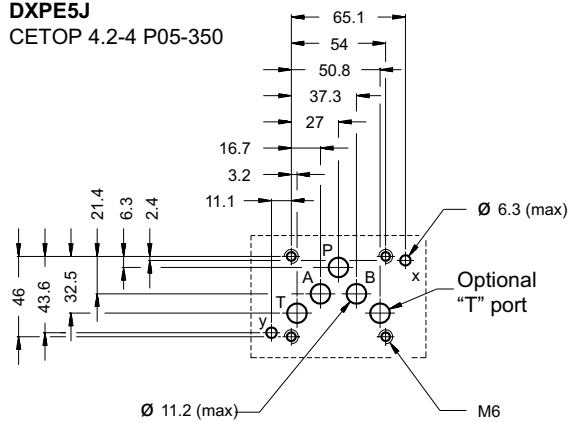
- Do not dismantle the transducers.

Fastening of single valve: N. 6 bolts M12X60 - ISO 4762
Tightening torque: 69 Nm (bolts A 8.8)
Threads of mounting holes: M12X20

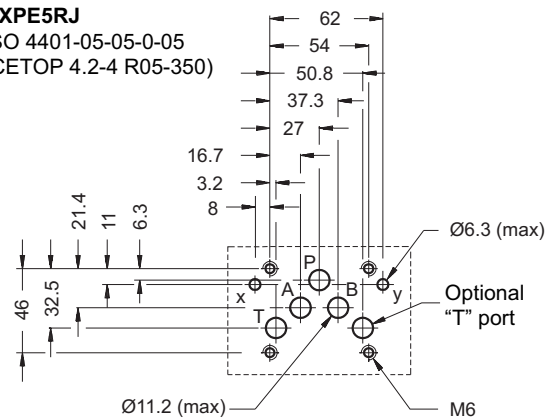
1	Mounting surface with sealing rings: 4 OR type 3118 (29.82x2.62) - 90 Shore 2 OR type 3081 (20.24x2.62) - 90 Shore
2	Main connection
3	Electrical connector 7 pin DIN 43563 - IP67 PG11 EX7S/L/10 code 3890000003 <b>(to be ordered separately)</b>

## 12 - MOUNTING SURFACES

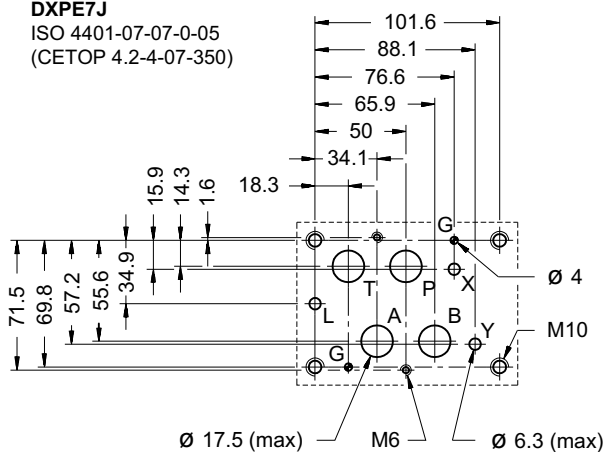
**DXPE5J**  
CETOP 4.2-4 P05-350



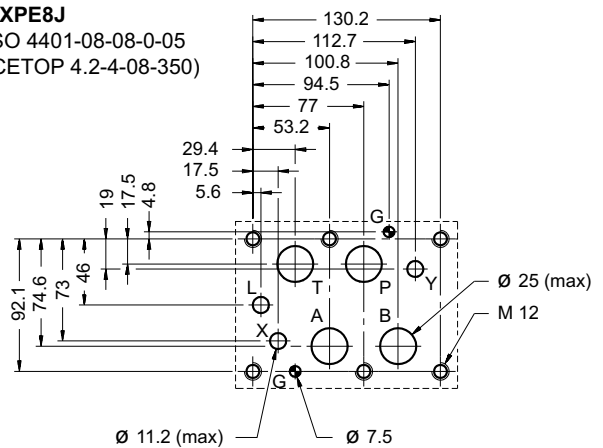
**DXPE5RJ**  
ISO 4401-05-05-0-05  
(CETOP 4.2-4 R05-350)



**DXPE7J**  
ISO 4401-07-07-0-05  
(CETOP 4.2-4-07-350)



**DXPE8J**  
ISO 4401-08-08-0-05  
(CETOP 4.2-4-08-350)



## 13 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

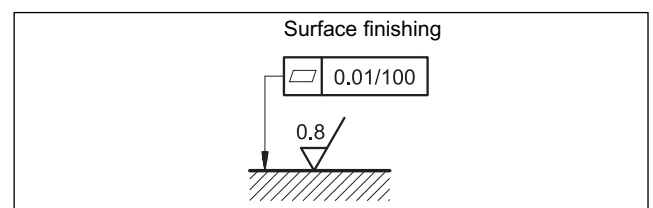
The fluid must be preserved in its physical and chemical characteristics.

## 14 - INSTALLATION

The valves can be installed in any position without impairing correct operation.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.

Take care to the cleanliness of the mounting surfaces and surrounding environment upon installation.





## 15 - ACCESSORIES

(to be ordered separately)

### 15.1 Mating connector

These valves have a plug for 7-pin mating connector, that is placed on the box of the integral motion control.



So as to avoid electromagnetic troubles and comply with the electromagnetic compatibility regulation EMC, it is recommended the use of a metal connector.

If a plastic connector is used, make sure that the protection characteristics IP and EMC of the valve are guaranteed.

Duplomatic can provide a metal cable connector type MIL-C-5015-G (EN 175201-804).

name: **EX7S/L/10** code **3890000003**

### 15.2 - Connection cables size

Power supply:

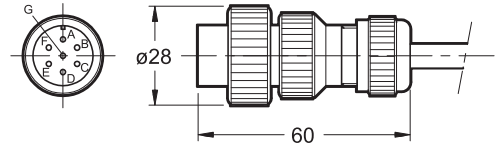
- up to 20 m cable length : 1,0 mm<sup>2</sup>
- up to 40 m cable length : 1,5 mm<sup>2</sup>

Signal: 0,50 mm<sup>2</sup>

A suitable cable would have 7 isolated conductors, a separate screen for the signal wires and an overall screen.

### 15.3 - Kit for start-up LINPC-USB

Device for service start-up and diagnostic, see catalogue 89850.



## 16 - SUBPLATES

(see catalogue 51 000)

	DXPE5J	DXPE7J	DXPE8J
with rear ports	PME4-AI5G	PME07-AI6G	-
with side ports	PME4-AL5G	PME07-AL6G	PME5-AL8G
thread of ports:	P - T - A - B X - Y	3/4" BSP 1/4" BSP	1 1/2" BSP 1/4" BSP