



DSPE*G

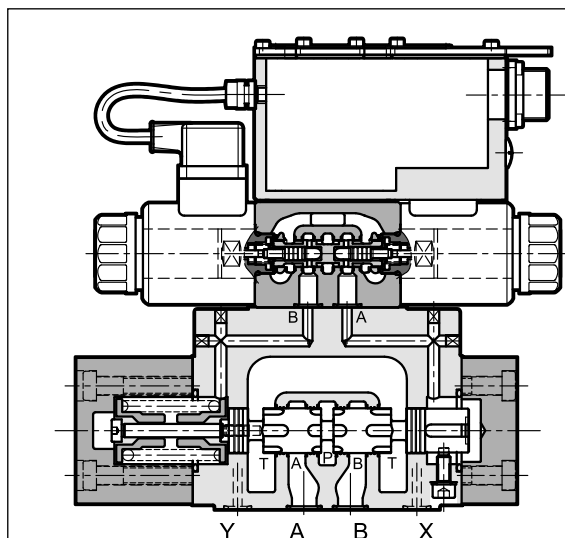
PROPORTIONAL DIRECTIONAL VALVES, PILOT OPERATED WITH INTEGRATED ELECTRONICS

SERIES 31

SUBPLATE MOUNTING

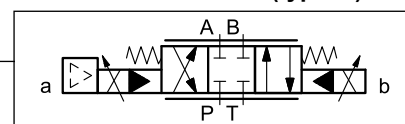
DSPE5R	CETOP P05
DSPE5RG	ISO 4401-05
DSPE7G	ISO 4401-07
DSPE8G	ISO 4401-08
DSPE10G	ISO 4401-10
DSPE11G	ISO 4401-10 oversize ports

OPERATING PRINCIPLE



- The DSPE*G are pilot operated directional control valves with electric proportional control and integrated electronics and with mounting interface in compliance with ISO 4401 standards.
- They are controlled directly by an integrated digital amplifier.
- 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 solenoid current monitoring signal 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. 19)

HYDRAULIC SYMBOL (typical)



PERFORMANCES

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

		DSPE5G DSPE5RG	DSPE7G	DSPE8G	DSPE10G	DSPE11G
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	< 2 %				
Repeatability	% Q max	< ± 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 18/16/13				
Recommended viscosity	cSt	25				
Mass: single solenoid valve double solenoid valve	kg	7,4 7,9	9,6 10,1	15,9 16,4	52,8 53,3	52,5 53



1 - IDENTIFICATION CODE

D	S	P	E		G	-				/	31		-			/		K11		
---	---	---	---	--	---	---	--	--	--	---	----	--	---	--	--	---	--	-----	--	--

Pilot operated directional valve

Electric proportional control

Nominal size: _____
5 = CETOP P05
5R = ISO 4401-05
7 = ISO 4401-07
8 = ISO 4401-08
10 = ISO 4401-10
11 = ISO 4401-10 with oversize ports

Integrated electronics for open loop

Spool type: _____
C = closed centres
A = open centres
RC = regenerative closed centers
RA = regenerative open centers

Spool nominal flow rate (see table par. 2) _____

Configurations for single solenoid version (omit for double solenoid version) :
SA = 1 solenoid for cross configuration (for DSPE5G, DSPE5RG and DSPE7G only)
SB = 1 solenoid for parallel configuration (for DSPE8G, DSPE10G and DSPE11G only)

Option: manual override (see par. 10)

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

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

Piloting: **I** = internal
E = external
Z = internal piloting with 30 bar fixed adjustment pressure reducing valve (see par. 8 and 15)

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)

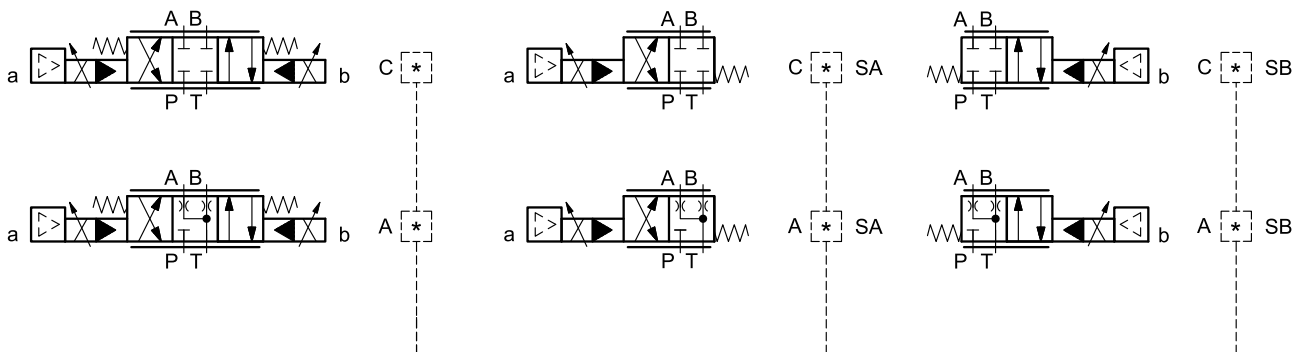
2 - AVAILABLE VERSIONS

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

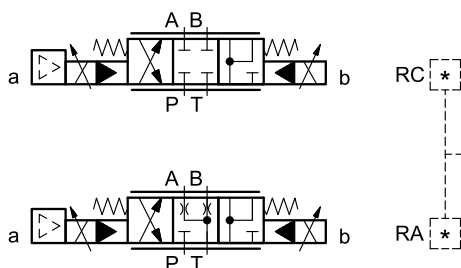
2 solenoids:
3 positions with spring centering

1 solenoid for cross configuration "SA":
2 positions (central + external)
with spring centering
**for DSPE5G, DSPE5RG and DSPE7G
only**

1 solenoid for parallel configuration "SB":
2 positions (central + external)
with spring centering
**for DSPE8G, DSPE10G and DSPE11G
only**



valve type	*	Nominal flow with Δp 10 bar P-T
DSPE5G DSPE5RG	80	80 l/min
	80 / 40	80 (P-A) / 40 (B-T) l/min
DSPE7G	100	100 l/min
	150	150 l/min
	150 / 75	150 (P-A) / 75 (B-T) l/min
DSPE8G	200	200 l/min
	300	300 l/min
	300 / 150	300 (P-A) / 150 (B-T) l/min
DSPE10G	350	350 l/min
	500	500 l/min
	500 / 250	500 (P-A) / 250 (B-T) l/min
DSPE11G	800	800 l/min
	800 / 500	800 (P-A) / 500 (B-T) l/min



valve type	*	Nominal flow with Δp 10 bar P-T
DSPE7G	150/75	150 (P-A) / 75 (B-T) l/min
DSPE8G	300/150	300 (P-A) / 150 (B-T) l/min
DSPE10G	500/250	500 (P-A) / 250 (B-T) l/min



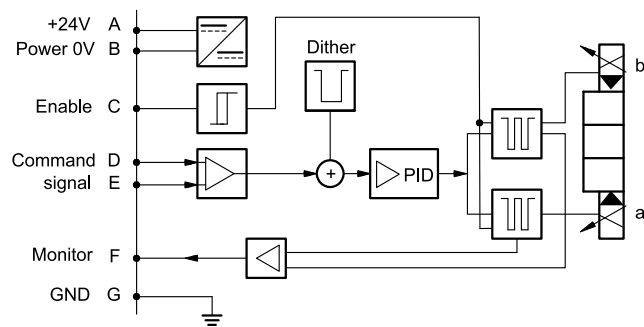
3 - ELECTRICAL CHARACTERISTICS

3.1 - Electrical on board electronics

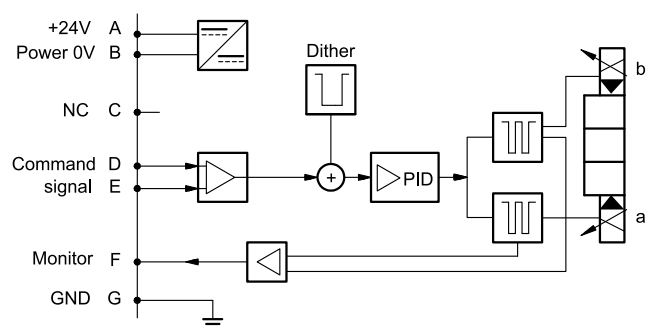
Duty cycle		100% (continuous operation)
Protection class according to IEC 60529		IP65 / IP67
Supply voltage	V DC	24 (from 19 to 30 VDC), ripple max 3 Vpp
Power consumption	VA	25
Maximum solenoid current	A	1.88
Fuse protection, external		3A
Command signals: voltage (E0) current (E1)	V DC mA	± 10 (Impedance $R_i > 11 \text{ k}\Omega$) $4 \div 20$ (Impedance $R_i = 58 \text{ }\Omega$)
Monitor signal (current to solenoid): voltage (E0) current (E1)	V DC mA	± 10 (Impedance $R_o > 1 \text{ k}\Omega$) $4 \div 20$ (Impedance $R_o = 500 \text{ }\Omega$)
Managed breakdowns		Overload and electronics overheating, cable breakdown, 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 2014/30/EU standards

3.2 - On-board electronics diagrams

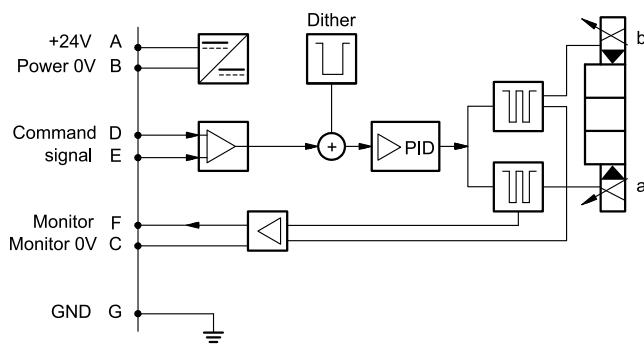
VERSION A - External Enable



VERSION B - Internal Enable

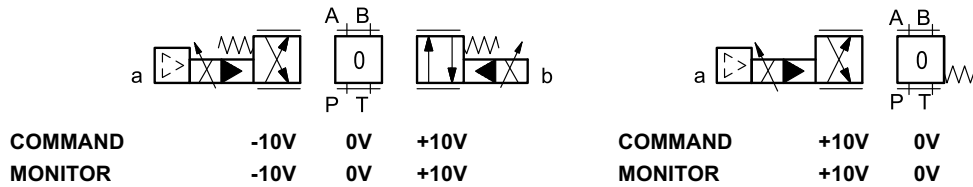


VERSION C - 0V Monitor



4 - VERSIONS WITH VOLTAGE COMMAND (E0)

The reference signal is between -10V and +10V on double solenoid valves, 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.

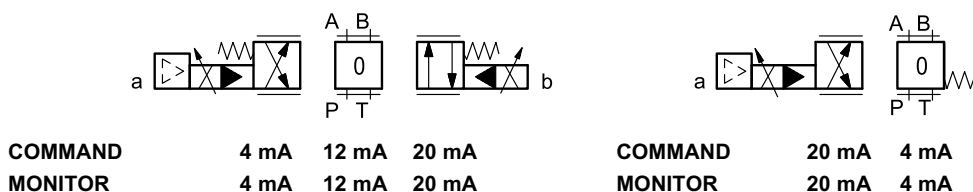


Pin	Values	version A	version B	version C
A	24 V DC	Supply Voltage		
B	0V			
C		Enable 24 V DC	not used -	PIN F reference 0 V
D	± 10 V	Command (differential input)		
E	0V	PIN D reference		
F	± 10 V	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (Earth)		

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.



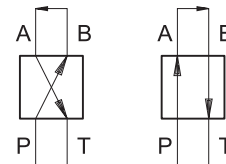
Pin	Values	version A	version B	version C
A	24 V DC	Supply Voltage		
B	0V			
C		Enable 24 V DC	not used -	PIN F reference 0 V
D	4 ÷ 20 mA	Command		
E	0V	PIN D reference		
F	4 ÷ 20 mA	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (Earth)		

6 - CHARACTERISTIC CURVES

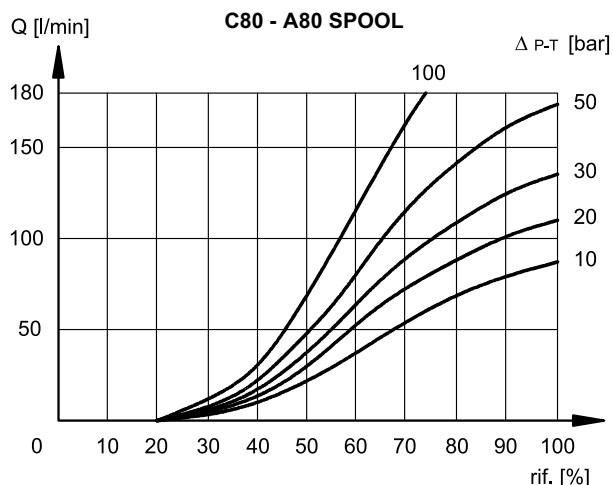
(obtained with mineral oil with viscosity of 36 cSt at 50°C and $p = 140$ bar)

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.

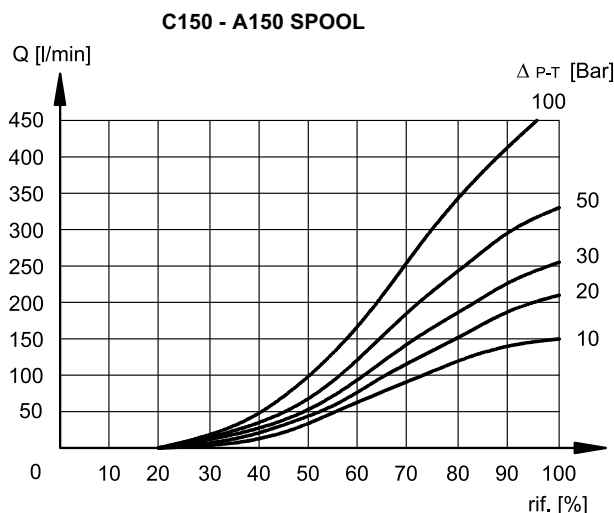
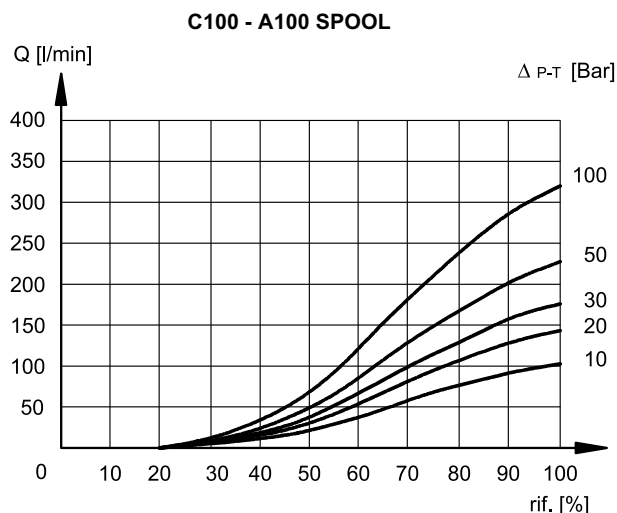
The adjustment of the curve is performed with a constant Δp of 30 bar by setting the value of flow start at 20% of the reference signal.



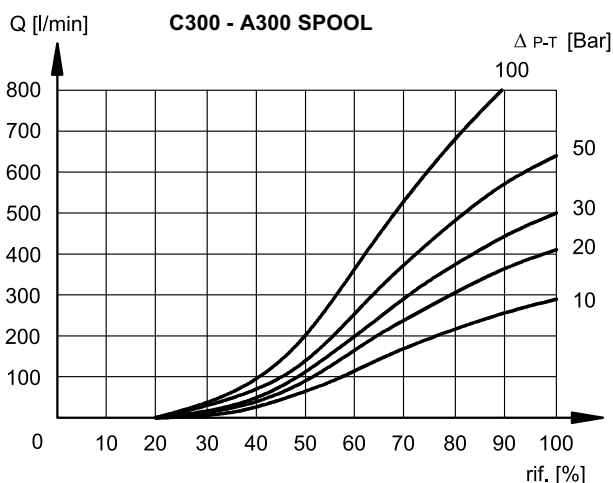
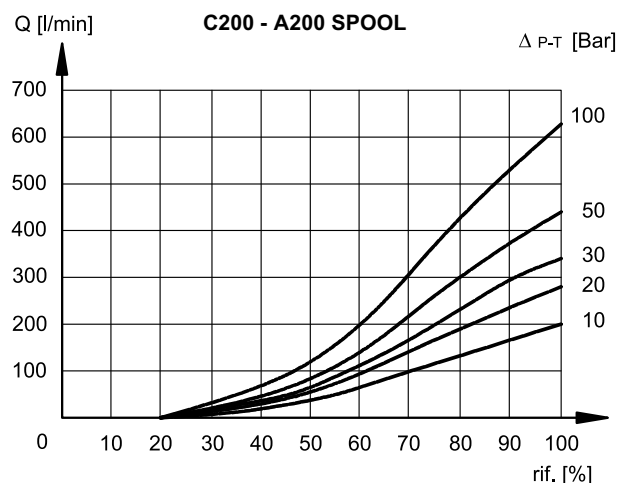
6.1 - Characteristic curves DSPE5G and DSPE5RG



6.2 - Characteristic curves DSPE7G

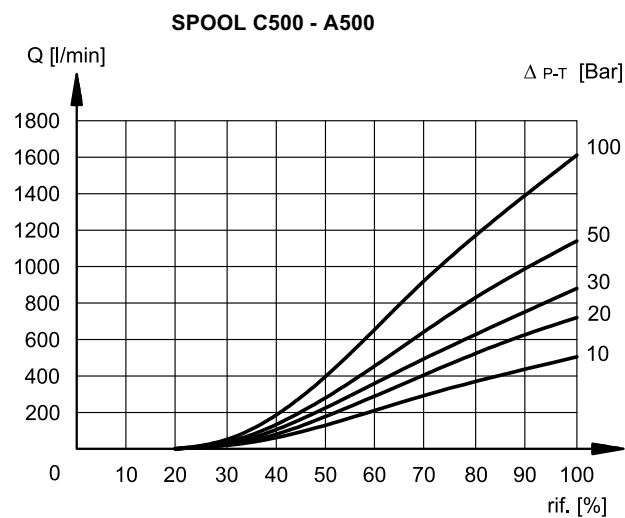
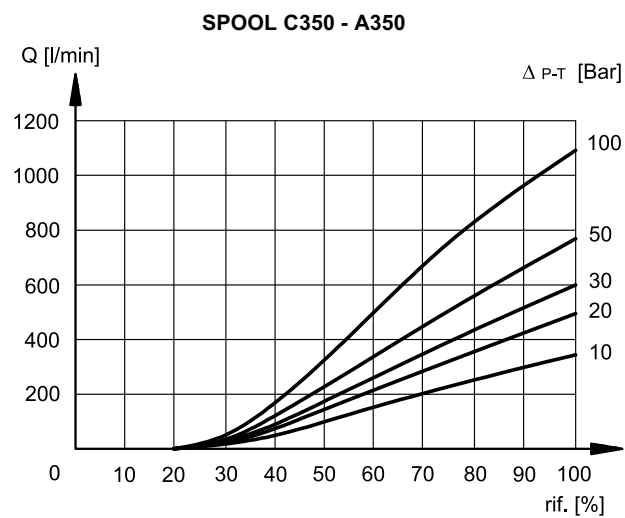


6.3 - Curve Characteristic DSPE8G

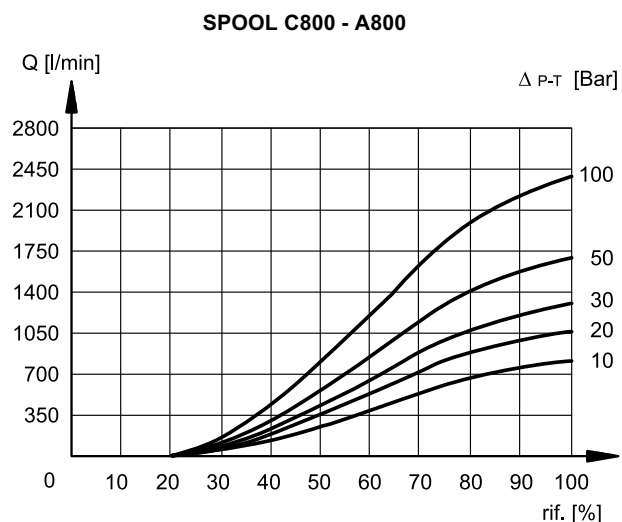




6.4 - Characteristic curves DSPE10G



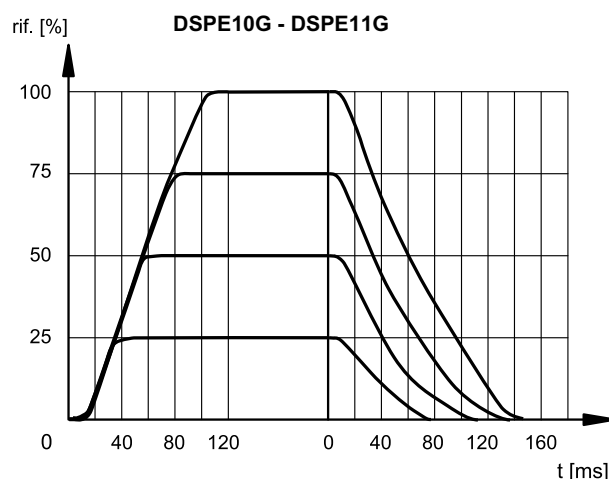
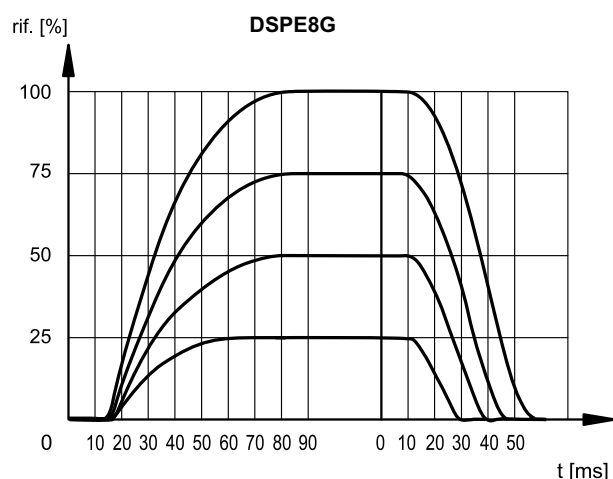
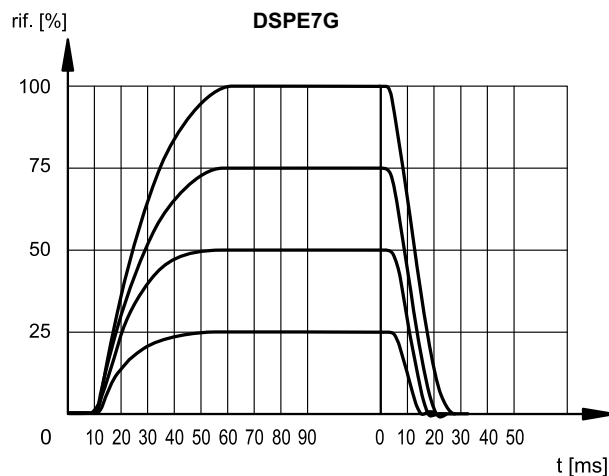
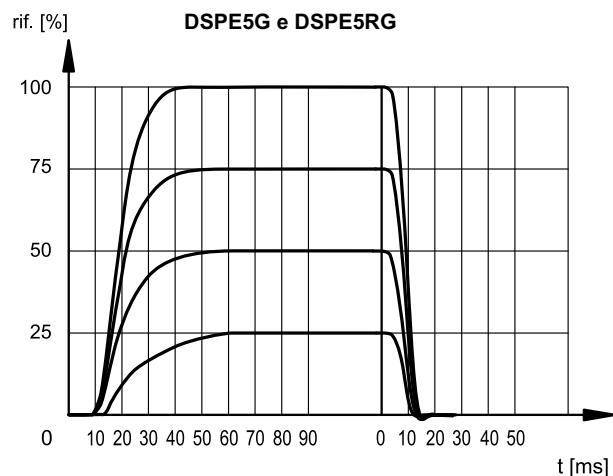
6.5 - Characteristic curves DSPE11G





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 and static pressure = 100 bar)

FLOWRATES		DSPE5G DSPE5RG	DSPE7G	DSPE8G	DSPE10G	DSPE11G
Max flow rate	l/min	180	450	800	1600	2800
Piloting flow requested with operation 0 → 100%	l/min	3,5	4,1	9,2	13,7	13,7
Piloting volume requested with operation 0 → 100%	cm ³	1,7	3,2	9,1	21,6	21,6

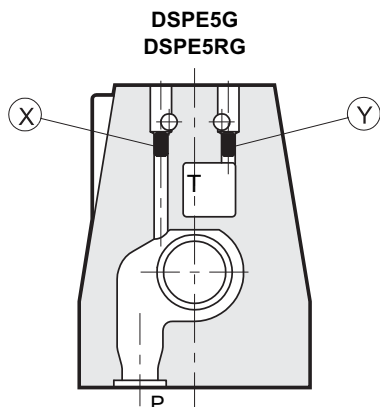
PRESSURES (bar)	MIN	MAX
Piloting pressure on X port	30	210 (NOTE)
Pressure on T port with internal drain	—	10
Pressure on T port with external drain	—	250

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).

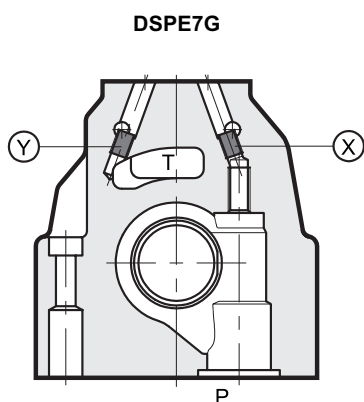
9 - PILOTING AND DRAINAGE

DSPE*G 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.

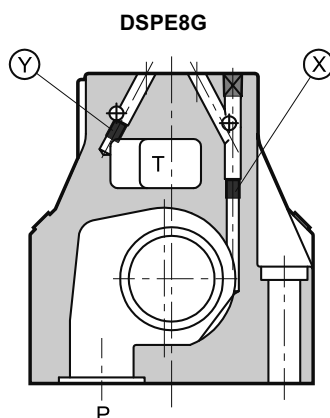


X: plug M5x6 for external pilot
Y: plug M5x6 for external drain

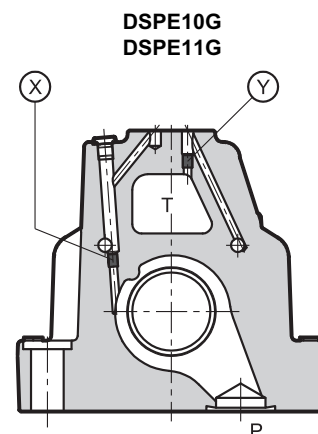
TYPE OF VALVE		Plug assembly	
		X	Y
IE	INTERNAL PILOT AND EXTERNAL DRAIN	NO	YES
II	INTERNAL PILOT AND INTERNAL DRAIN	NO	NO
EE	EXTERNAL PILOT AND EXTERNAL DRAIN	YES	YES
EI	EXTERNAL PILOT AND INTERNAL DRAIN	YES	NO



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



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



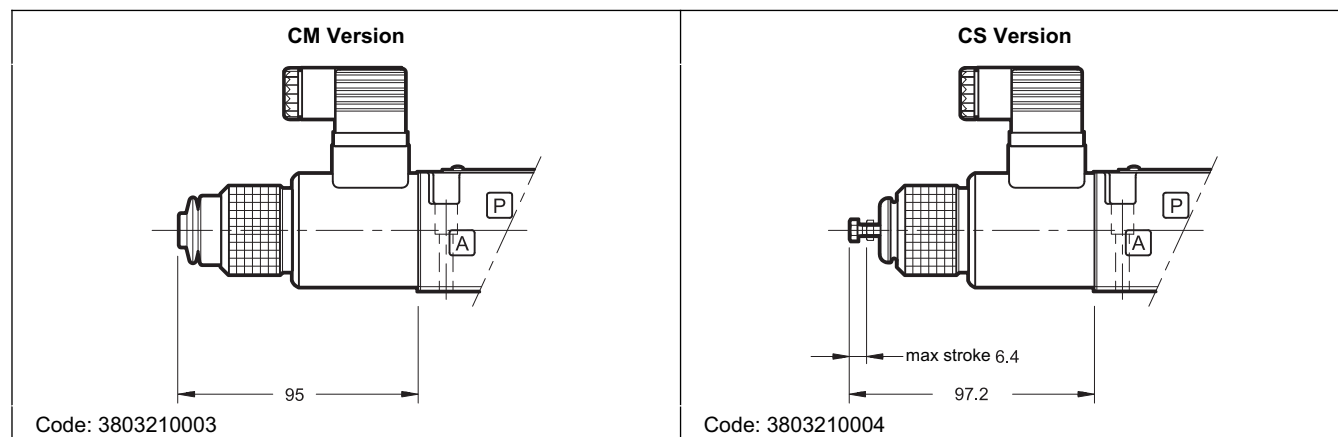
X: plug M6x8 for external pilot
Y: plug M6x8 for external drain

10 - MANUAL OVERRIDE

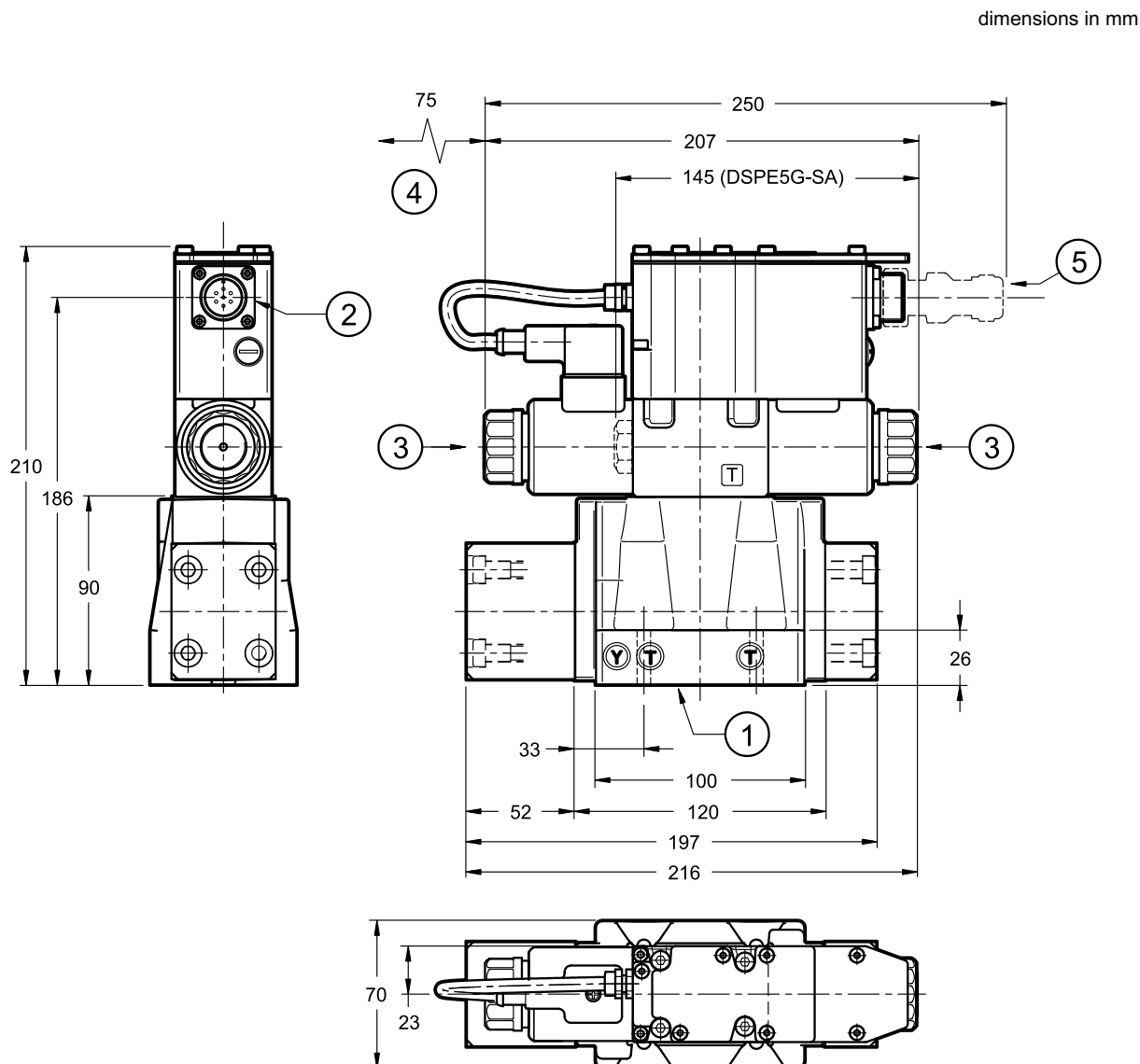
The standard valve has solenoids whose pin for the manual operation is integrated in the tube. The operation of this control must be executed with a suitable tool, minding not to damage the sliding surface.

Two different manual override version are available upon request:

- **CM** version, manual override belt protected
- **CS** version, with metal ring nut provided with a M4 screw and a blocking locknut to allow the continuous mechanical operations.



11 - OVERALL AND MOUNTING DIMENSIONS DSPE5G AND DSPE5RG



NOTES:

- Overall dimensions with Z option (fixed adjustment pressure reducing valve) at par. 15.
- Mounting surface at par. 16.

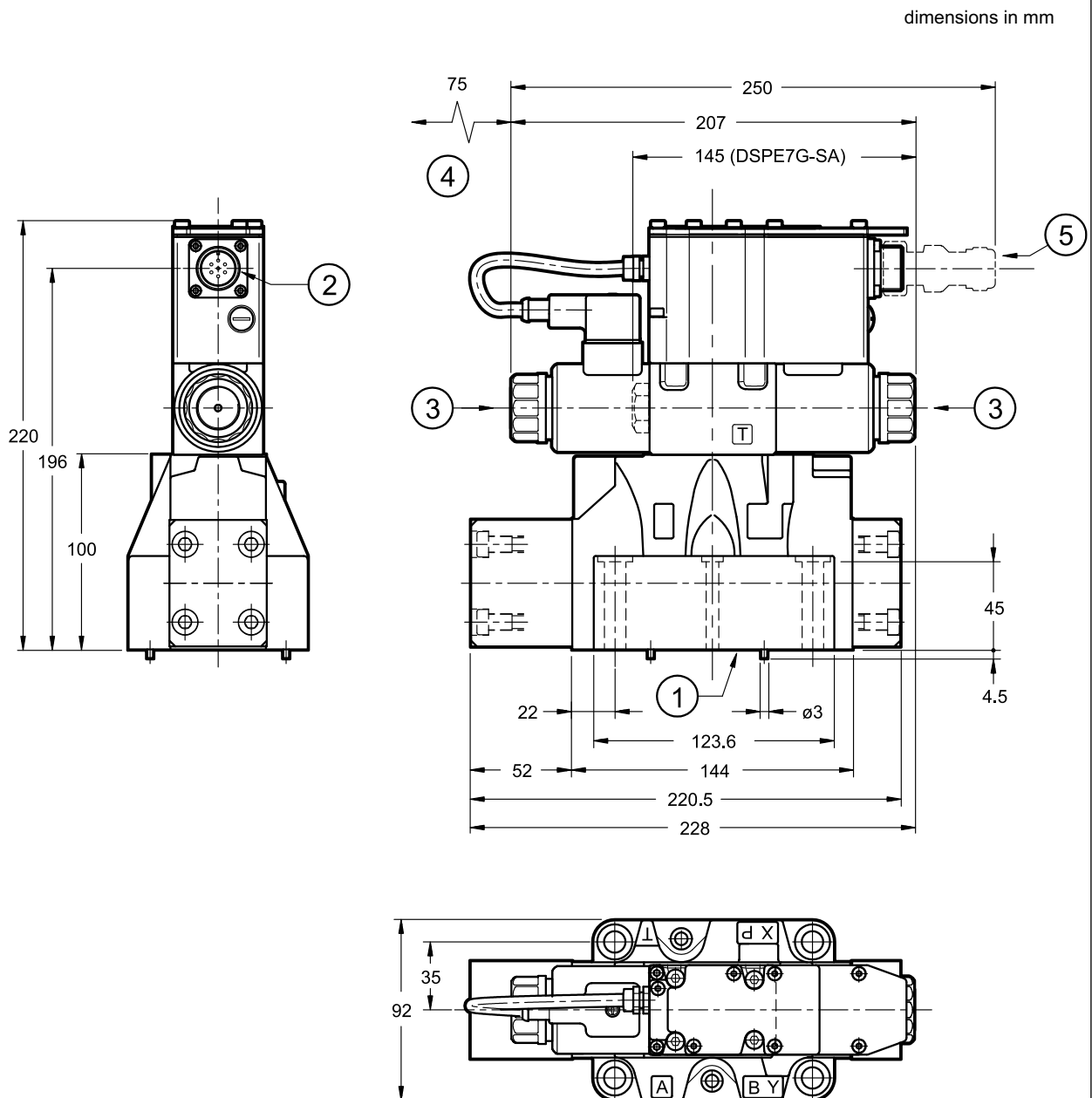
1	Mounting surface with sealing rings: 5 OR type 2050 (12.42x1.78) - 90 Shore 2 OR type 2037 (9.25x1.78) - 90 Shore
2	Main connection
3	Standard manual override embedded in the solenoid tube
4	Coil removal space
5	Mating connector. To be ordered separately. See paragraph 19

Valve fastening: 4 SHC ISO 4762 screws M6x35

Tightening torque: 8 Nm (A8.8 screws)

Threads of mounting holes: M6x10

12 - OVERALL AND MOUNTING DIMENSIONS DSPE7G



NOTES:

- Overall dimensions with Z option (fixed adjustment pressure reducing valve) at par. 15.
- Mounting surface at par. 16.

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

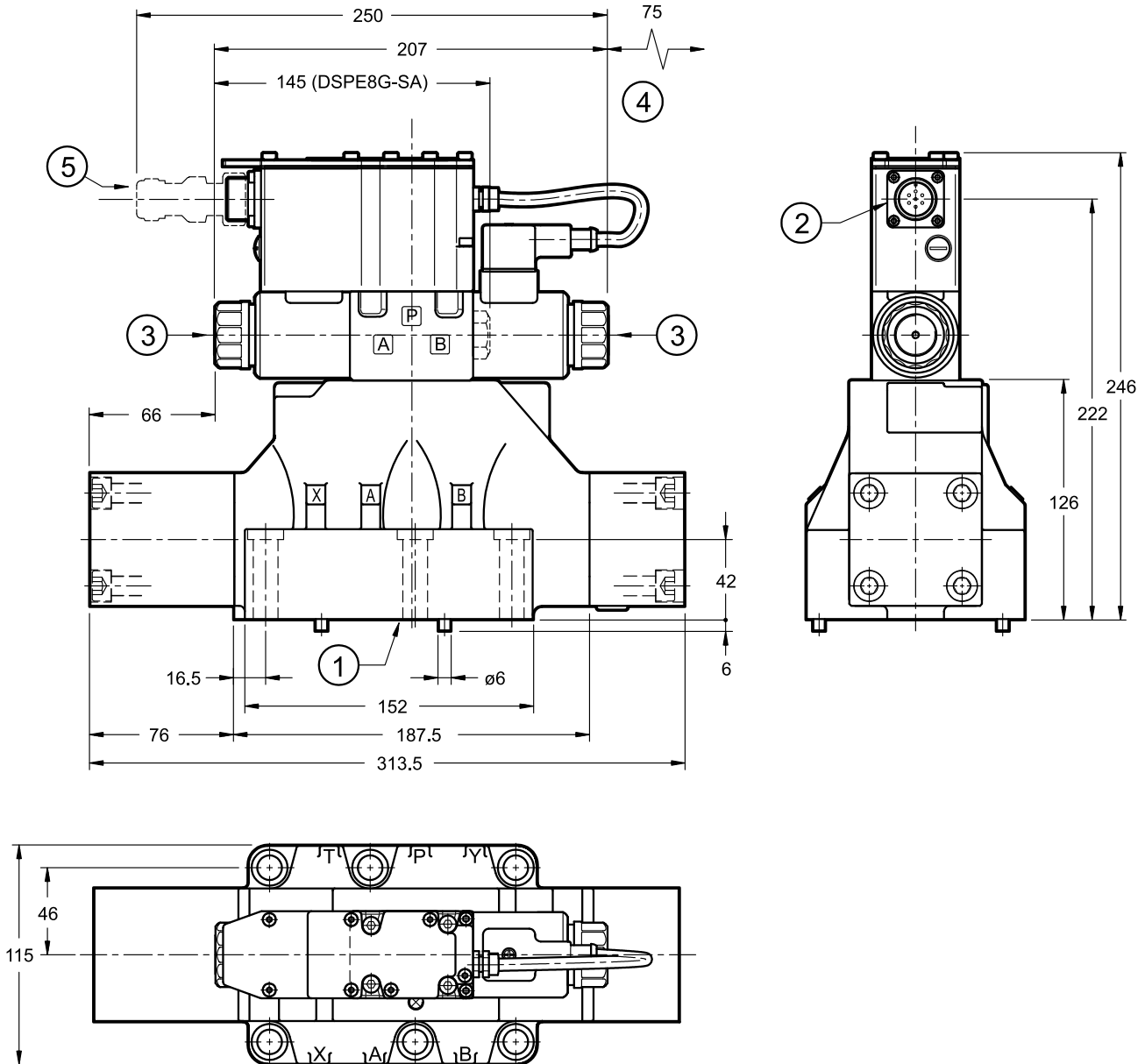
Tightening torque: M10x60: 40 Nm (A8.8 screws)
M6x60: 8 Nm (A8.8 screws)

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	Standard manual override embedded in the solenoid tube
4	Coil removal space
5	Mating connector. To be ordered separately. See paragraph 19

13 - OVERALL AND MOUNTING DIMENSIONS DSPE8G

dimensions in mm



NOTES:

- Overall dimensions with Z option (fixed adjustment pressure reducing valve) at par. 15.
- Mounting surface at par. 16.

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	Standard manual override embedded in the solenoid tube
4	Coil removal space
5	Mating connector. To be ordered separately. See paragraph 19

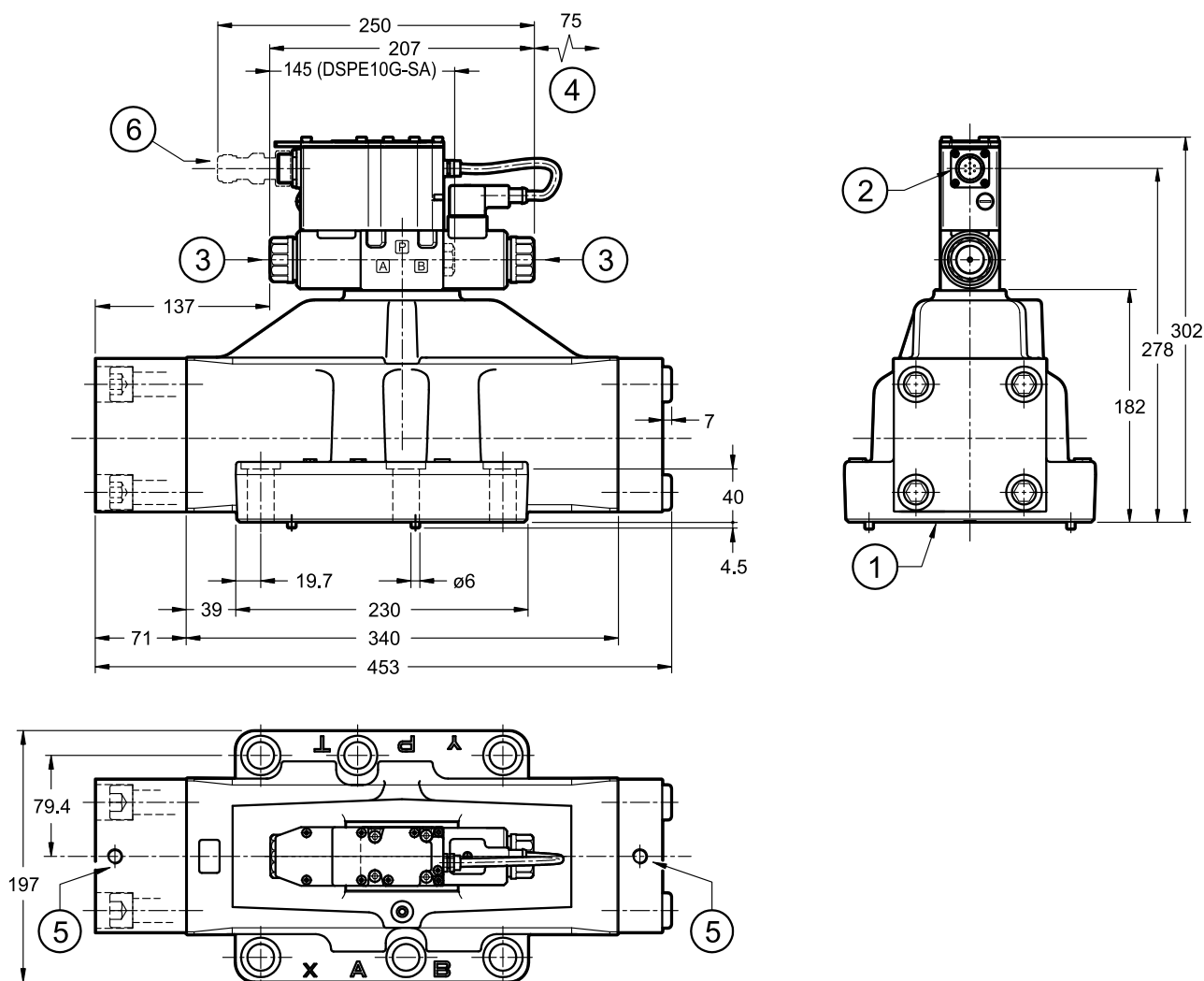
Valve fastening: 6 SHC ISO 4762 screws M12x60

Tightening torque: 69 Nm (A8.8 screws)

Threads of mounting holes: M12x20

14 - OVERALL AND MOUNTING DIMENSIONS DSPE10G / DSPE11G

dimensions in mm



NOTES:

- Overall dimensions with Z option (fixed adjustment pressure reducing valve) at par. 15.
- Mounting surface at par. 16.

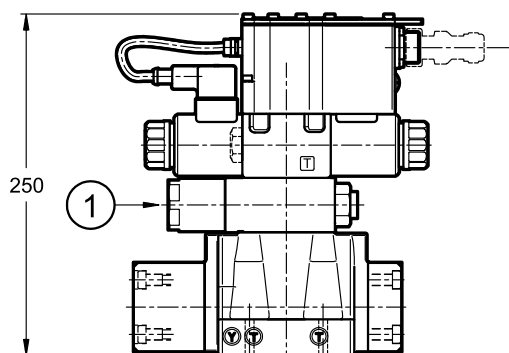
Valve fastening: 6 SHC screws ISO 4762 M20x70
Tightening torque: 330 Nm (A8.8 screws)
Threads of mounting holes: M20x40

1	Mounting surface with sealing rings: DSPE10G 4 OR type 4150 (37.59x3.53) - 90 Shore 2 OR type 3081 (20.24x2.62) - 90 Shore DSPE11G 4 OR type 4212 (53.57x3.53) - 90 Shore 2 OR type 3081 (20.24x2.62) - 90 Shore
2	Main connection
3	Standard 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 19

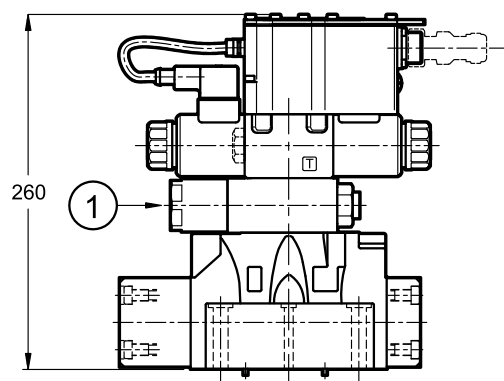
15 - OVERALL AND MOUNTING DIMENSIONS OF DSPE*G WITH PILOTING TYPE Z

dimensions in mm

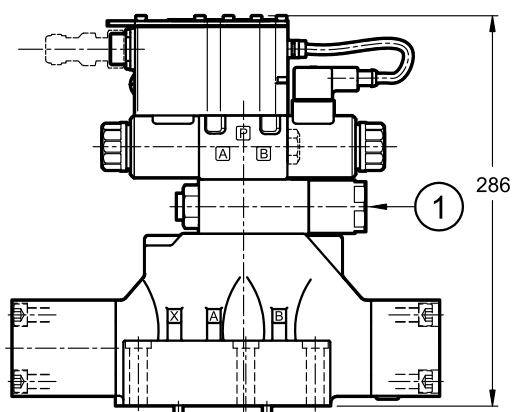
DSPE5G



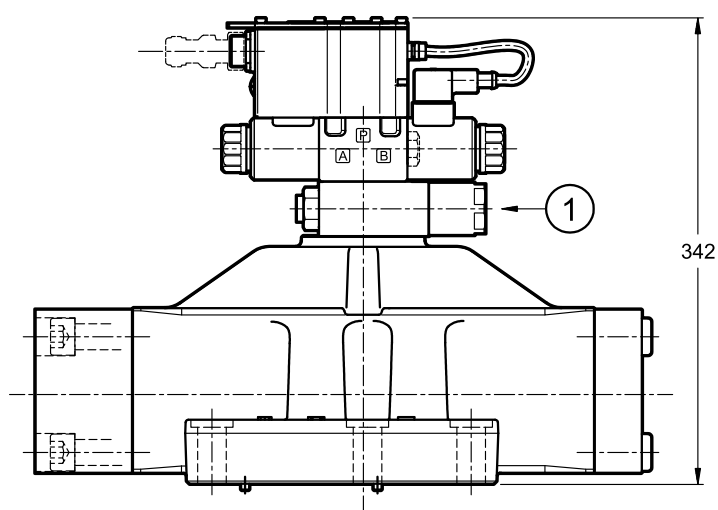
DSPE7G



DSPE8G



DSPE10G

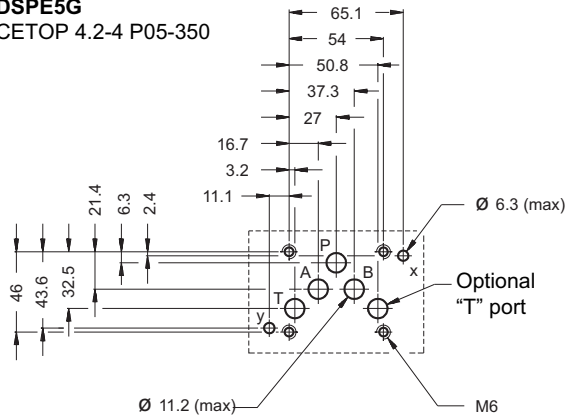


1	30 bar fixed adjustment pressure reducing valve
---	---

16 - MOUNTING SURFACES

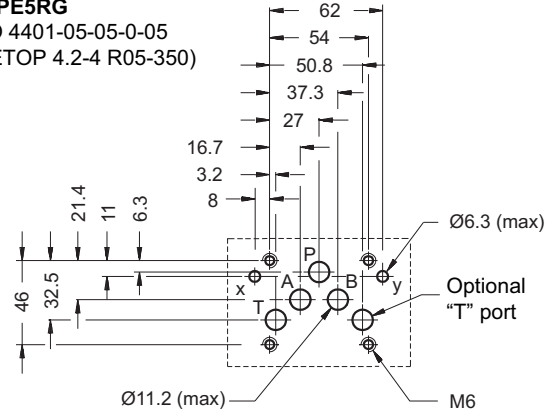
DSPE5G

CETOP 4.2-4 P05-350



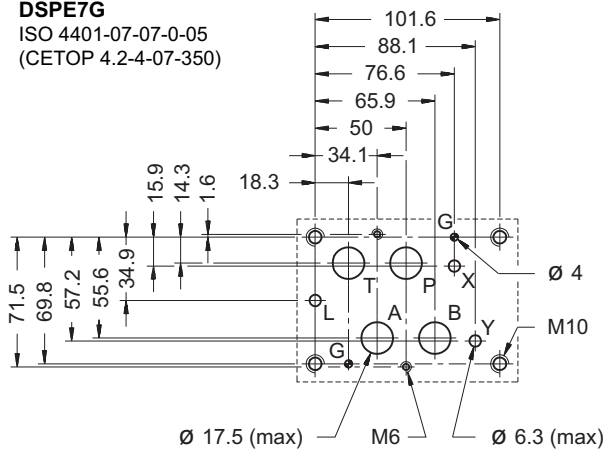
DSPE5RG

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



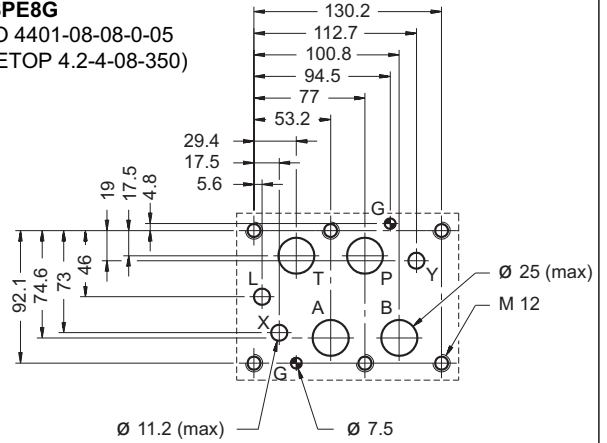
DSPE7G

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



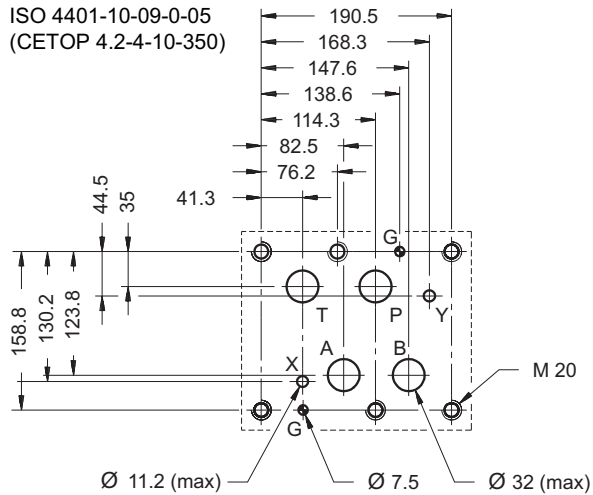
DSPE8G

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



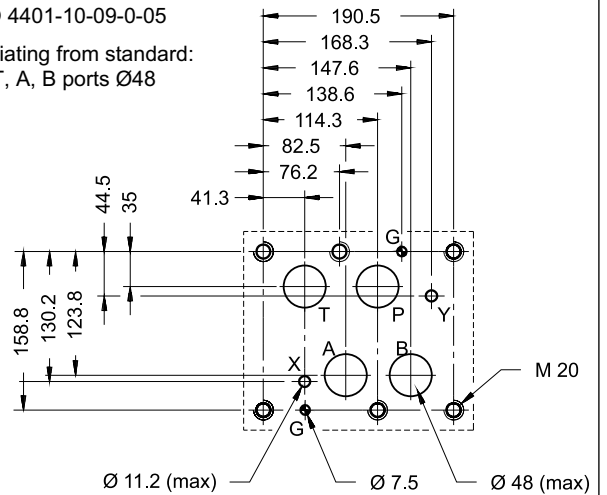
DSPE10G

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



DSPE11G

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





17 - 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.

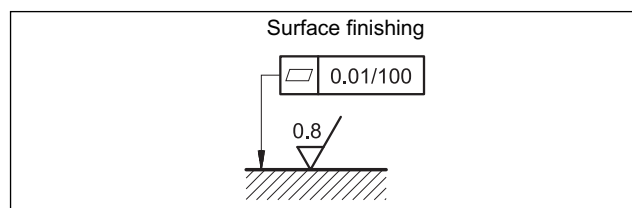
The fluid must be preserved in its physical and chemical characteristics.

18 - 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.



19 - ACCESSORIES

(to be ordered separately)

19.1 - Mating connector

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

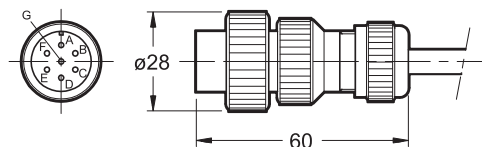


So as to avoid electromagnetic troubles and comply with the electromagnetic compatibility regulation EMC, it is recommended the use of a metal connector.

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

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

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



19.2 - 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.

19.3 - Kit for start-up LINPC-USB

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

20 - SUBPLATES

(see catalogue 51 000)

	DSPE5G	DSPE7G	DSPE8G	DSPE10G DSPE11G
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	-



DUPLOMATIC OLEODINAMICA S.p.A.

20015 PARABIAGO (MI) • Via M. Re Depaolini 24

Tel. +39 0331.895.111

Fax +39 0331.895.339

www.duplomatic.com • e-mail: sales.exp@duplomatic.com