

DSPE*J

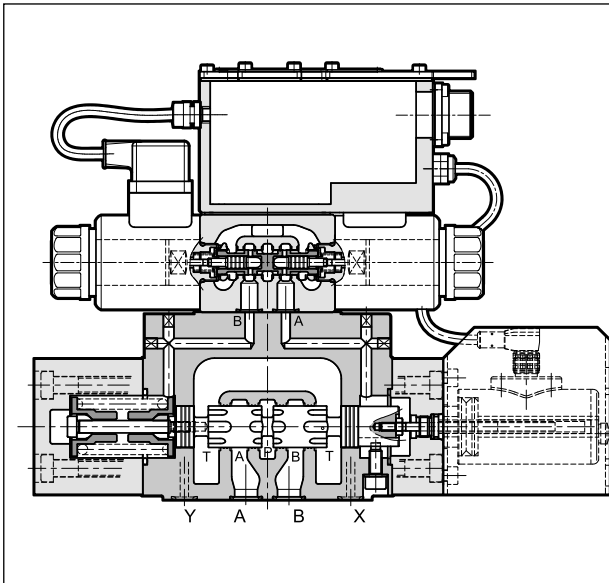
PROPORTIONAL DIRECTIONAL VALVE PILOT OPERATED WITH FEEDBACK AND INTEGRATED ELECTRONICS

SUBPLATE MOUNTING

SERIES 30

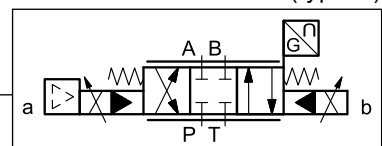
DSPE5J	CETOP P05
DSPE5RJ	ISO 4401-05
DSPE7J	ISO 4401-07
DSPE8J	ISO 4401-08
DSPE10J	ISO 4401-10
DSPE11J	ISO 4401-10 oversize ports

OPERATING PRINCIPLE



- The DSPE*J are pilot operated directional control valves with electric proportional control, feedback and integrated electronics and with mounting interface in compliance with ISO 4401 standards.
- They are controlled directly by an integrated digital amplifier. Transducer and digital card allow a fine control of the positioning of the cursor, reducing hysteresis and response times.
- The valves are available with command signal in voltage or current, and on-board electronics with internal enable, external enable or 0V monitor on pin C.
- A monitoring signal of the main spool position is available.
- The valves are 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. 18)

HYDRAULIC SYMBOL (typical)



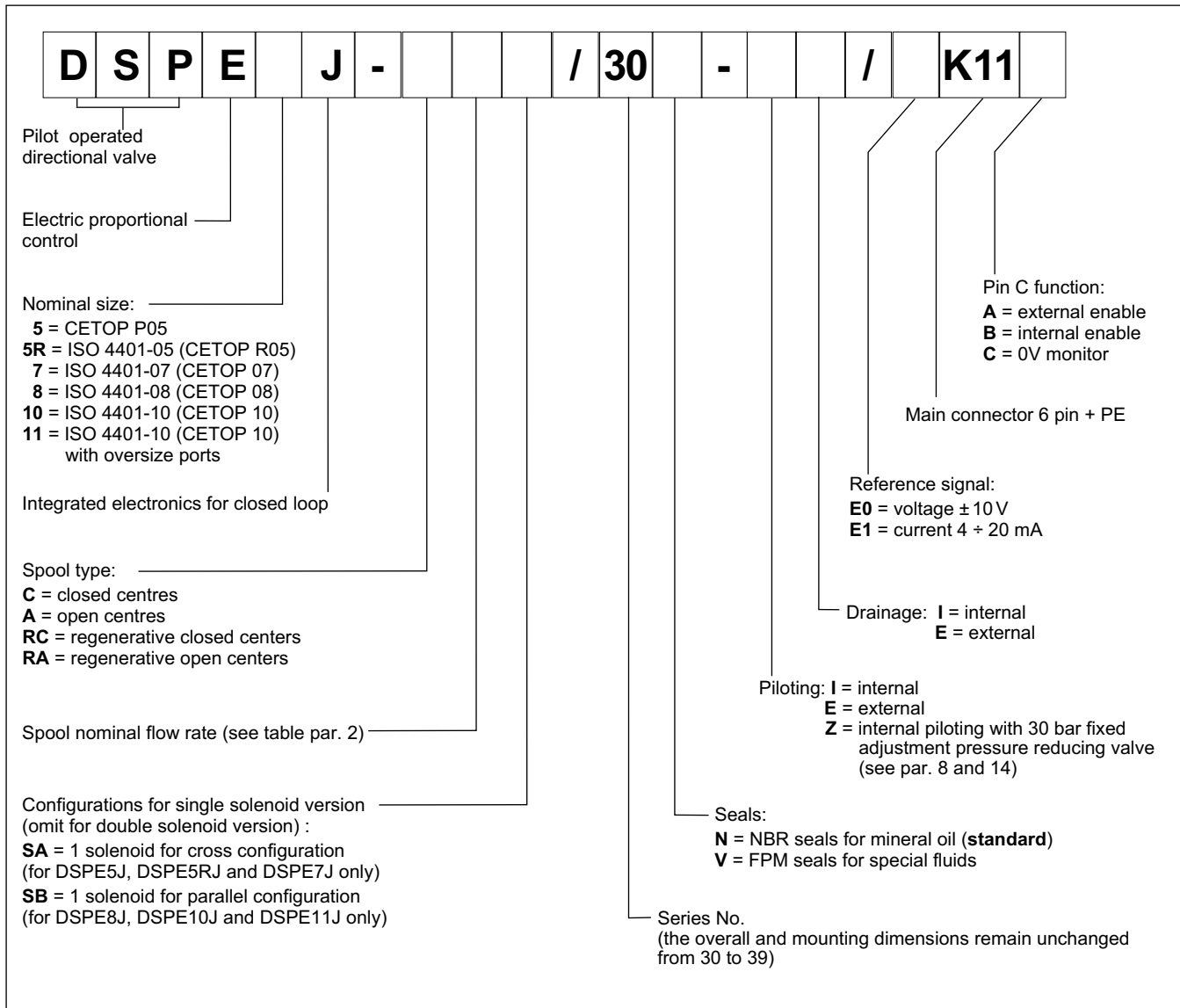
PERFORMANCES

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

		DSPE5J DSPE5RJ	DSPE7J	DSPE8J	DSPE10J	DSPE11J
Max operating pressure: P - A - B ports T port	bar	350 see paragraph 8				
Max flowrate	l/min	180	450	800	1600	2800
Hysteresis	% Q _{max}	< 0,5%				
Repeatability	% Q _{max}	< ± 0,2%				
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 18/16/13				
Recommended viscosity	cSt	25				
Mass: single solenoid valve double solenoid valve	kg	8,5 9	10,5 11	17 17,5	56 56,5	54,5 55



1 - IDENTIFICATION CODE



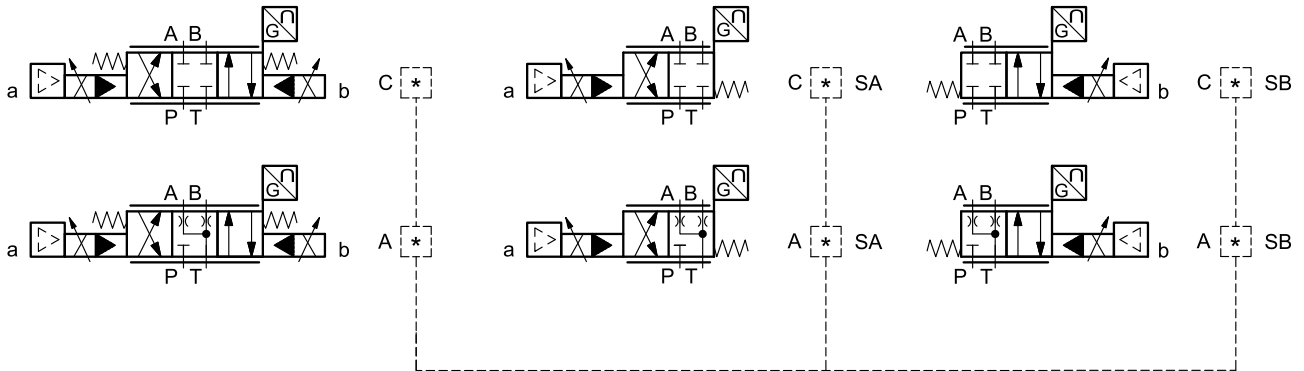
2 - AVAILABLE CONFIGURATIONS

The valve configuration depends on the combination of number of proportional solenoids, spool type, rated flow.

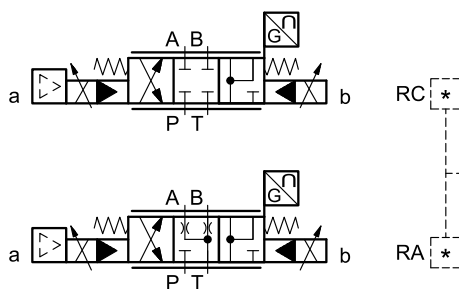
2 solenoids:
3 positions with spring centering

1 solenoid for cross configuration "SA":
2 positions (central + external)
with spring centering
for DSPE5J, DSPE5RJ and DSPE7J
only

1 solenoid for parallel configuration "SB":
2 positions (central + external)
with spring centering
for DSPE8J, DSPE10J and DSPE11J
only



valve type	*	Nominal flow with Δp 10 bar P-T
DSPE5J DSPE5RJ	80	80 l/min
	80 / 40	80 (P-A) / 40 (B-T) l/min
DSPE7J	100	100 l/min
	150	150 l/min
	150 / 75	150 (P-A) / 75 (B-T) l/min
	DSPE8J	200
300		300 l/min
	300 / 150	300 (P-A) / 150 (B-T) l/min
	DSPE10J	350
500		500 l/min
	500 / 250	500 (P-A) / 250 (B-T) l/min
	DSPE11J	800
800 / 500		800 (P-A) / 500 (B-T) l/min



valve type	*	Nominal flow with Δp 10 bar P-T
DSPE7J	150/75	150 (P-A) / 75 (B-T) l/min
DSPE8J	300/150	300 (P-A) / 150 (B-T) l/min
DSPE10J	500/250	500 (P-A) / 250 (B-T) l/min



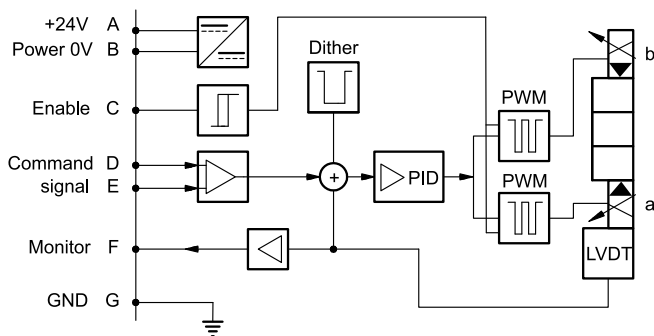
3 - ELECTRICAL CHARACTERISTICS

3.1 - Electrical on board electronics

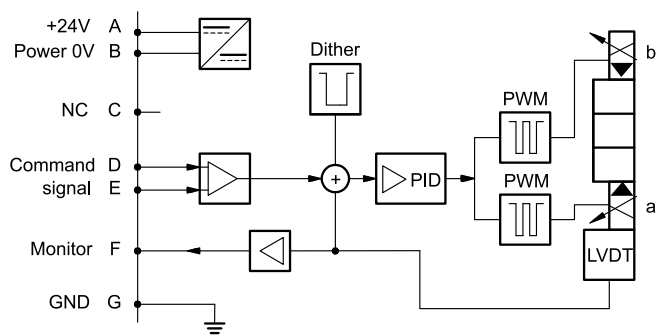
Duty cycle		100% (continuous operation)
Protection class according to EN 60529		IP65 / IP67
Supply voltage	V DC	24 (from 19 to 30 VDC), ripple max 3 Vpp
Power consumption	VA	25
Maximum solenoid current	A	1.88
Fuse protection, external		3A
Command signals: voltage (E0) current (E1)	V DC mA	±10 (Impedance Ri > 11 kOhm) 4 ÷ 20 (Impedance Ri = 58 Ohm)
Monitor signal (spool position): voltage (E0) current (E1)	V DC mA	±10 (Impedance Ro > 1 kOhm) 4 ÷ 20 (Impedance Ro = 500 Ohm)
Managed breakdowns		Overload and electronics overheating, cable breakdown, sensor errors, supply voltage failures
Communication		LIN-bus Interface (with the optional kit)
Connection		7 - pin MIL-C-5015-G (DIN-EN 175201-804)
Electromagnetic compatibility (EMC) emissions EN 61000-6-4 immunity EN 61000-6-2		According to 2004/108/EC standards

3.2 - On-board electronics diagrams

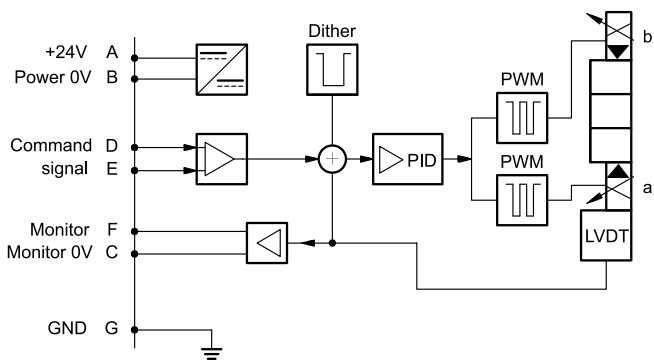
VERSION A - External Enable



VERSION B - Internal Enable

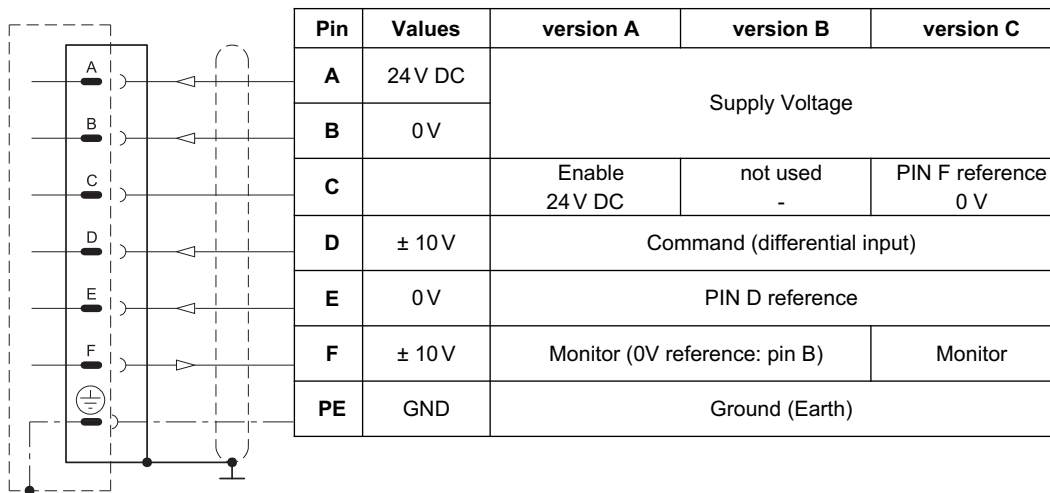
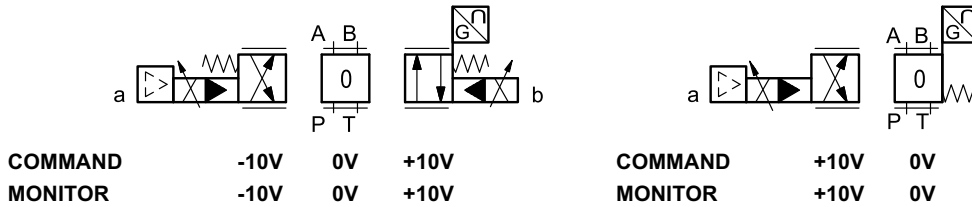


VERSION C - 0V Monitor



4 - VERSIONS WITH VOLTAGE COMMAND (E0)

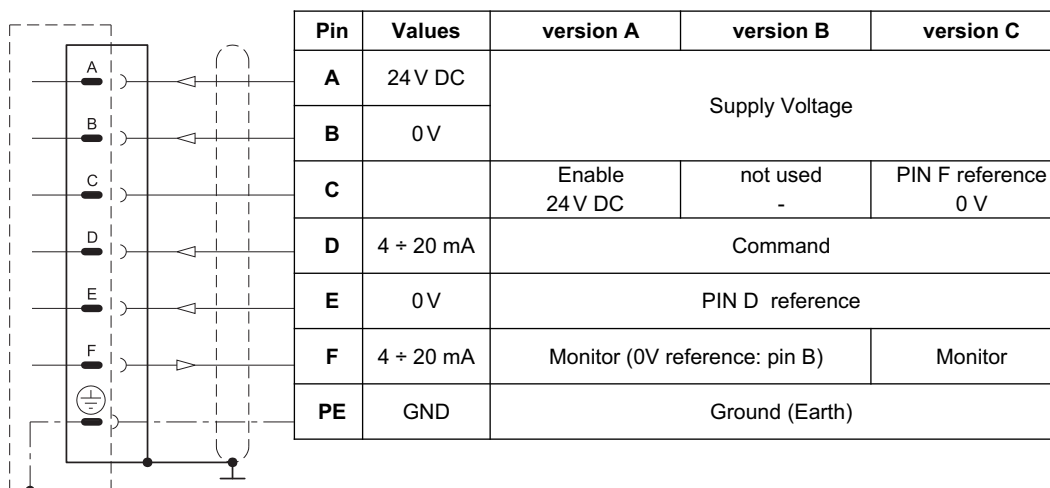
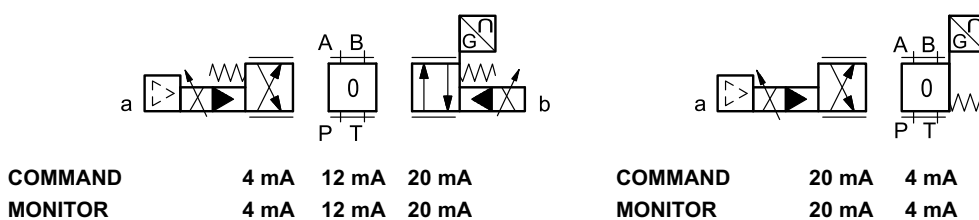
The reference signal is between -10V and +10V on double solenoid valve, and 0...10V on single solenoid valves. The monitor feature of versions B and C becomes available with a delay of 0,5 sec from the power-on of the card.



5 - VERSIONS WITH CURRENT COMMAND (E1)

The reference signal is supplied in current 4 ± 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.

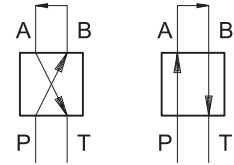




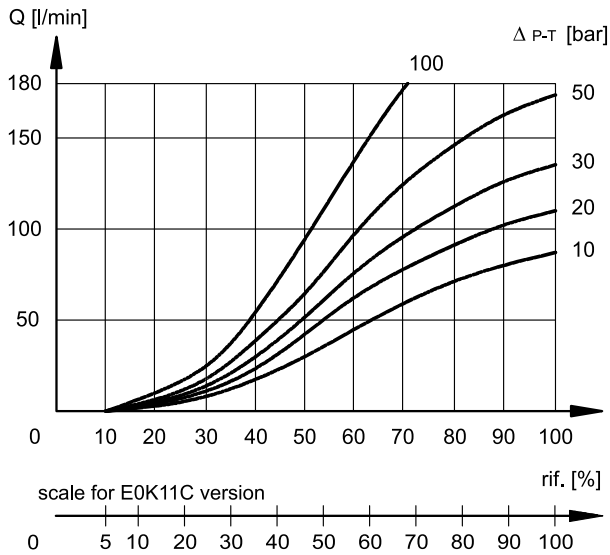
6 - CHARACTERISTIC CURVES

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

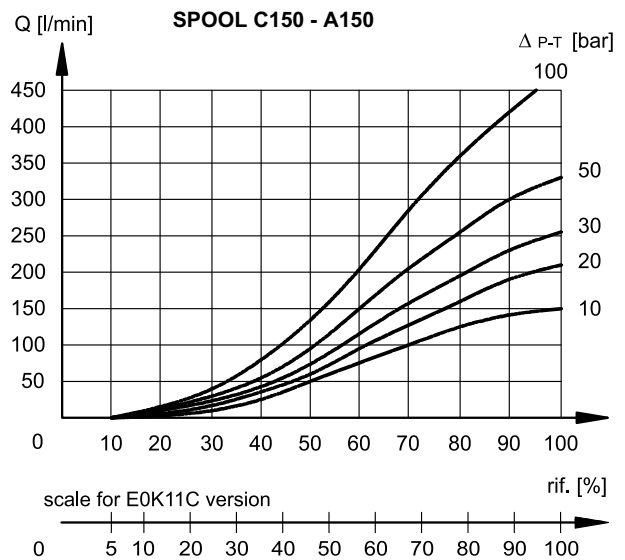
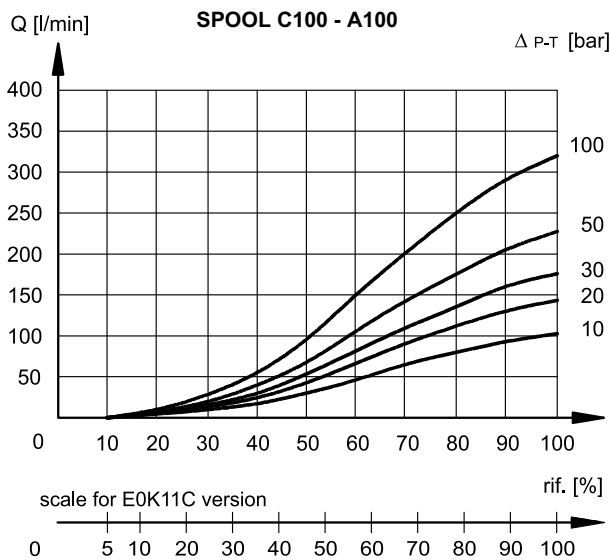
Typical flow rate curves at constant Δp related to the reference signal and measured for the available spools. The Δp values are measured between P and T valve ports.



6.1 - Characteristic curves DSPE5J and DSPE5RJ

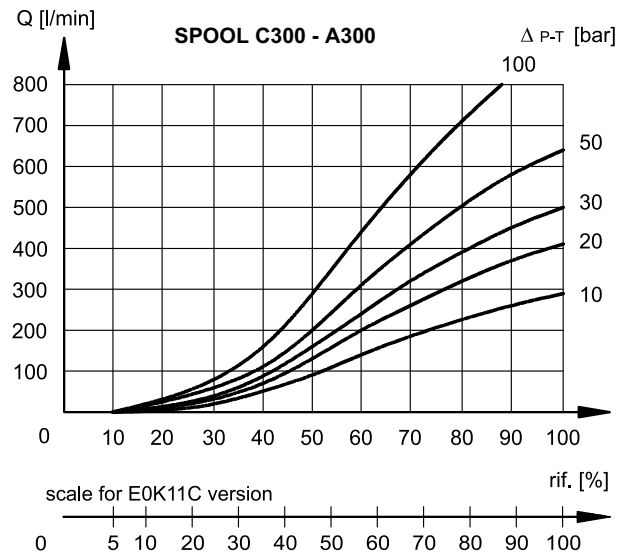
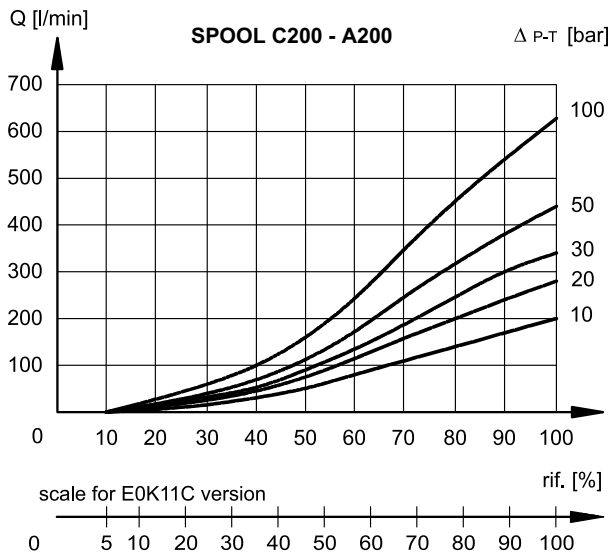


6.2 - Characteristic curves DSPE7J

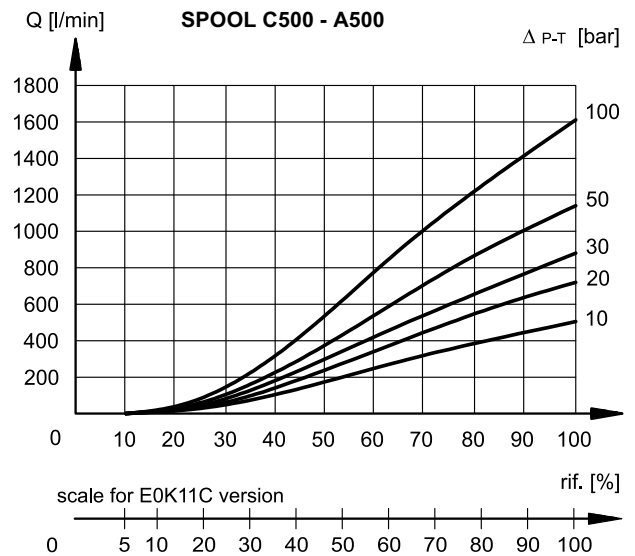
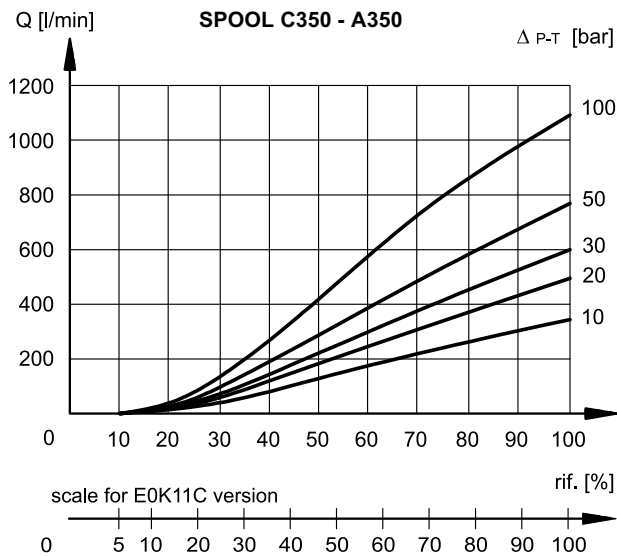




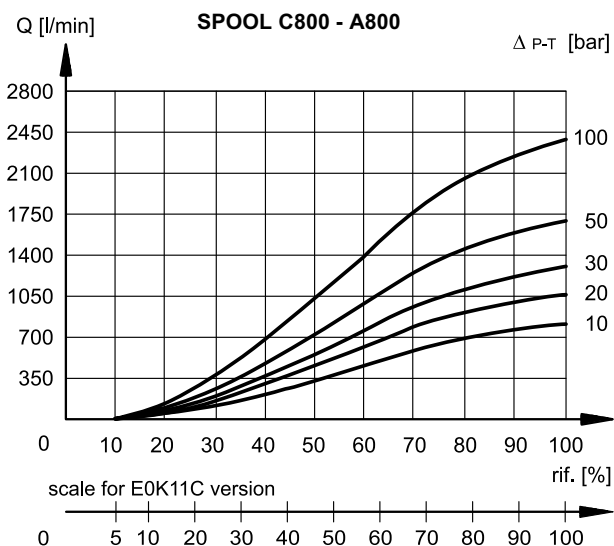
6.3 - Characteristic curves DSPE8J



6.4 - Characteristic curves DSPE10J



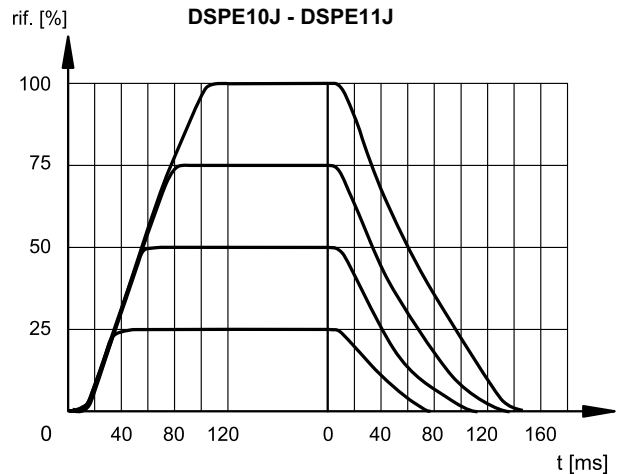
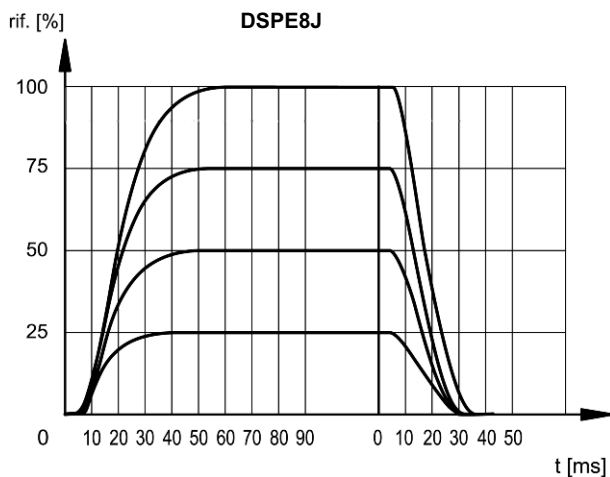
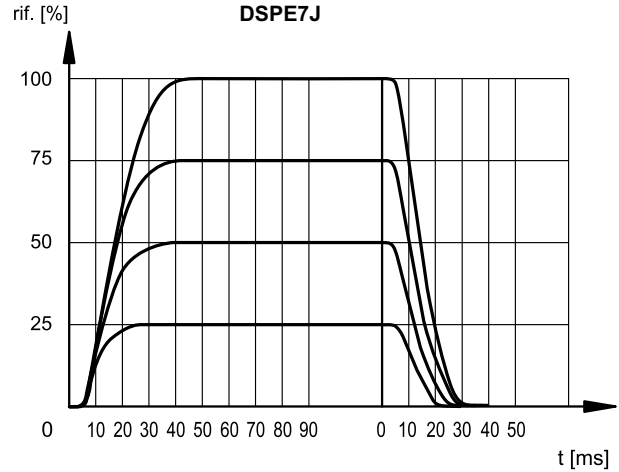
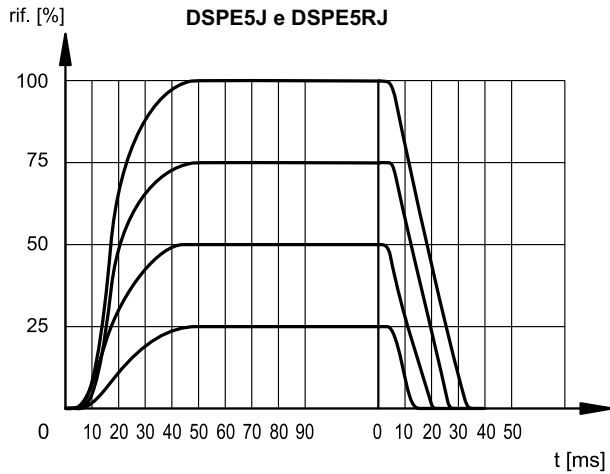
6.5 - Characteristic curves DSPE11J





7 - STEP RESPONSE

(obtained with mineral oil with viscosity of 36 cSt at 50°C and static pressure 100 bar)



8 - HYDRAULIC CHARACTERISTICS

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

FLOWRATES		DSPE5J DSPE5RJ	DSPE7J	DSPE8J	DSPE10J	DSPE11J
Max flow rate	l/min	180	450	800	1600	2800
Piloting flow requested with operation 0 → 100%	l/min	3,5	6,4	15,3	13,7	13,7
Piloting volume requested with operation 0 → 100%	cm ³	1,7	3,2	9,2	21,6	21,6

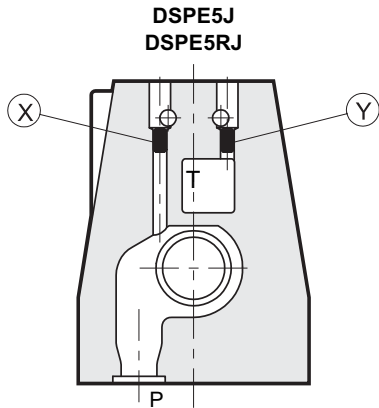
PRESSURES (bar)	MIN	MAX
Piloting pressure on X port	30	210 (NOTE)
Pressure on T port with internal drain	–	10
Pressure on T port with external drain	–	250

NOTE: if the valve operates with higher pressures it is necessary to use the version with external pilot and reduced pressure.

Otherwise, the valve with internal pilot and pressure reducing valve with 30 bar fixed adjustment can be ordered (piloting type: Z, see section 1).

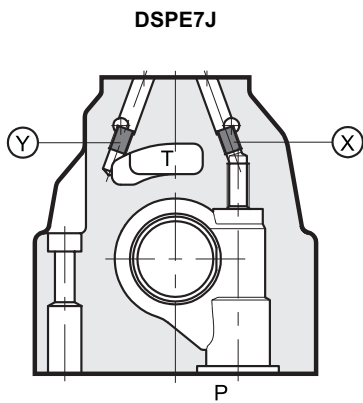
9 - PILOTING AND DRAINAGE

DSPE*J valves are available with piloting and drainage, both internal and external. The version with external drainage allows for a higher back pressure on the outlet.

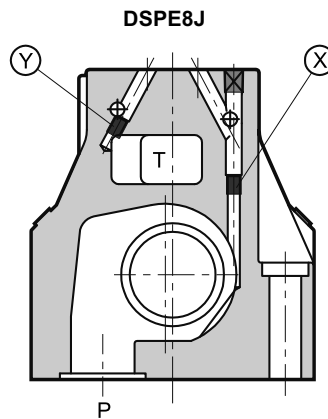


X: plug M5x6 for external pilot
Y: plug M5x6 for external drain

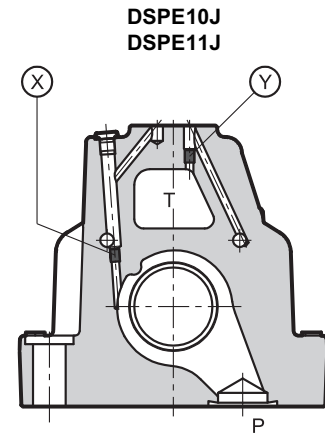
TYPE OF VALVE		Plug assembly	
		X	Y
IE	INTERNAL PILOT AND EXTERNAL DRAIN	NO	YES
II	INTERNAL PILOT AND INTERNAL DRAIN	NO	NO
EE	EXTERNAL PILOT AND EXTERNAL DRAIN	YES	YES
EI	EXTERNAL PILOT AND INTERNAL DRAIN	YES	NO



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

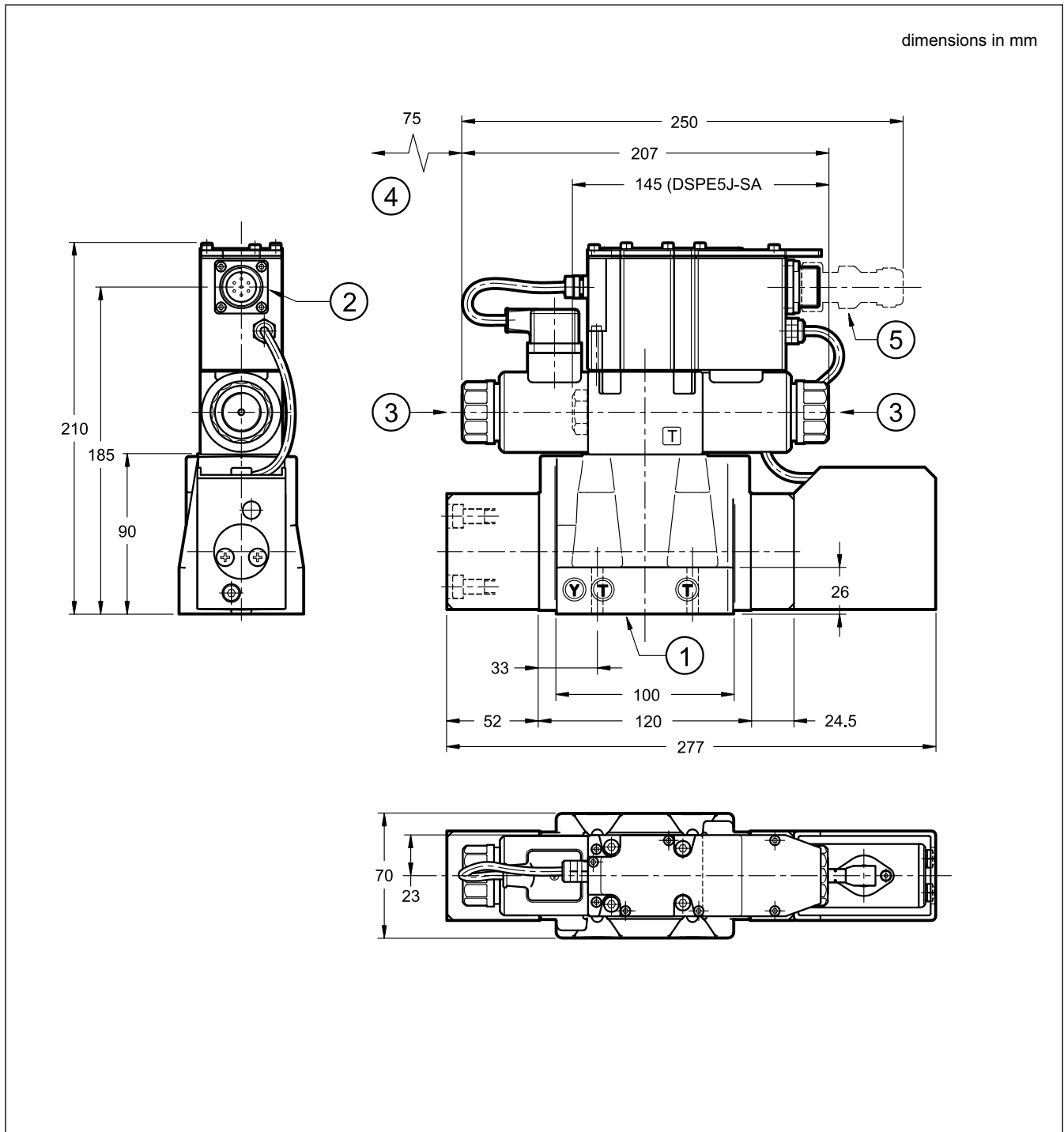


X: plug M6x8 for external pilot
Y: plug M6x8 for external drain



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

10 - OVERALL AND MOUNTING DIMENSIONS DSPE5J AND DSPE5RJ



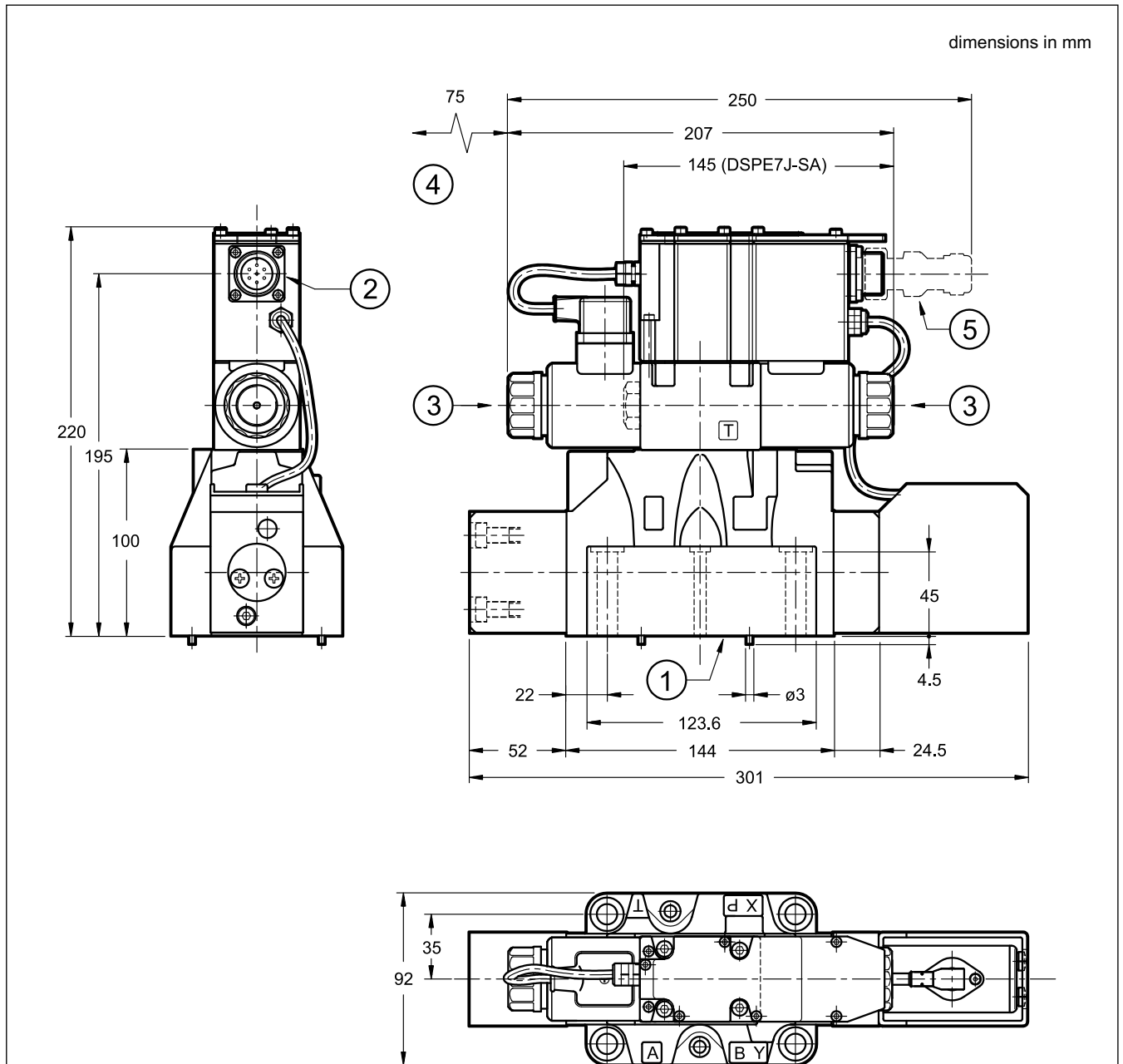
NOTES:

- Overall dimensions with Z option (fixed adjustment pressure reducing valve) at par. 14.
- Mounting surface at par. 15.
- It is recommended to not disassemble the transducer.

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	Manual override embedded in the solenoid tube
4	Coil removal space
5	Mating connector. To be ordered separately. See paragraph 18

Valve fastening: 4 SHC ISO 4762 screws M6x35
Tightening torque: 8 Nm (A8.8 screws)
Threads of mounting holes: M6x10

11 - OVERALL AND MOUNTING DIMENSIONS DSPE7J



NOTES:

- Overall dimensions with Z option (fixed adjustment pressure reducing valve) at par. 14.
- Mounting surface at par. 15.
- It is recommended to not disassemble the transducer.

Valve fastening: 4 SHC screws ISO 4762 M10x60
2 SHC screws ISO 4762 M6x60

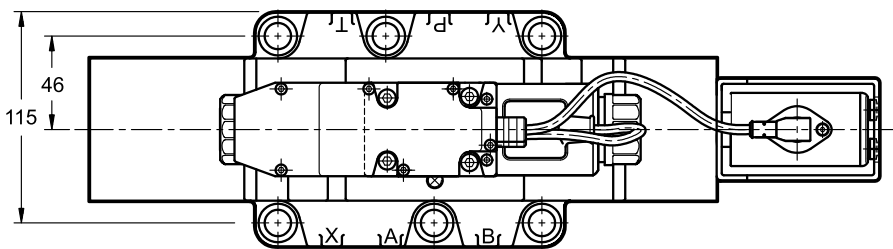
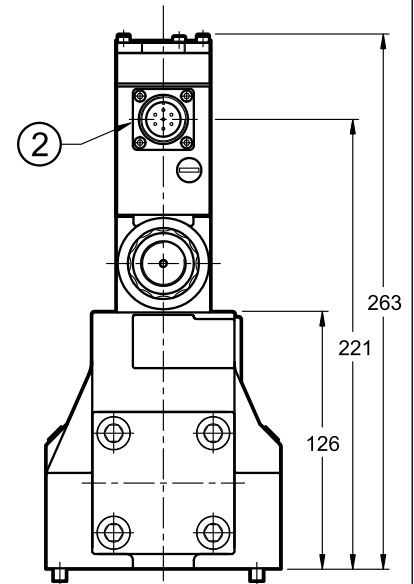
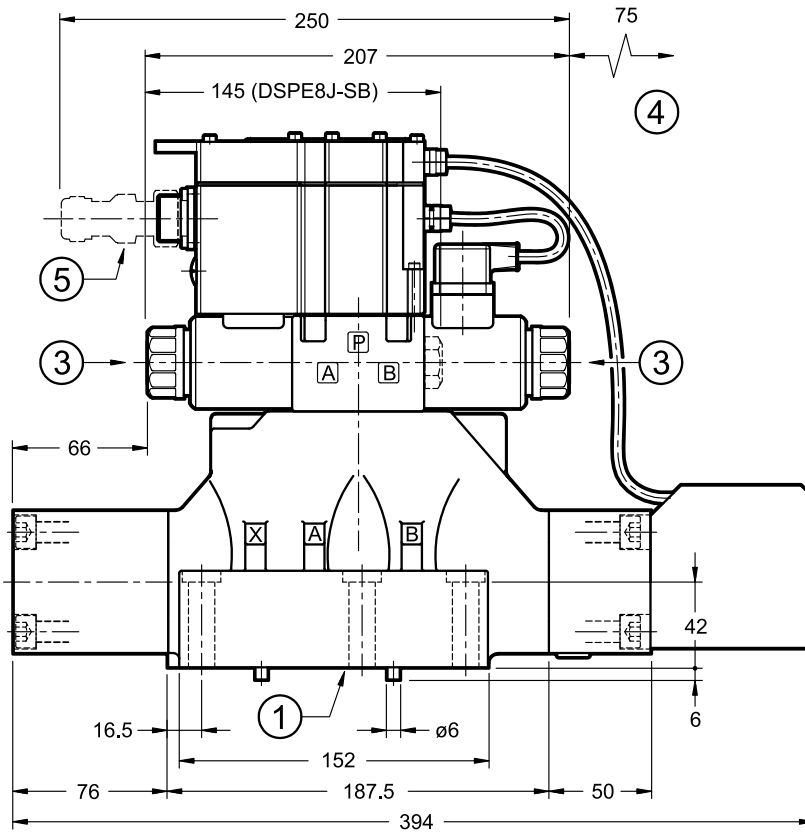
Tightening torque: M10x60: 40 Nm (A8.8 screws)
M6x60: 8 Nm (A8.8 screws)

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	Manual override embedded in the solenoid tube
4	Coil removal space
5	Mating connector. To be ordered separately. See paragraph 18

12 - OVERALL AND MOUNTING DIMENSIONS DSPE8J

dimensions in mm



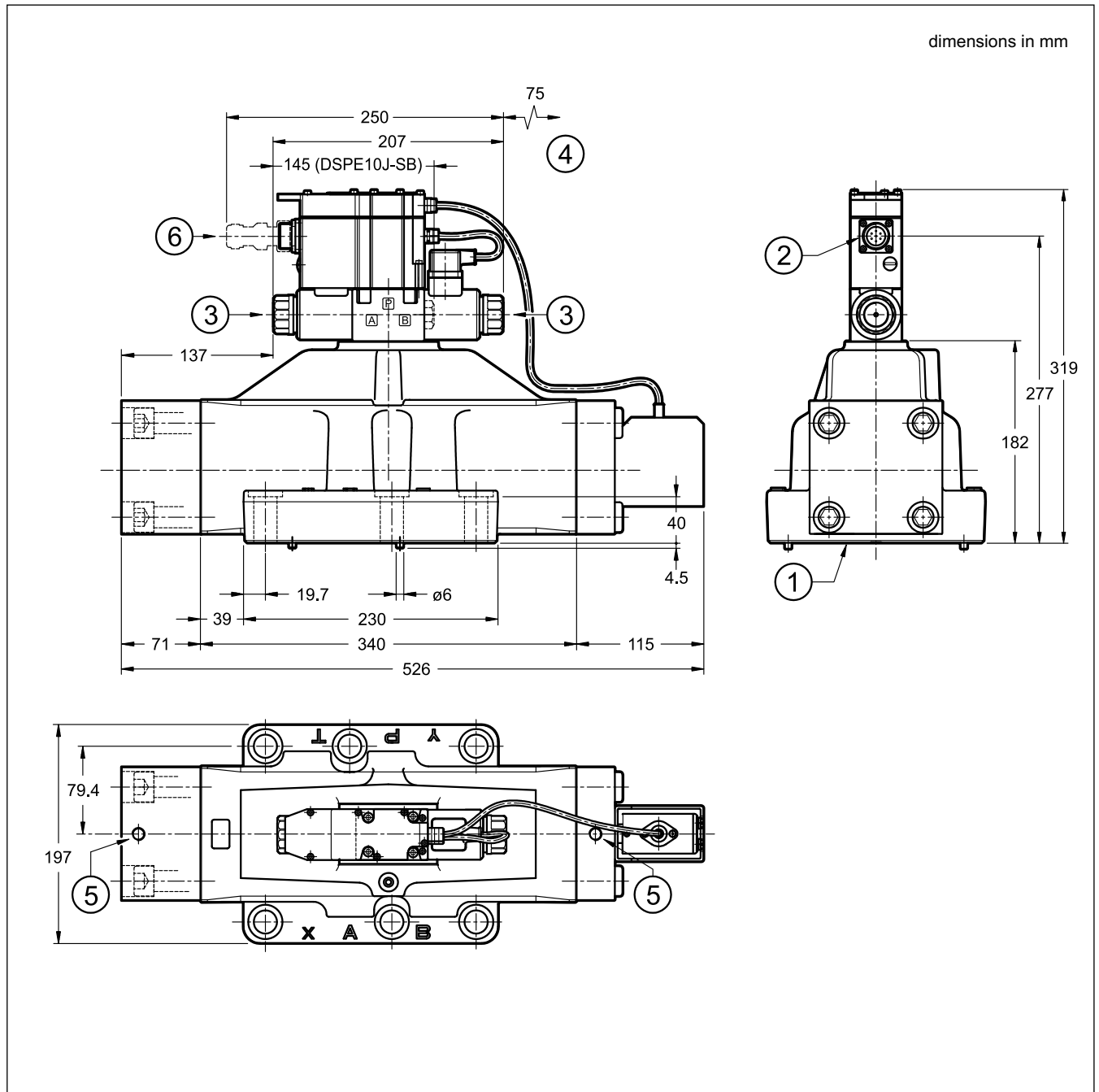
NOTES:

- Overall dimensions with Z option (fixed adjustment pressure reducing valve) at par. 14.
- Mounting surface at par. 15.
- It is recommended to not disassemble the transducer.

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	Manual override embedded in the solenoid tube
4	Coil removal space
5	Mating connector. To be ordered separately. See paragraph 18

Valve fastening: 6 SHC ISO 4762 screws M12x60
Tightening torque: 69 Nm (A8.8 screws)
Threads of mounting holes: M12x20

13 - OVERALL AND MOUNTING DIMENSIONS DSPE10J / DSPE11J



NOTES:

- Overall dimensions with Z option (fixed adjustment pressure reducing valve) at par. 14.
- Mounting surface at par. 15.
- It is recommended to not disassemble the transducer.

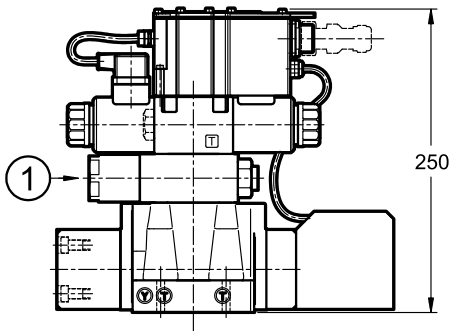
Valve fastening: 6 SHC screws ISO 4762 M20x70
Tightening torque: 330 Nm (A8.8 screws)
Threads of mounting holes: M20x40

1	Mounting surface with sealing rings: DSPE10J 4 OR type 4150 (37.59x3.53) - 90 Shore 2 OR type 3081 (20.24x2.62) - 90 Shore DSPE11J 4 OR type 4212 (53.57x3.53) - 90 Shore 2 OR type 3081 (20.24x2.62) - 90 Shore
2	Main connection
3	Manual override embedded in the solenoid tube
4	Coil removal space
5	N. 2 M12 holes for eyebolts lifting
6	Mating connector. To be ordered separately. See paragraph 18

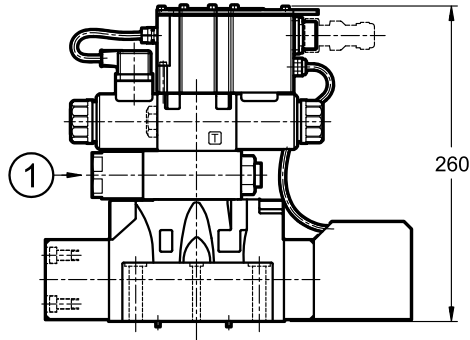
14 - OVERALL AND MOUNTING DIMENSIONS OF DSPE*J WITH PILOTING TYPE Z

dimensions in mm

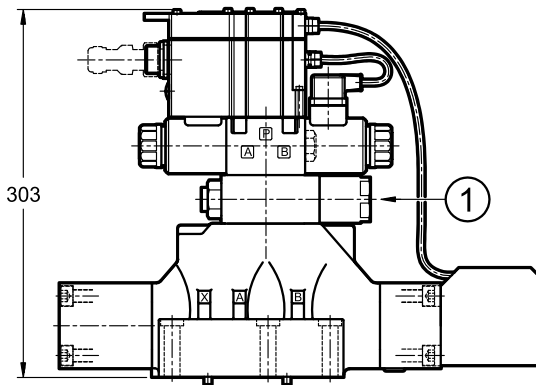
DSPE5J



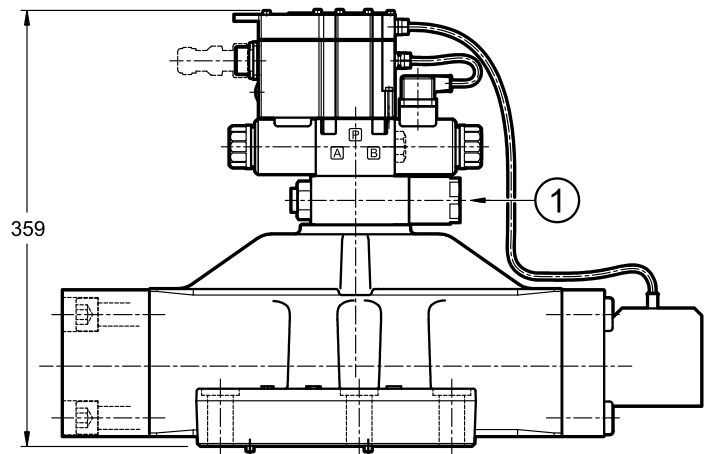
DSPE7J



DSPE8J



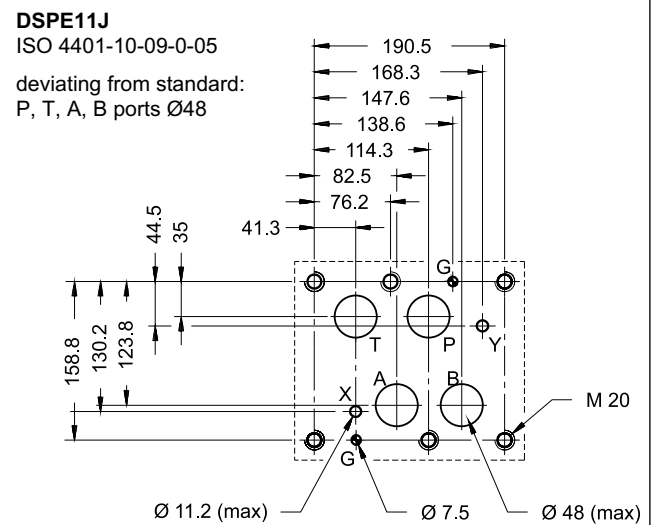
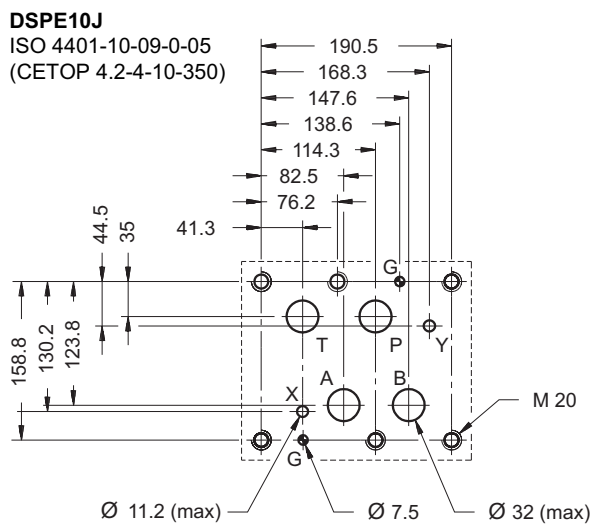
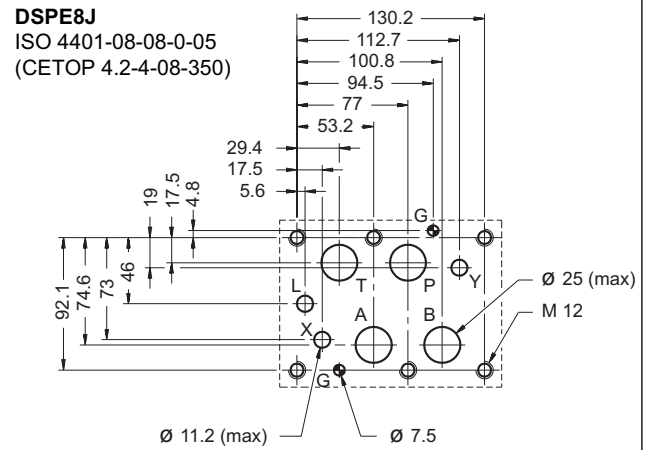
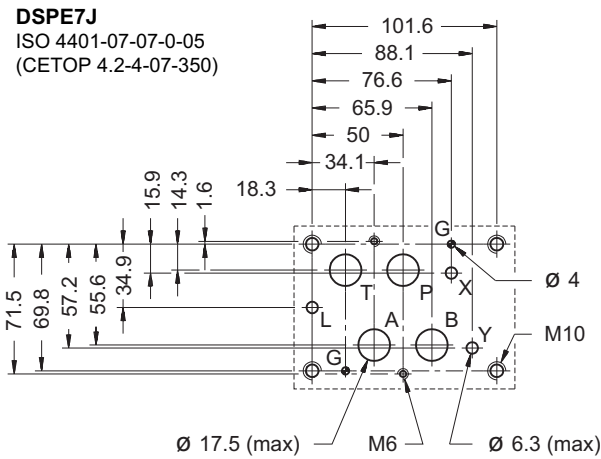
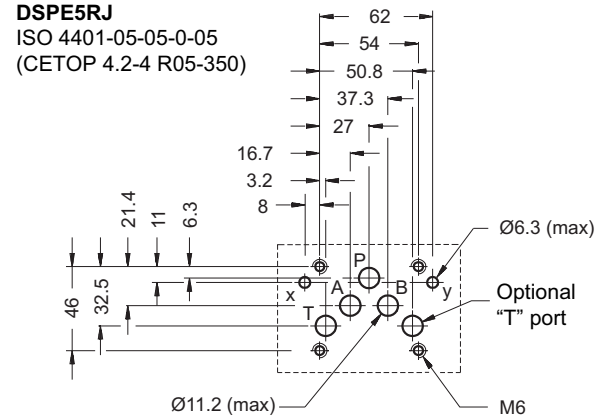
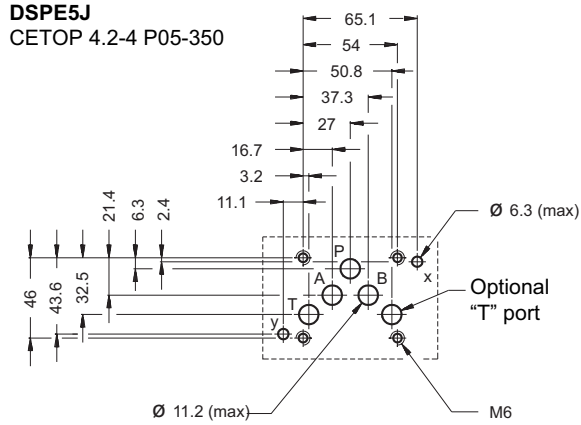
DSPE10J / DSPE11J



1	30 bar fixed adjustment pressure reducing valve
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15 - MOUNTING SURFACES





16 - 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.

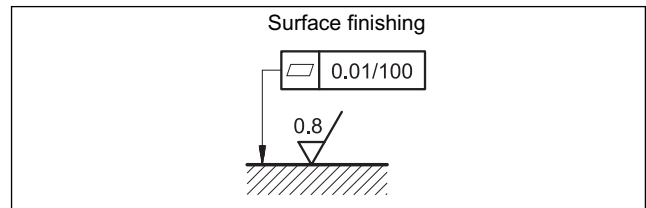
The fluid must be preserved in its physical and chemical characteristics.

17 - INSTALLATION

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

Ensure that there is no air in the hydraulic circuit.

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.



18 - ACCESSORIES

(to be ordered separately)

18.1 - Mating connector

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

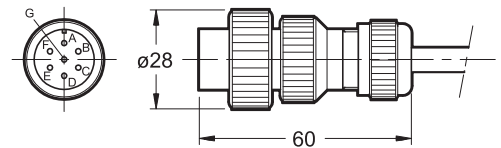


So as to avoid electromagnetic troubles and comply with the electromagnetic compatibility regulation EMC, it is recommended the use of a metal connector.

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

Diplomatic offers a metal cable connector type MIL-C-5015-G (EN 175201-804).

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



18.2 - Connection cables size

Power supply:

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

Signal: 0,50 mm²

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

18.3 - Kit for start-up LINPC-USB

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

19 - SUBPLATES

(see catalogue 51 000)

	DSPE5J	DSPE7J	DSPE8J	DSPE10J DSPE11J
Type with rear ports	PME4-AI5G	PME07-AI6G	-	-
Type with side ports	PME4-AL5G	PME07-AL6G	PME5-AL8G	-
P, T, A, B ports dimensions	3/4" BSP	1" BSP	1 1/2" BSP	-
X, Y ports dimensions	1/4" BSP	1/4" BSP	1/4" BSP	-



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