



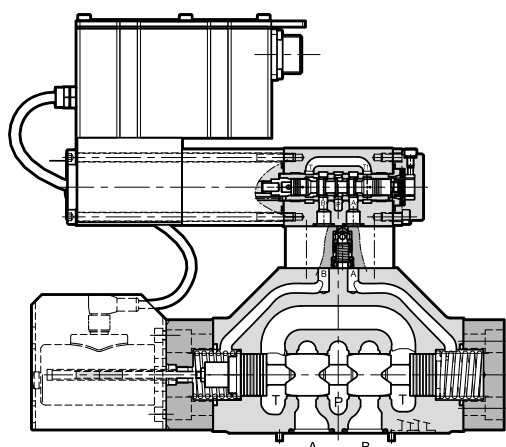
DXRE*J*

DIRECTIONAL CONTROL VALVES OPERATED BY HIGH RESPONSE VALVE, WITH OBE AND FEEDBACK

SUBPLATE MOUNTING

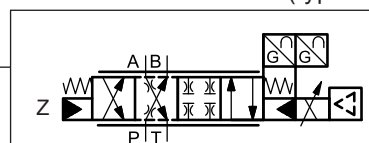
DXRE5RJ*	ISO 4401-05
DXRE7J*	ISO 4401-07
DXRE8J*	ISO 4401-08
DXRE9J*	ISO 4401-08 oversize ports
DXRE10J*	ISO 4401-10
DXRE11J*	ISO 4401-10 oversize ports

OPERATING PRINCIPLE



- DXRE*J* are directional control valves operated by a servo-proportional valve, with mounting surface compliant with ISO 4401 standards. The main spool position is controlled by a linear transducer LVDT in closed loop, which ensures high precision and repeatability.
- The valve is featured by integral electronic based on SMD technology which ensures standard regulations and simplifies the electric wiring. The valve doesn't require any adjustment other than the possible electronic set of the zero point.
- Two types of integrated electronics are available: for analogue signals or for fieldbus.
- These valves are suitable for applications in closed-loop position, speed and pressure control systems. Without power supply or enable input, the main spool is pushed and held in a fail-safe position by the centring springs.

HYDRAULIC SYMBOL (typical)



PERFORMANCES

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

		DXRE5RJ*	DXRE7J*	DXRE8J*	DXRE9J*	DXRE10J*	DXRE11J*
Max operating pressure:							
P - A - B ports	bar		350		300	350	320
T - X - Y ports			250		250	250	250
Controlled flow with Δp 10 bar P-T	l/min	100	220	400	480	800	1000
Hysteresis	% Q _{max}	< 0.2%					
Repeatability	% Q _{max}	± 0.1%					
Electrical characteristics		see point 4					
Ambient temperature range	°C	-20 / +60					
Fluid temperature range	°C	-20 / +80					
Fluid viscosity range	cSt	10 ÷ 400					
Fluid contamination degree		According to ISO 4406:1999 class 18/16/13 (16/14/11 for longer life)					
Recommended viscosity	cSt	25					
Mass	kg	8.2	9.7	16	15.8	42.4	40.3



1 - IDENTIFICATION CODE

1.1 - Standard electronics

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

Nominal size: _____
5R = ISO 4401-05
7 = ISO 4401-07
8 = ISO 4401-08
9 = ISO 4401-08 with oversize ports
10 = ISO 4401-10
11 = ISO 4401-10 with oversize ports

Standard electronics for valves with feedback

Spool type: _____
C = closed centre
A = open centre
Z = zero overlap

Nominal flow rate of the spool (see chart p. 3) _____

FS = Fail safe option. Standard for Z spools. _____

Series No. _____
50 = DXRE5RJ, DXRE7J, DXRE8J, DXRE9J and DXRE10J
40 = DXRE11J

Option:
/ W7 = Zinc-nickel surface treatment
Omit if not required.
(see point 1.2)

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

Main connector:
6 pin + PE

Reference signal:
E0 = voltage ± 10 V
E1 = current 4 ± 20 mA

Drain:
I = internal
E = external

Pilot supply:
I = internal
E = external

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

1.2 - 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).

1.3 - Electronics with fieldbus communication

D	X	R	E	JH	-		/	-	-	K16	/	00
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Proportional directional valve with high-response pilot valve

Nominal size: _____

5R = ISO 4401-05
7 = ISO 4401-07
8 = ISO 4401-08
9 = ISO 4401-08 with oversize ports
10 = ISO 4401-10
11 = ISO 4401-10 with oversize ports

Integrated electronics with fieldbus communication for valves with feedback

Spool type: _____

C = closed centre
A = open centre
Z = zero overlap

Nominal flow rate of the spool _____
 (see chart p. 3)

FS = Fail safe option. Standard for Z spools.

Series No. _____

50 = DXRE5RJH, DXRE7JH, DXRE8JH, DXRE9JH and DXRE10JH
40 = DXRE11JH

Seals: _____

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

Option:
/ W7 = Zinc-nickel surface treatment
 Omit if not required (see point 1.2).

X2, X3 Fieldbus type:
EC = EtherCAT
EN = Ethernet /IP
PN = Profinet

X1 Main connection configuration:
D1 = one command
D0 = full digital version (on request - available for reference signal FD type only)

Main connection 11 pin + PE

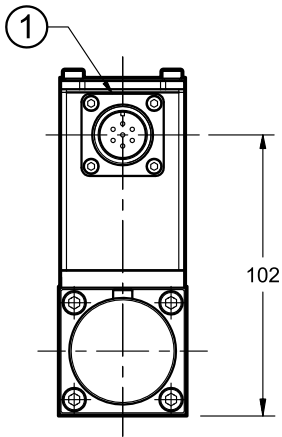
Reference signal:
E0 = voltage ± 10 V
E1 = current $4 \div 20$ mA
FD = full digital version (on request)

Drain:
I = internal
E = external

Pilot supply:
I = internal
E = external

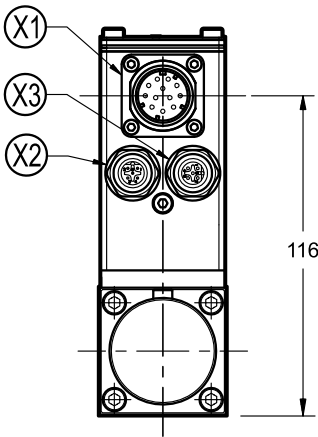
2 - COMPARISON BETWEEN INTEGRATED ELECTRONICS

J type



102

JH type



116

dimensions in mm

NOTE 1: Please refer to sections 5, 6 and 7 for connections descriptions and pinouts.

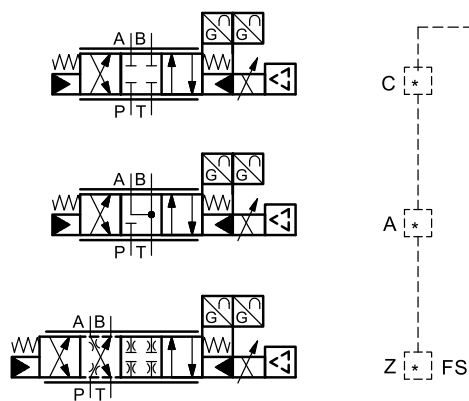
NOTE 2: Related mating connectors have to be ordered separately. See catalogue 89 000.

1	Connection 6 pin + PE
X1	Main connection 11 pin + PE
X2	Fieldbus communication (IN)
X3	Fieldbus communication (OUT)

3 - AVAILABLE CONFIGURATIONS

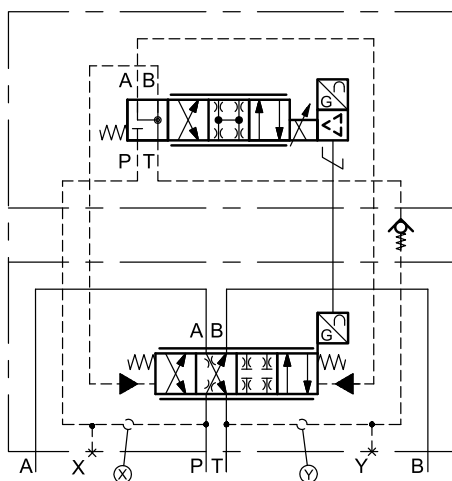
The valve configuration depends on the combination of spool type and rated flow.

3 positions with spring centering



valve type	*	Controlled flow with Δp 10 bar P-T
DXRE5RJ	100	100 l/min
DXRE7J	120	120 l/min
	220	220 l/min
DXRE8J	250	250 l/min
	400	400 l/min
DXRE9J	480	480 l/min
DXRE10J	800	800 l/min
DXRE11J	1000	1000 l/min

detailed symbol (spool Z*FS)

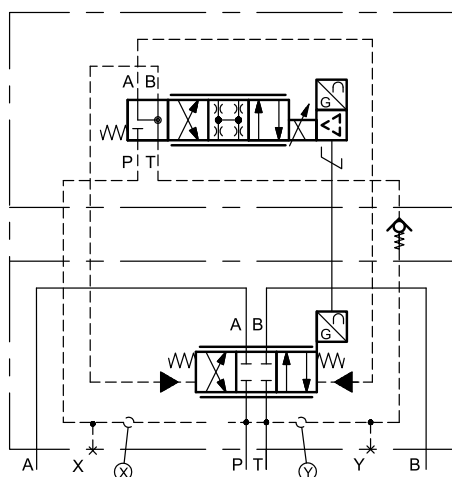


FAIL SAFE POSITION for Z*FS SPOOLS

When a power failure occurs, or when there is no enable input (K11A version), the main spool is moved to the offset position by the springs, with limited opening (1%...6% of the main spool stroke in P-B / A-T direction).

While the electrical supply voltage is being switched off, the actuator may be subject to a brief acceleration in the functional direction P-B / A-T.

detailed symbol (spool C)



4 - ELECTRONICS COMMON DATA

Duty cycle		100% (continuous operation)
Protection class according to EN 60529 (NOTE)		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	A	(fast), max current 4A
Managed breakdowns		Overload and electronics overheating, LVDT sensor error, cable breakdown, supply voltage failures
Electromagnetic compatibility (EMC) emissions EN 61000-6-4, immunity EN 61000-6-2		According to 2014/30/EU standards

NOTE: The IP rating is guaranteed only with mating connector of equivalent IP degree, installed and tightened correctly. Moreover, on the JH versions it is necessary to protect any unused connections with caps.

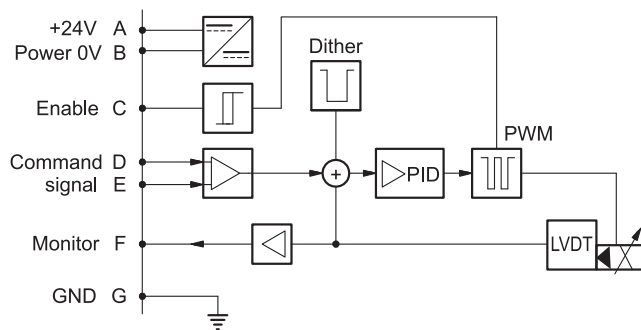
5 - DXRE*J - STANDARD ELECTRONICS

5.1 - Electrical characteristics

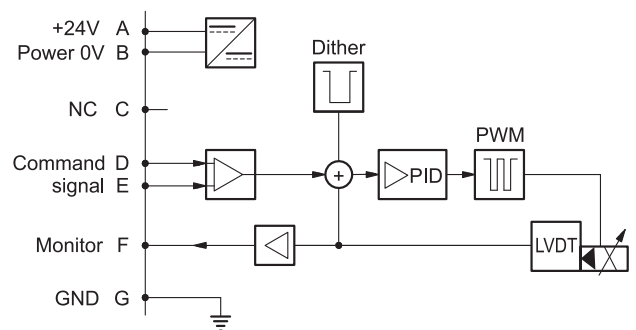
Command signal:	voltage (E0) current (E1)	V DC mA	± 10 (Impedance $R_i > 11 \text{ kohm}$) $4 \div 20$ (Impedance $R_i = 58 \text{ ohm}$)
Monitor signal (main spool position):	voltage (E0) current (E1)	V DC mA	± 10 (Impedance $R_o > 1 \text{ kohm}$) $4 \div 20$ (Impedance $R_o = 500 \text{ ohm}$)
Communication for diagnostic			LIN-bus Interface (by means of the optional kit)
Connection			6 pin + PE (MIL-C-5015-G - DIN EN 175201-804)

5.2 - On-board electronics diagrams

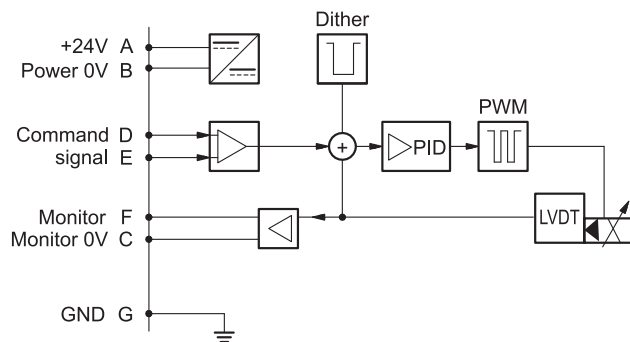
VERSION A - External Enable



VERSION B - Internal Enable

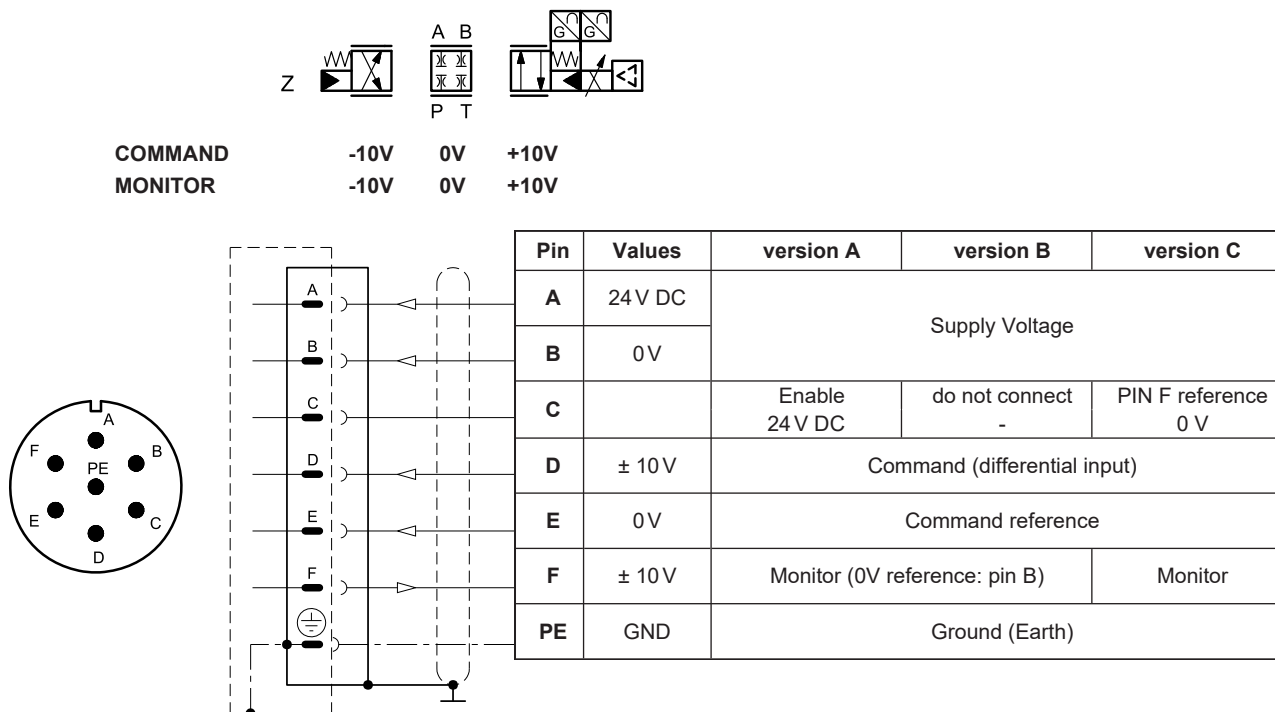


VERSION C - 0V Monitor



5.3 - Version with voltage command (E0)

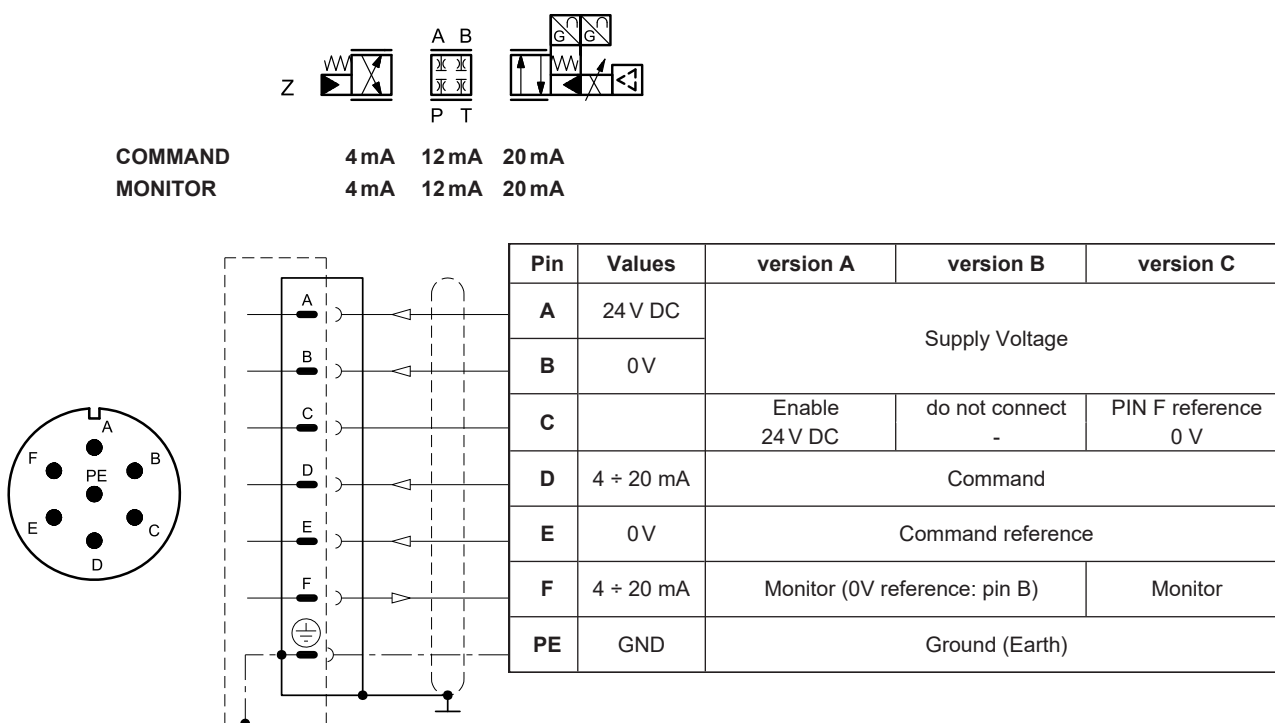
The reference signal must be between -10V and +10V. The monitor feature of versions B and C becomes available with a delay of 0.5 sec from the power-on of the card.



5.4 - Version with current command (E1)

The reference signal is supplied in current $4 \div 20$ mA. If the current for command is lower than 4 mA 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 - DXRE*JH - FIELDBUS ELECTRONICS

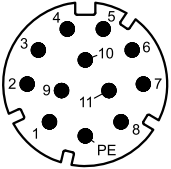
The 11+ PE pin connection allows separate supply voltage for electronics and solenoid.

Command - valve position schemes as for the standard electronics. Please refer to pictures in points 5.3 and 5.4.

6.1 - Electrical characteristics

Command signal:	voltage (E0) current (E1) digital (FD)	V DC mA	± 10 (Impedance $R_i > 11 \text{ kohm}$) $4 \div 20$ (Impedance $R_i = 58 \text{ ohm}$) via fieldbus
Monitor signal (main spool position):	voltage (E0) current (E1)	V DC mA	± 10 (Impedance $R_o > 1 \text{ kohm}$) $4 \div 20$ (Impedance $R_o = 500 \text{ ohm}$)
Communication / diagnostic			via Bus register
Communication interface standards			IEC 61158
Communication physical layer			fast ethernet, insulated 100 Base TX
Power connection			11 pin + PE (DIN 43651)

6.2 - X1 Main connection pin table



D1: one command

Pin	Values	Function
1	24V DC	Main supply voltage
2	0V	
3	24V DC	Enable
4	$\pm 10 \text{ V (E0)}$ $4 \div 20 \text{ (E1)}$	Command
5	0V	Command reference signal
6	$\pm 10 \text{ V (E0)}$ $4 \div 20 \text{ (E1)}$	Monitor (0V reference pin 10)
7	NC	do not connect
8	NC	do not connect
9	24V DC	Logic and control supply
10	0V	
11	24V DC	Fault (0V DC) or normal working (24V DC) (0V reference pin 2)
12	GND	Ground (Earth)

D0: full digital

Pin	Values	Function
1	24V DC	Main supply voltage
2	0V	
3	24V DC	Enable
4	NC	do not connect
5	NC	do not connect
6	NC	do not connect
7	NC	do not connect
8	NC	do not connect
9	24V DC	Logic and control supply
10	0V	
11	24V DC	Fault (0V DC) or normal working (24V DC) (0V ref. pin 2)
12	GND	Ground (Earth)

6.3 - FIELDBUS connections

Please wire following guidelines provided by the related standards communication protocol. Any connections present and not used must be protected with special caps so as not to nullify the protection against atmospheric agents.

X2 (IN) connection M12 D 4 pin female



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

X3 (OUT) connection: M12 D 4 pin female



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

NOTE: Shield connection on connector housing is recommended.

7 - CHARACTERISTIC CURVES

(with mineral oil with viscosity of 36 cSt at 50 °C, DXRE*J-****K11C valves)

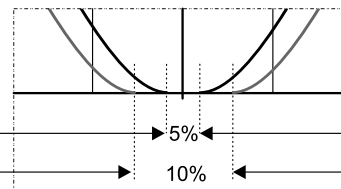
Typical flow rate curves at constant Δp (5 bar per control edge), related to the reference signal.

DXRE*J, spools types C and A:

Valves with spools type C and A are configured to start opening to a given percentage of the reference signal. This percentage differs depending on the versions. It is 5% for DXRE*J...E*K11C and 10% for DXRE*J...E*K11A and DXRE*J...E*K11B.

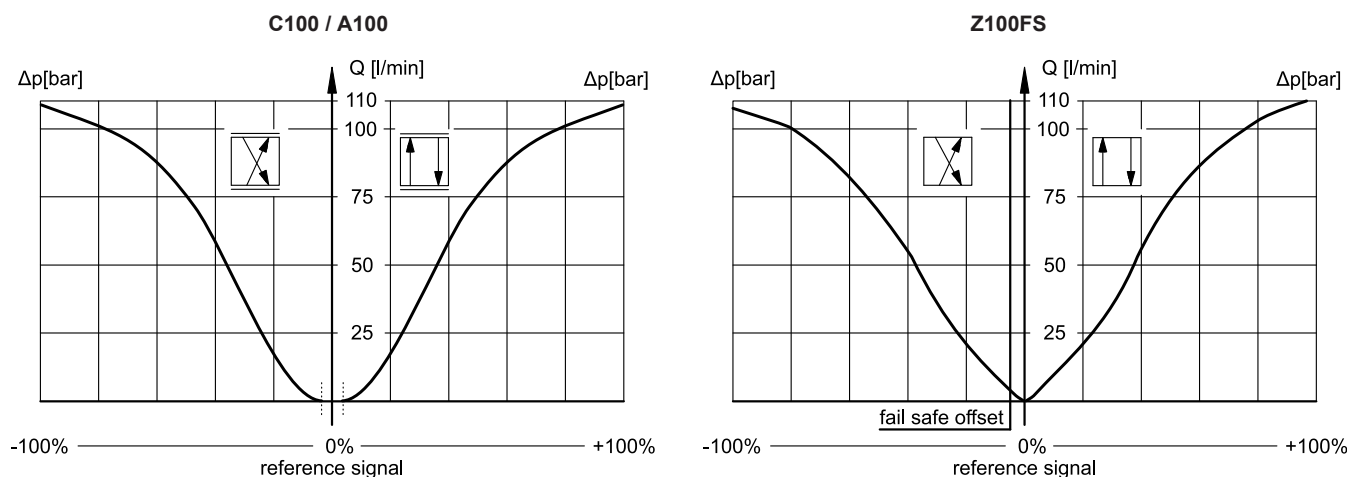
See table below.

valve type		opening values	
		E0 [±10 V]	E1 [4 ÷ 20 mA]
DXRE*J...E*K11C	5% ref.	-0.5...0...+0.5	11.6 ...12...12.4
DXRE*J...E*K11A, ...E*K11B	10% ref.	-1...0...+1	11.2...12...12.8

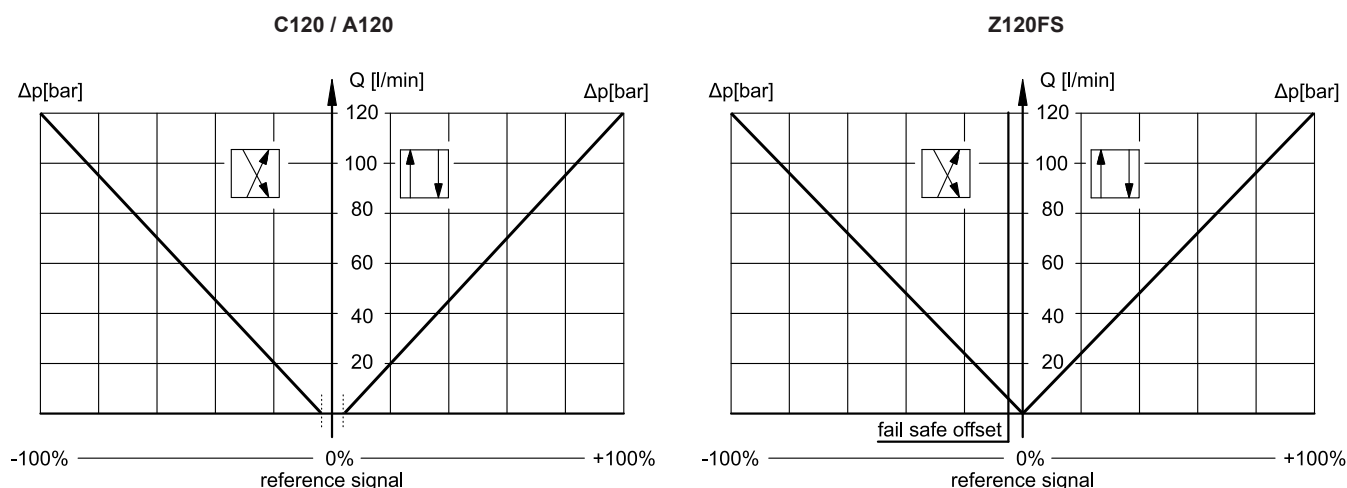


DXRE*JH, spools types C and A: the start opening percentage is 10%.

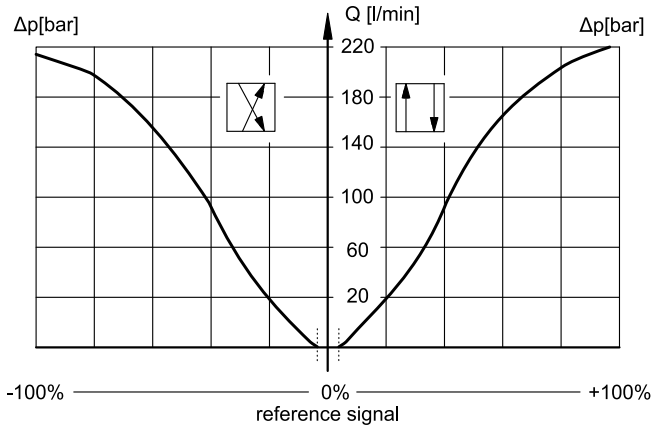
7.1 - DXRE5RJ* Characteristic curves



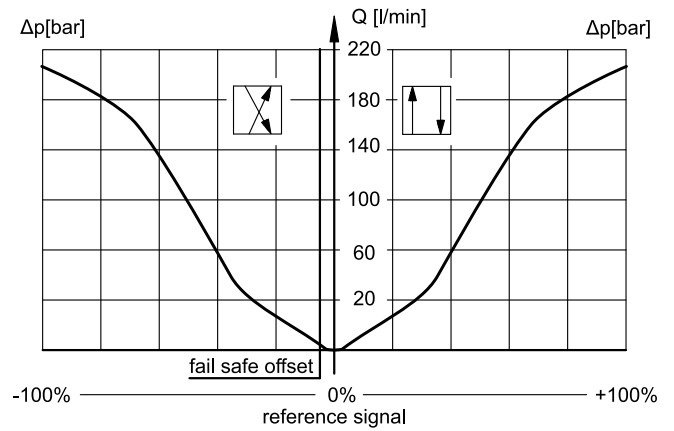
7.2 - DXRE7J* Characteristic curves



C220 / A220

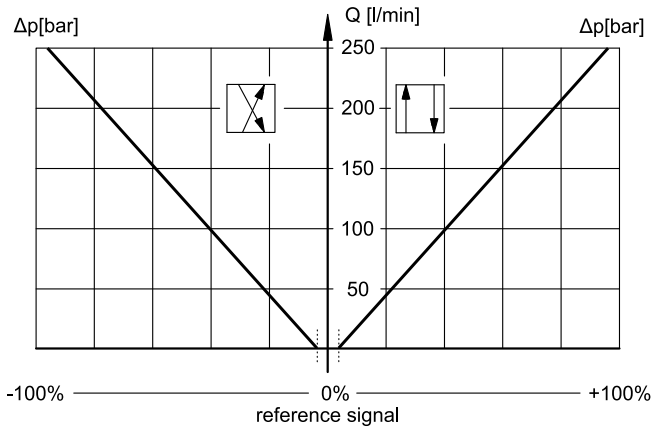


Z220FS

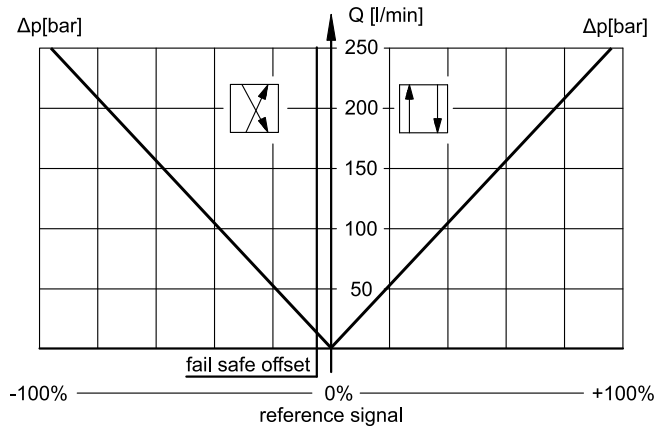


7.3 - DXRE8J* Characteristic curves

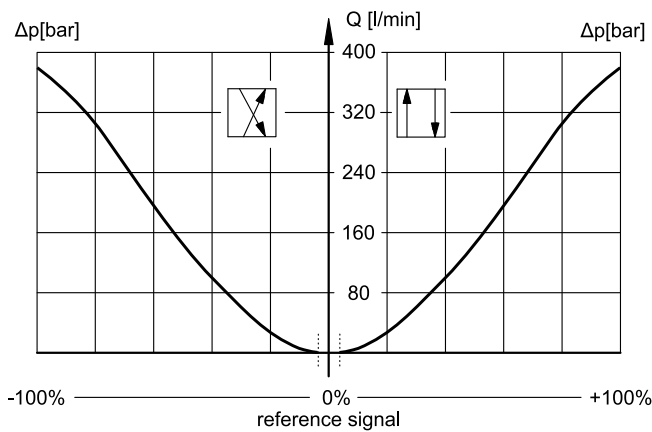
C250 / A250



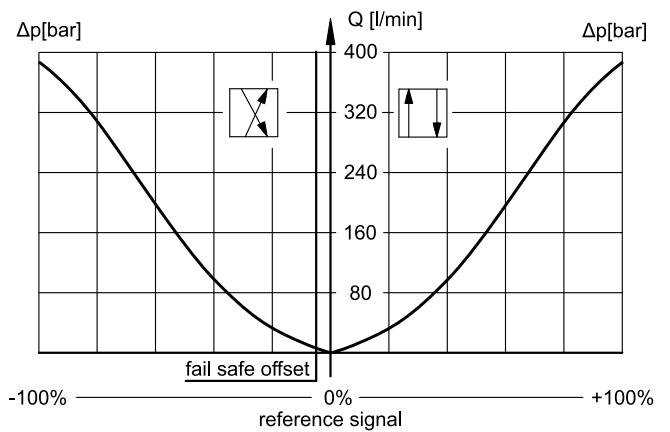
Z250FS



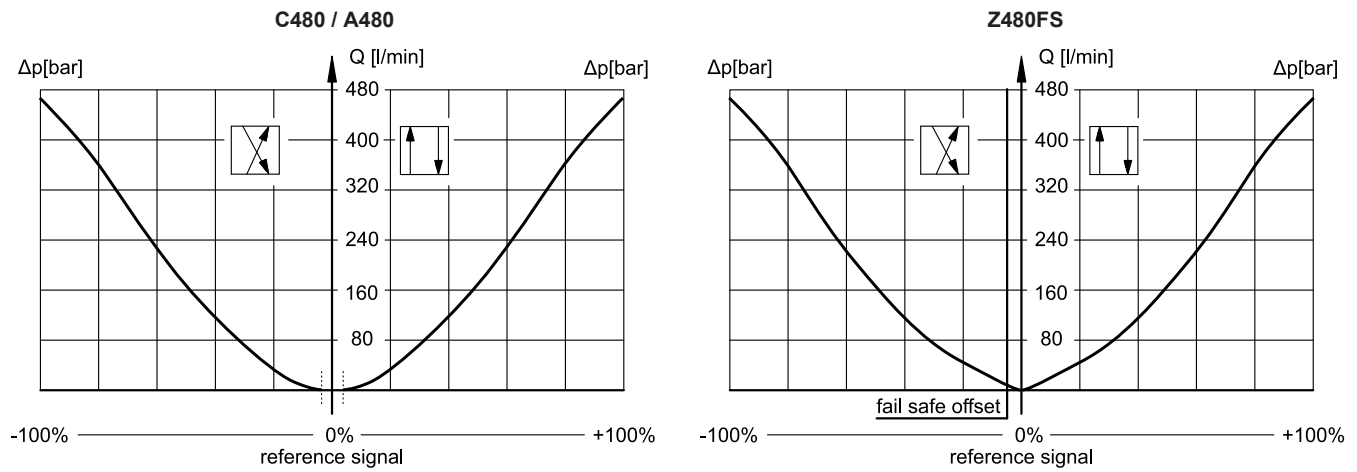
C400 / A400



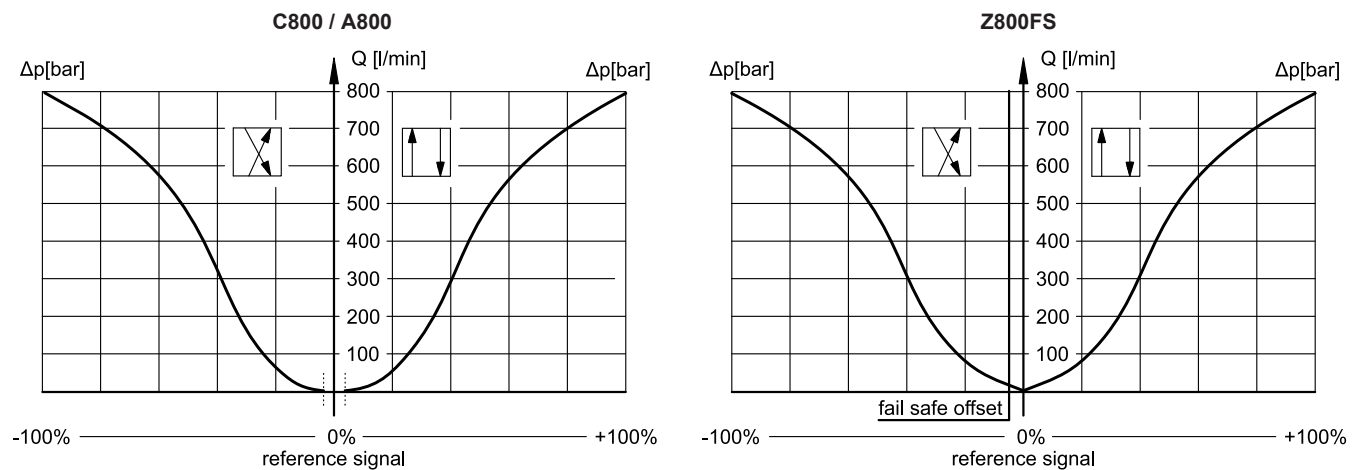
Z400FS



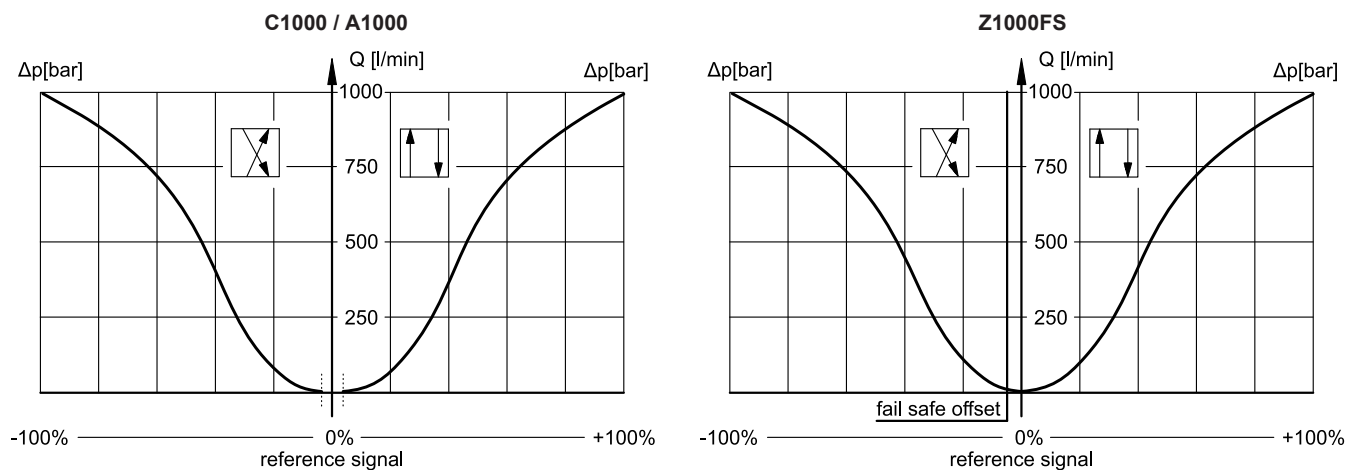
7.4 - DXRE9J* Characteristic curves



7.5 - DXRE10J* Characteristic curves



7.6 - DXRE11J* Characteristic curves



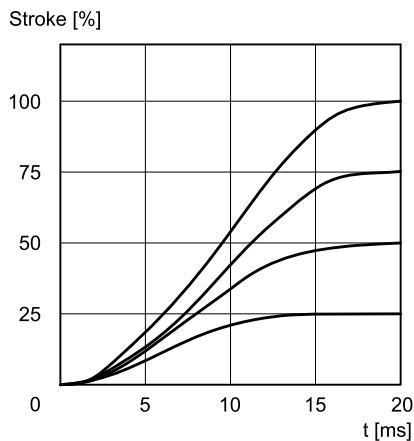
8 - RESPONSE TIMES

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

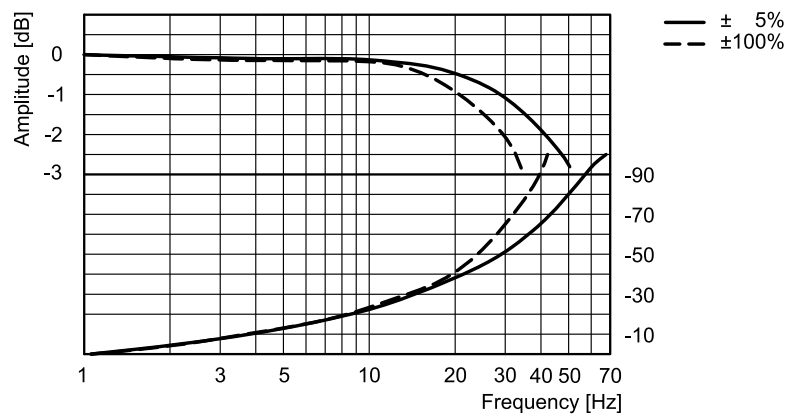
The tables shows the typical step response tested with static pressure 100 bar.

8.1 - DXRE5RJ*

RESPONSE TIME

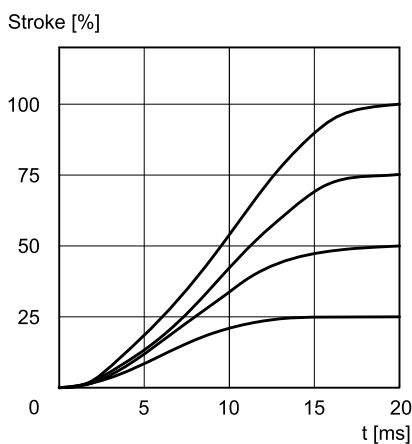


FREQUENCY RESPONSE (spools type Z*FS)

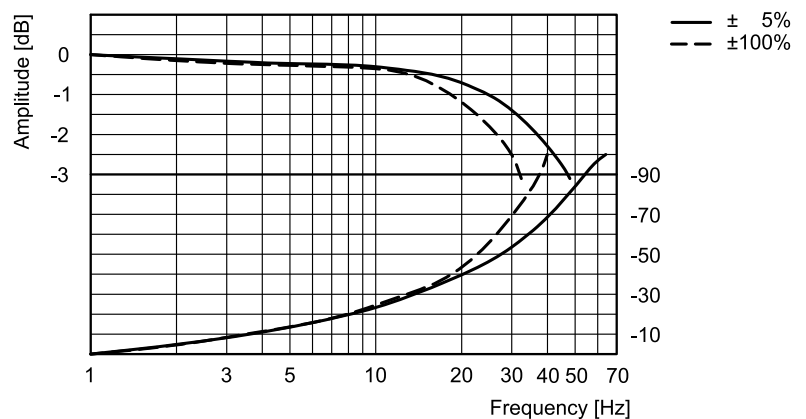


8.2 - DXRE7J*

RESPONSE TIME

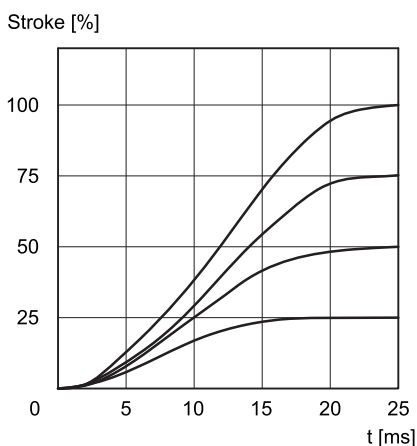


FREQUENCY RESPONSE (spools type Z*FS)

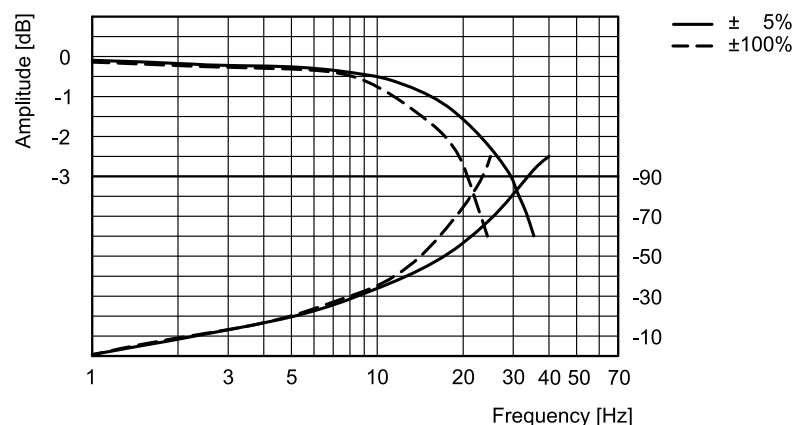


8.3 - DXRE8J* and DXRE9J*

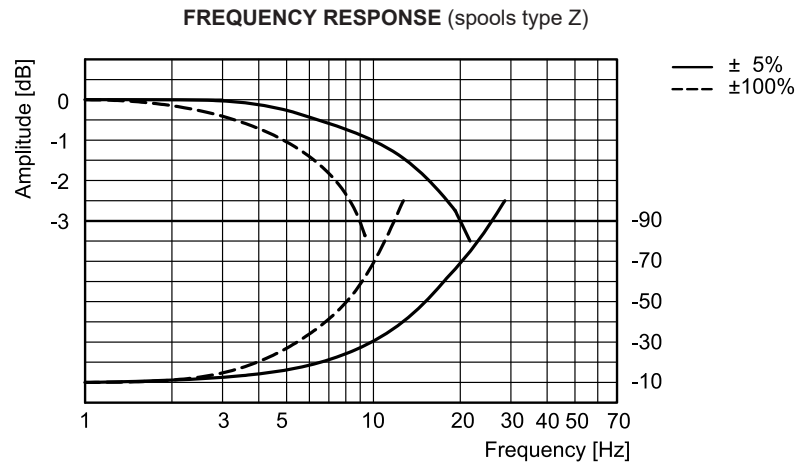
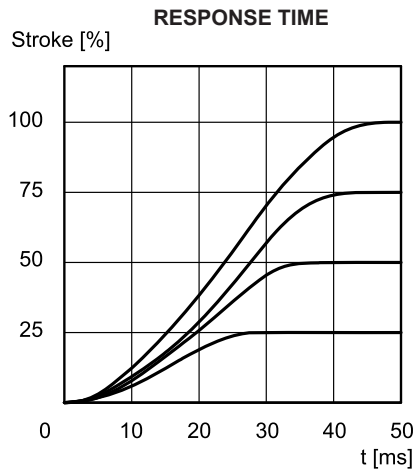
RESPONSE TIME



FREQUENCY RESPONSE (spools type Z*FS)



8.4 - DXRE10J* and DXRE11J*



9 - HYDRAULIC CHARACTERISTICS

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

		DXRE5RJ*	DXRE7J*	DXRE8J*	DXRE9J*	DXRE10J*	DXRE11J*
Max flow rate	l/min	180	450	900	1000	1600	3500
Piloting flow required for operation 0 →100%	l/min	7	13	28	28	35	35
Piloting volume required for operation 0 →100%	cm ³	1.7	3.2	10	10	22	22

PRESSURES (bar)	MIN	MAX
Pilot supply pressure on X port	15	250
Pressure on T port with internal drain	-	30
Pressure on T port with external drain	-	250

9.1 - Pilot and drain

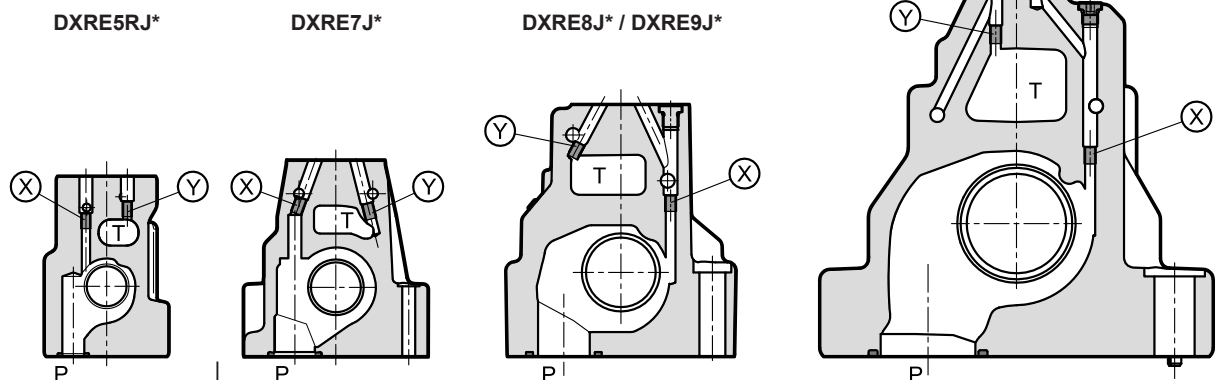
The DXRE*J* valves are available with pilot and drain both internal and external.

The version with external drain allows a higher back pressure on the discharge line.

NOTE: The configuration of pilots and drains must be chosen when ordering. Subsequent modifications are allowed only to specialized operators with authorization and in factory.

TYPE OF VALVE		Plug assembly	
		X	Y
IE	internal pilot and external drain	NO	YES
II	internal pilot and internal drain	NO	NO
EE	external pilot and external drain	YES	YES
EI	external pilot and internal drain	YES	NO

DXRE10J* / DXRE11J*

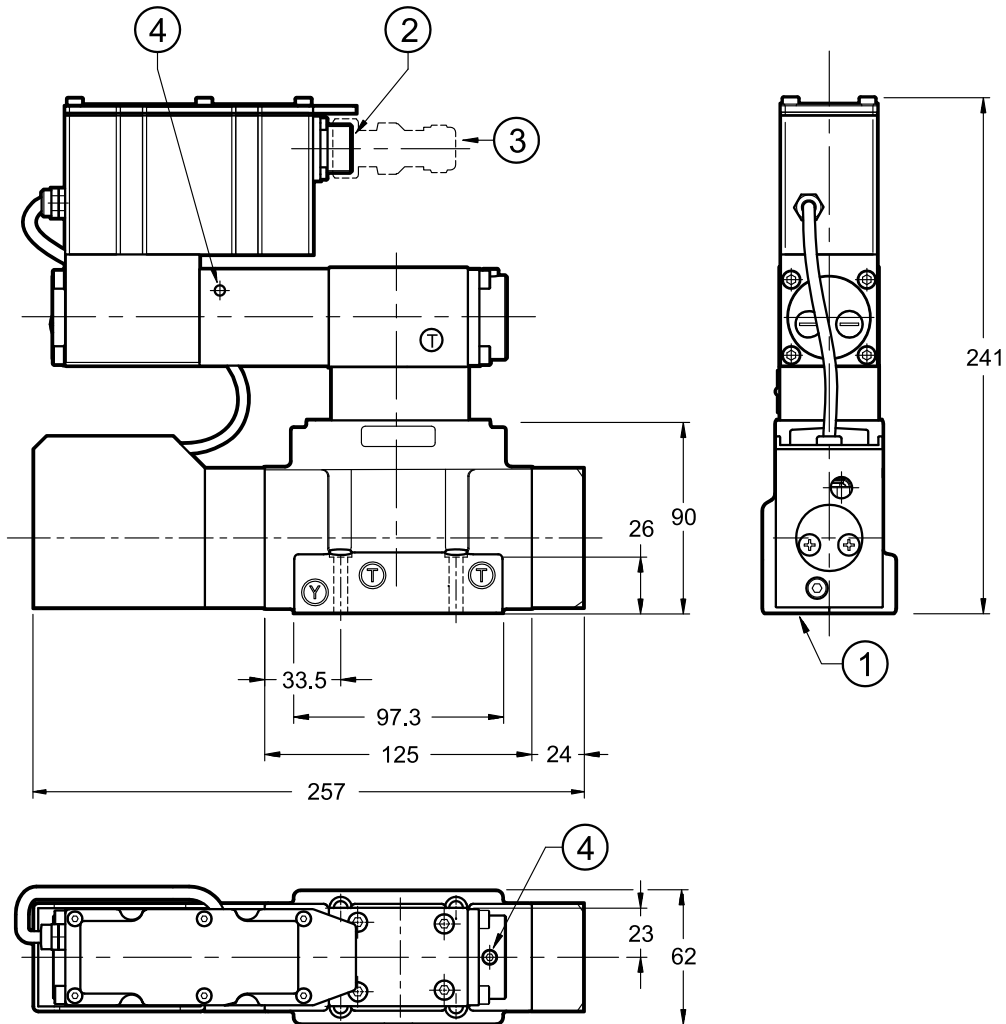


X: plug M5x6 for external pilot
Y: plug M5x6 for external drain

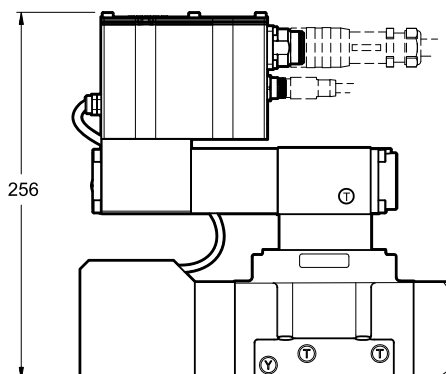
X: plug M6x8 for external pilot
Y: plug M6x8 for external drain

10 - DXRE5RJ* - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



DXRE5RJH



NOTES:

- See point 14 for the mounting surface.
 - Do not dismantle the transducer.
 - The valve is filled with mineral oil during testing. The breathers on the pilot stage must not be opened without specific authorization.
- Breaking the seals may cause the loss of the guarantee.

1	Mounting surface with sealing rings: 5 OR type 2050 (12.42x1.78) - 90 Shore 1 OR type 2037 (9.25x1.78) - 90 Shore
2	Main connection
3	Electrical connector (to be ordered separately). See point 17
4	Air breather. Sealed at the factory (NOTE)

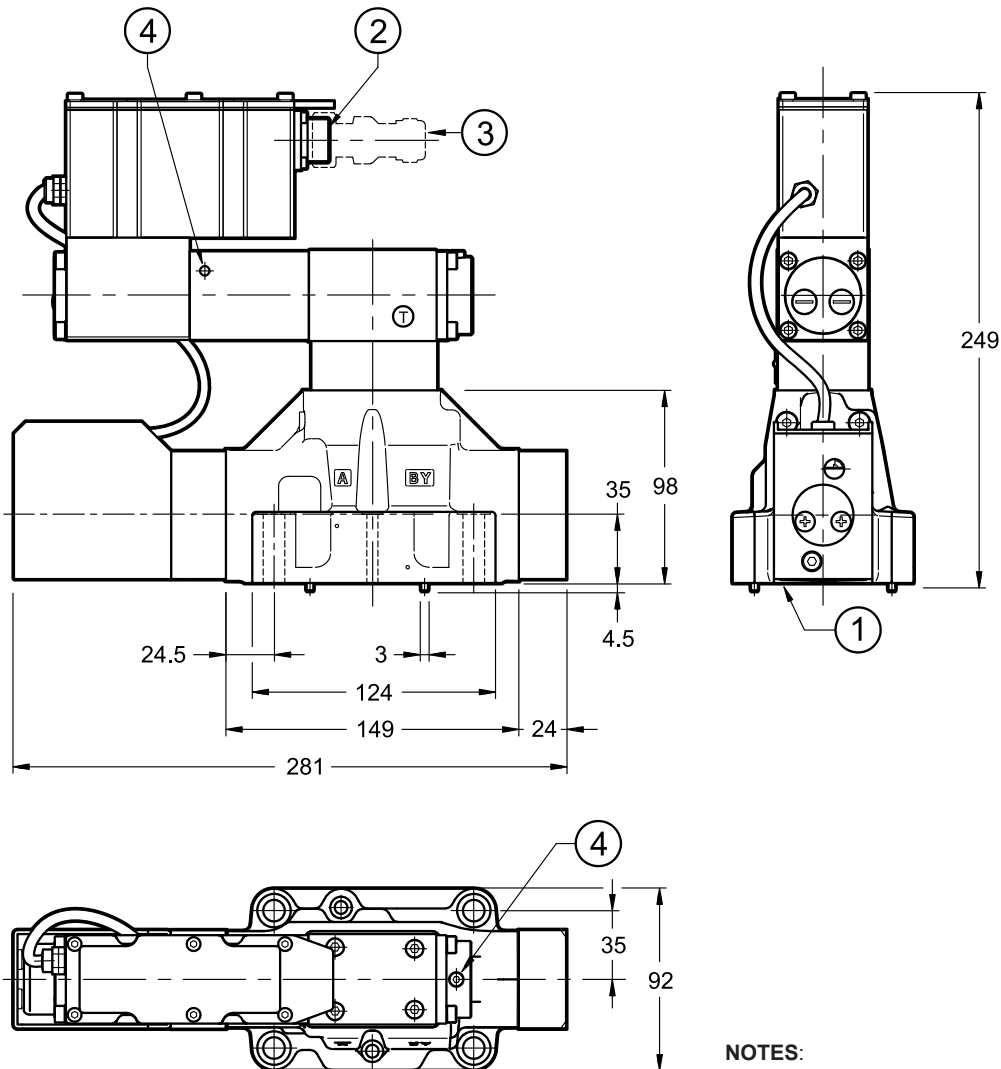
Valve fastening: 4 SHC screws ISO 4762 M6x35

Tightening torque: 8 Nm (A8.8 screws)

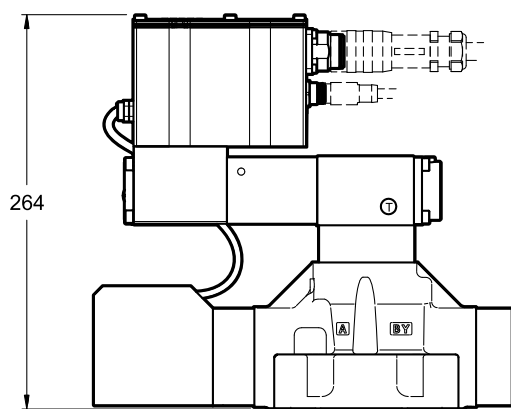
Threads of mounting holes: M6x10

11 - DXRE7J* - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



DXRE7JH



NOTES:

- See point 14 for the mounting surface.
 - Do not dismantle the transducer.
 - The valve is filled with mineral oil during testing. The breathers on the pilot stage must not be opened without specific authorization.
- Breaking the seals may cause the loss of the guarantee.

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 (to be ordered separately) . See point 17
4	Air breather. Sealed at the factory (NOTE)

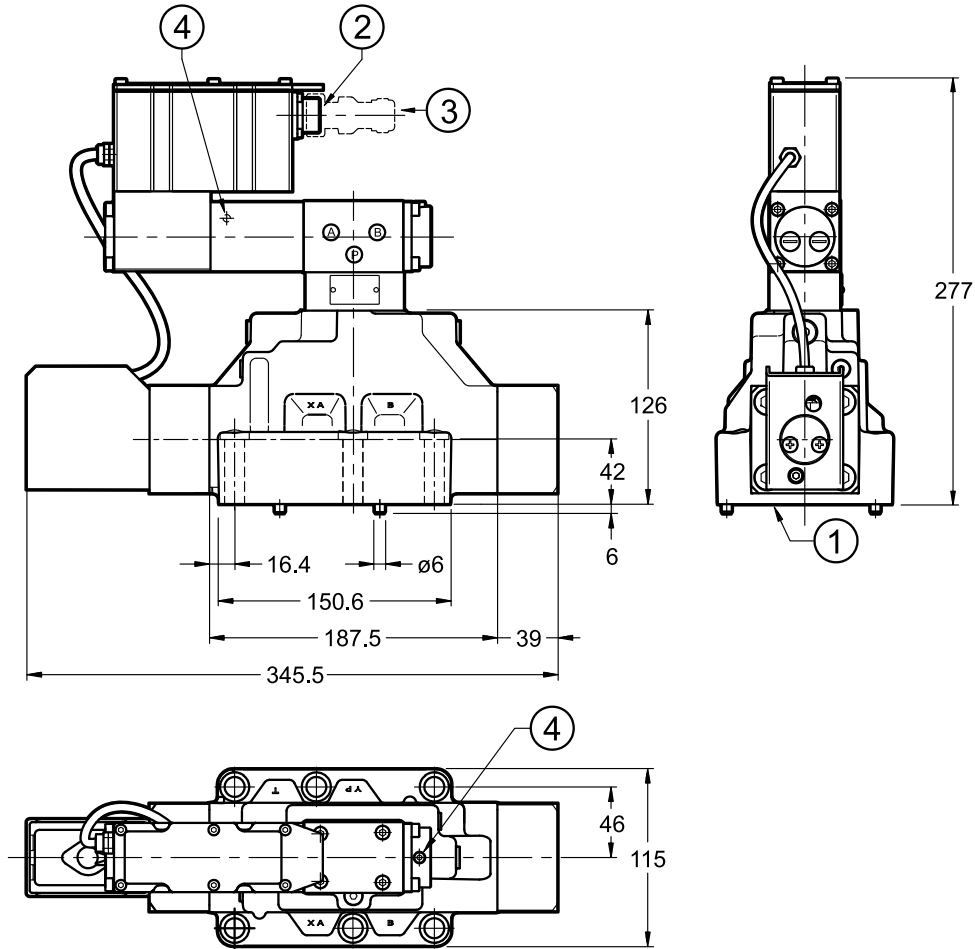
Valve fastening: 4 SHC screws ISO 4762 M10x50
2 SHC screws ISO 4762 M6x50

Tightening torque M10x50: 40 Nm (A8.8 screws)
M6x50: 8 Nm (A8.8 screws)

Threads of mounting holes: M6x18; M10x18

12 - DXRE8J* / DXRE9J* - OVERALL AND MOUNTING DIMENSIONS

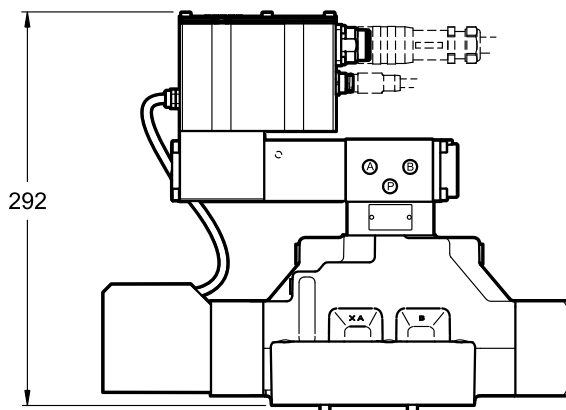
dimensions in mm



NOTES:

- See point 14 for the mounting surface.
 - Do not dismantle the transducer.
 - The valve is filled with mineral oil during testing. The breathers on the pilot stage must not be opened without specific authorization.
- Breaking the seals may cause the loss of the guarantee.

DXRE8JH / DXRE9JH



1	Mounting surface with sealing rings: DXRE8J* 4 OR type 3131 (32.99x2.62) - 90 Shore 2 OR type 3087 (21.89x2.62) - 90 Shore DXRE9J* 4 OR type 3150 (37.77x2.62) - 90 Shore 2 OR type 3087 (20.24x2.62) - 90 Shore
2	Main connection
3	Electrical connector (to be ordered separately). See point 17
4	Air breather. Sealed at the factory (NOTE)

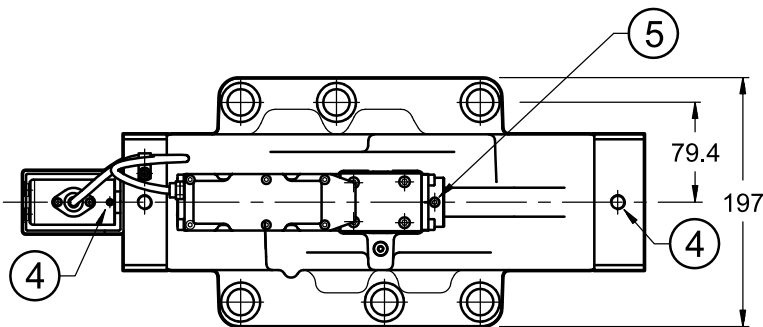
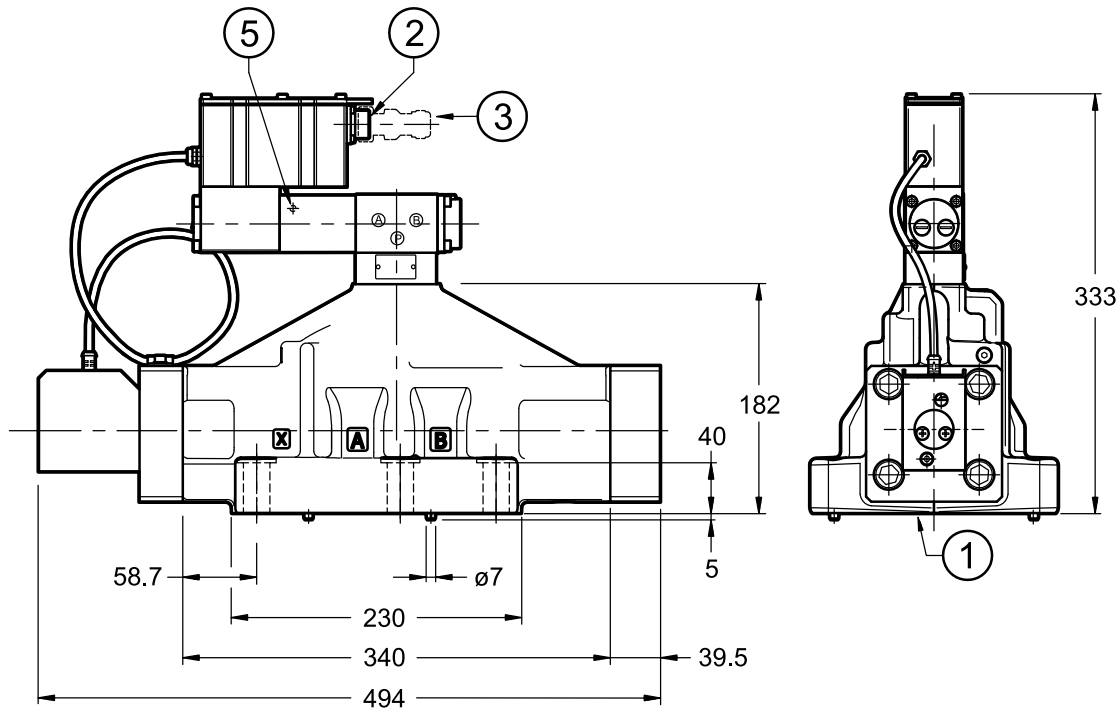
Valve fastening: 6 SHC screws ISO 4762 M12x60

Tightening torque: 69 Nm (A8.8 screws)

Threads of mounting holes: M12x20

13 - DXRE10J* / DXRE11J* - OVERALL AND MOUNTING DIMENSIONS

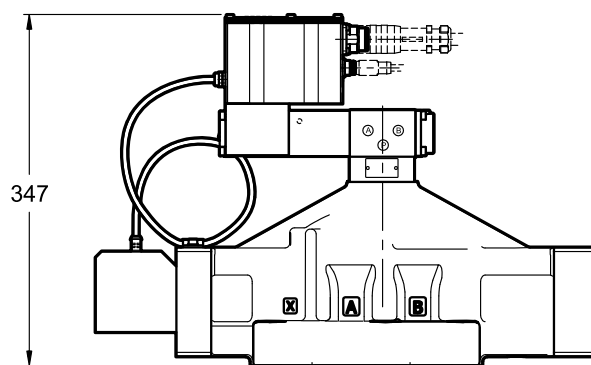
dimensions in mm



NOTES:

- See point 14 for the mounting surface.
 - Do not dismantle the transducer.
 - The valve is filled with mineral oil during testing. The breathers on the pilot stage must not be opened without specific authorization.
- Breaking the seals may cause the loss of the guarantee.

DXRE10JH / DXRE11JH



1	Mounting surface with sealing rings: DXRE10J* 4 OR type 4162 (40.86x3.53) - 90 Shore 2 OR type 3081 (20.24x2.62) - 90 Shore DXRE11J* 4 OR type 4212 (53.57x3.53) - 90 Shore 2 OR type 3081 (20.24x2.62) - 90 Shore
2	Main connection
3	Electrical connector (to be ordered separately) . See point 17
4	Air breather. Sealed at the factory (NOTE)
5	M12 eyebolt seat for safe lift

Valve fastening: 6 SHC screws ISO 4762 M20x70 (supplied)

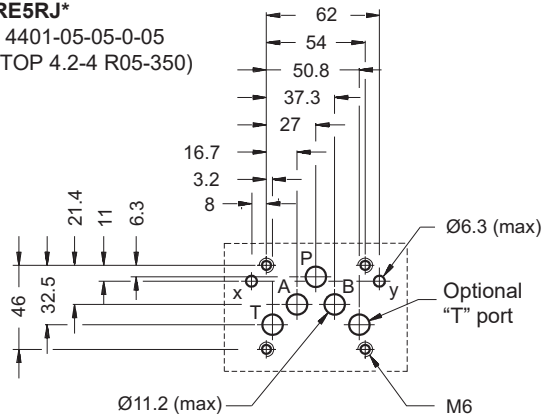
Tightening torque: 470 Nm (A10.9 screws)

Threads of mounting holes: M20x40

14 - MOUNTING SURFACES

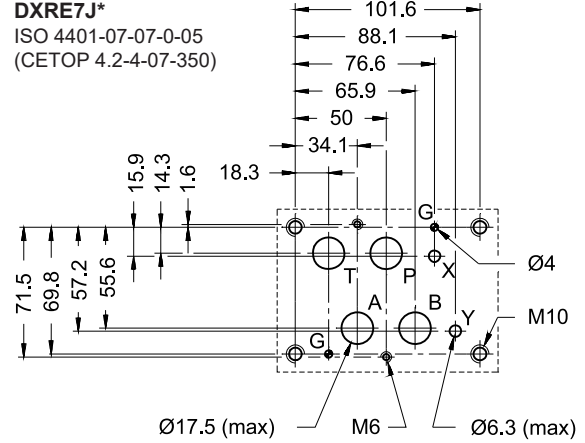
DXRE5RJ*

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



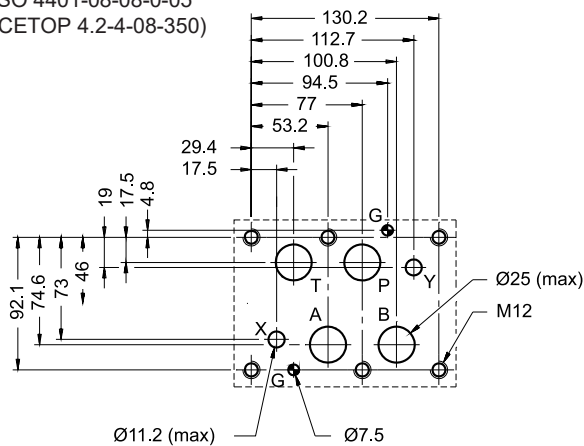
DXRE7J*

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



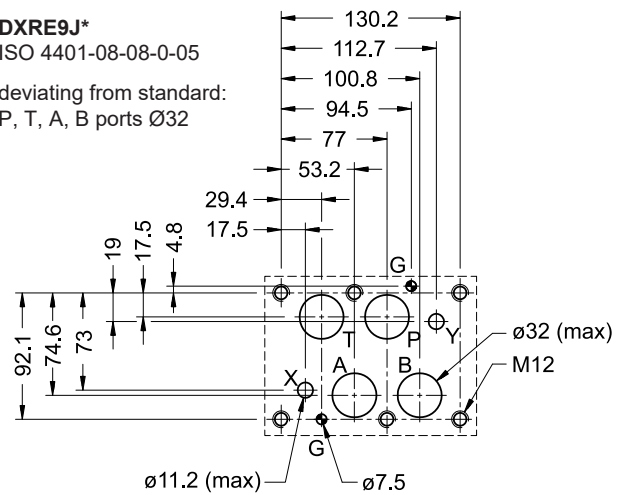
DXRE8J*

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



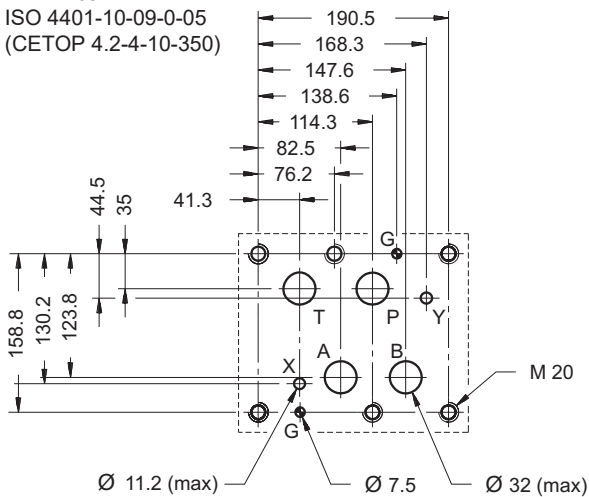
DXRE9J*

ISO 4401-08-08-0-05
deviating from standard:
P, T, A, B ports Ø32



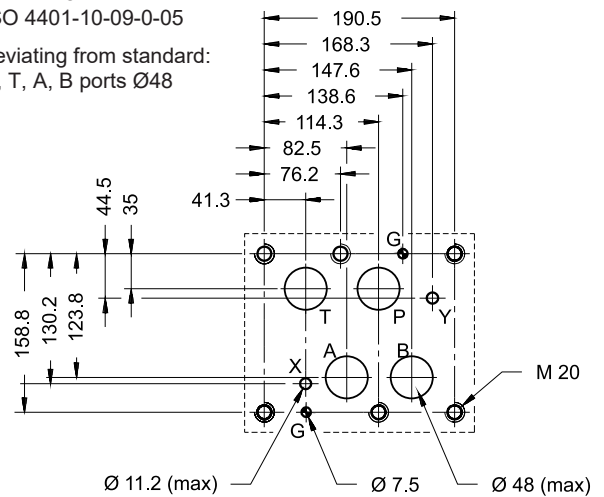
DXRE10J*

ISO 4401-10-09-0-05
(CETOP 4.2-4-10-350)



DXRE11J*

ISO 4401-10-09-0-05
deviating from standard:
P, T, A, B ports Ø48



15 - 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.

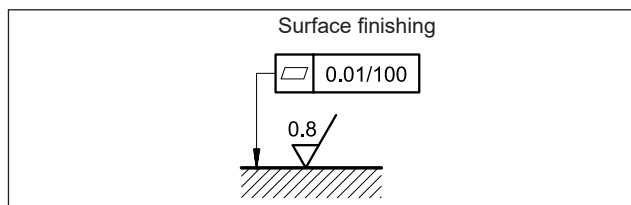
Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

16 - INSTALLATION

The valves can be installed in any position without impairing correct operation. Make sure the hydraulic circuit is free of air.

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.



17 - ACCESSORIES

(to be ordered separately)

17.1 - Mating connectors

Mating connectors must be ordered separately. See catalogue 89 000.



We recommend the choice of a metal connector to avoid electromagnetic disturbances and to comply with EMC regulations on electromagnetic compatibility. If you opt for a plastic connector, make sure that it guarantees and maintains the IP and EMC protection characteristics of the valve.

17.2 - Mating connectors for fieldbus communication.

Duplomatic offers spare parts to be wired and also ready-to-use cord sets. Please refer to cat. 89 000.

17.3 - Connection cable

The optimal wiring provides for 7 isolated conductors, with separate screen for the signal wires (command, monitor) and an overall screen.

Cross section for power supply:

- up to 20 m cable length : 1,0 mm²
- up to 40 m cable length : 1,5 mm²

Cross section for signals (command, monitor):

- 0,50 mm²

17.4 - Kit for start-up LINPC-USB

Device for service start-up and diagnostic. See catalogue 89 850.

18 - SUBPLATES

(see catalogue 51 000)

Subplates are not available for DXRE5RJ, DXRE9J, DXRE10J and DXRE11J.

	DXRE7J*	DXRE8J*
with rear ports	PME07-AI6G	-
with side ports	PME07-AL6G	PME5-AL8G
thread of ports:	1" BSP 1/4" BSP	1 1/2" BSP 1/4" BSP