



DSE3G

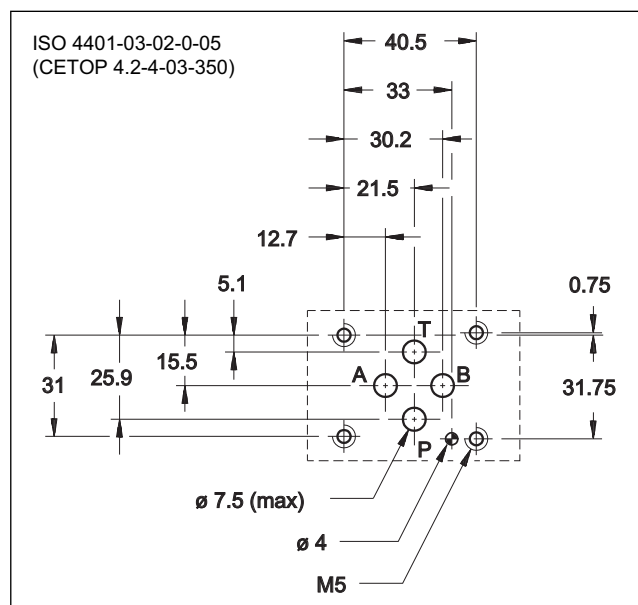
DIRECTIONAL VALVE WITH PROPORTIONAL CONTROL AND INTEGRATED ELECTRONICS SERIES 31

SUBPLATE MOUNTING ISO 4401-03

p max 350 bar

Q max 40 l/min

MOUNTING INTERFACE

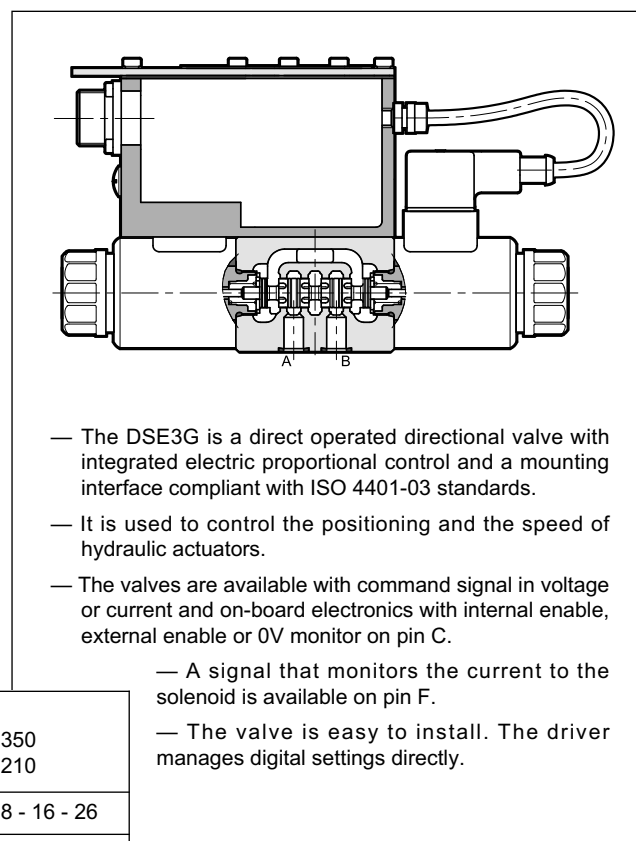


PERFORMANCES

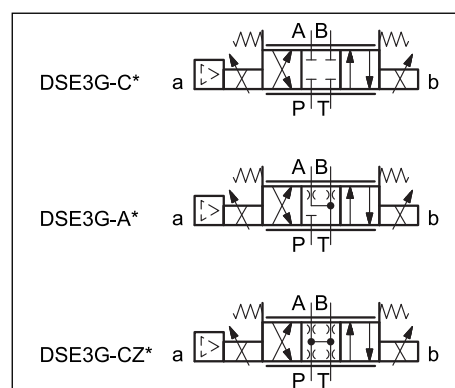
(obtained with mineral oil with viscosity of 36 cSt at 50°C and p = 140 bar)

Max operating pressure: - P - A - B ports - T port	bar	350 210
Nominal flow with Δp 10 bar P-T	l/min	1 - 4 - 8 - 16 - 26
Response times	see paragraph 7	
Hysteresis	% of Q max	< 3%
Repeatability	% of Q max	< $\pm 1\%$
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	1,9 2,4

OPERATING PRINCIPLE



HYDRAULIC SYMBOLS (typical)



1 - IDENTIFICATION CODE

D	S	E	3	G	-				/ 31	-		K11	/	
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Direct operated directional control valve

Electric proportional control

Size ISO 4401-03

Digital integrated electronics for open loop

Spool type:
C = closed centres
A = open centres
CZ = closed centres with overlap jump

Nominal flow rate of the spool (see chart par. 2)

Solenoid position (omit for 2 solenoids configuration):
SA = 1 solenoid on side A

Option:
manual override (see paragraph 8)

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 $4 \div 20$ mA

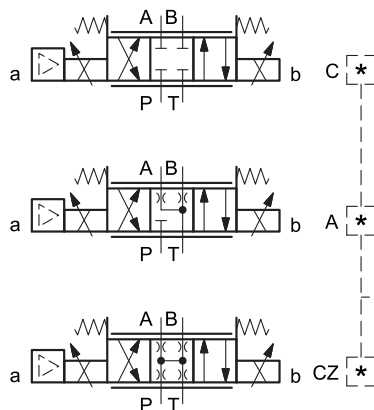
Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

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

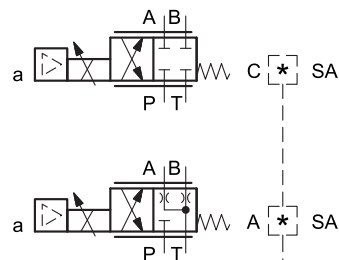
2 - CONFIGURATIONS

Valve configuration depends on the combination of the following elements:
 number of proportional solenoids, spool type, rated flow.

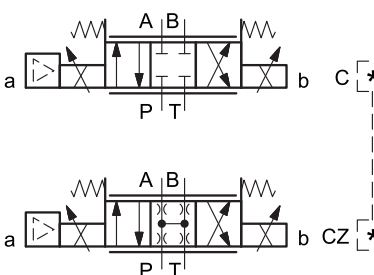
Configuration 2 solenoids :
 3 positions with spring centering



Configuration 1 solenoid on side A "SA":
 2 positions (central + external)
 with spring centering



*	Controlled flow with $\Delta p 10$ bar P-T
04	4 l/min
08	8 l/min
16	16 l/min
16/08	16 (P-A) / 08 (B-T) l/min
26	26 l/min
26/13	26 (P-A) / 13 (B-T) l/min



*	Controlled flow with $\Delta p 10$ bar P-T
01R	1 l/min

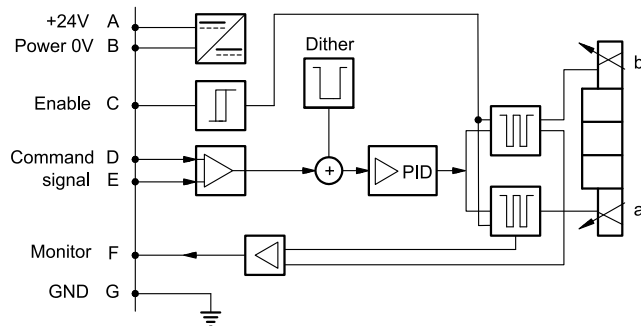
3 - ELECTRICAL CHARACTERISTICS

3.1 - Electrical on board electronics

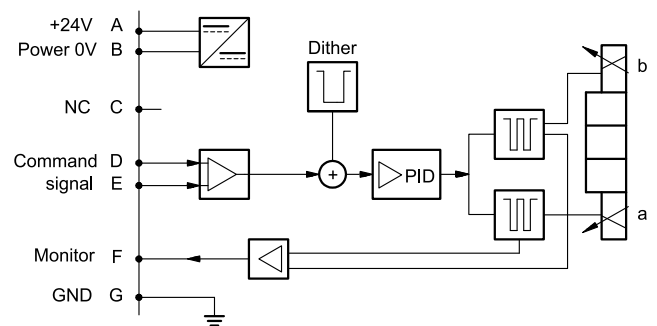
Duty cycle		100% (continuous operation)
Protection class according to EN 60529		IP65 / IP67
Supply voltage	V DC	24 (from 19 to 30 VDC), ripple max 3 Vpp
Power consumption	VA	25
Maximum solenoid current	A	1.88
Fuse protection, external		3A
Command signals: voltage (E0) current (E1)	V DC mA	± 10 (Impedence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

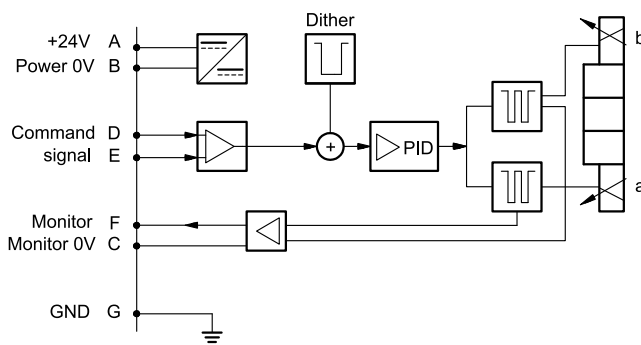
VERSION A - External Enable



VERSION B - Internal Enable

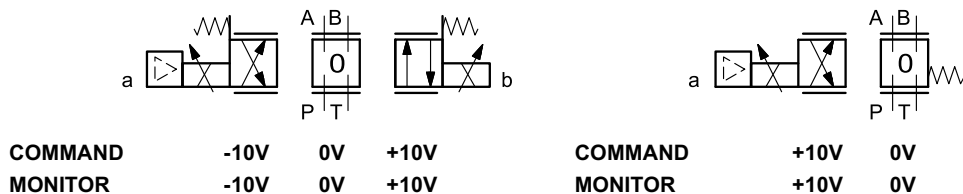


VERSION C - 0V Monitor



4 - VERSIONS WITH VOLTAGE COMMAND (E0)

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

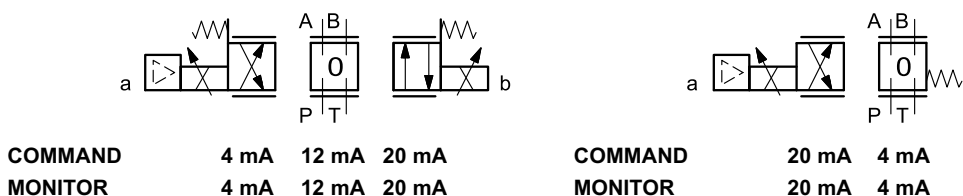


Pin	Values	version A	version B	version C
A	24 V DC	Supply Voltage		
B	0 V			
C		Enable 24 V DC	not used -	PIN F reference 0 V
D	± 10 V	Command (differential input)		
E	0 V	PIN D reference		
F	± 10 V	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (Earth)		

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

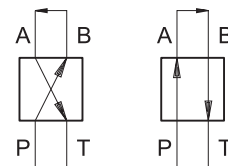
6 - CHARACTERISTIC CURVES

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

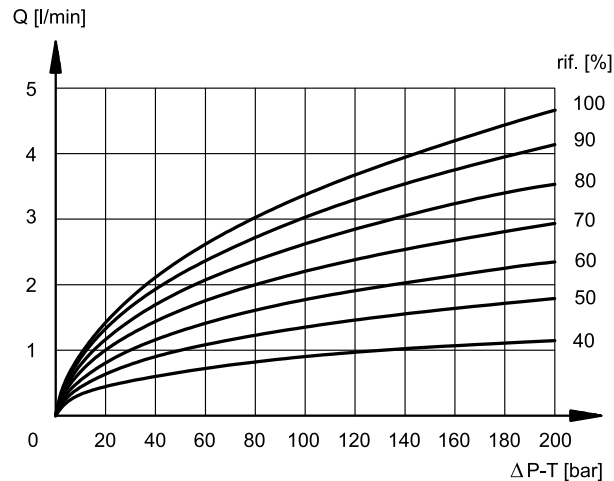
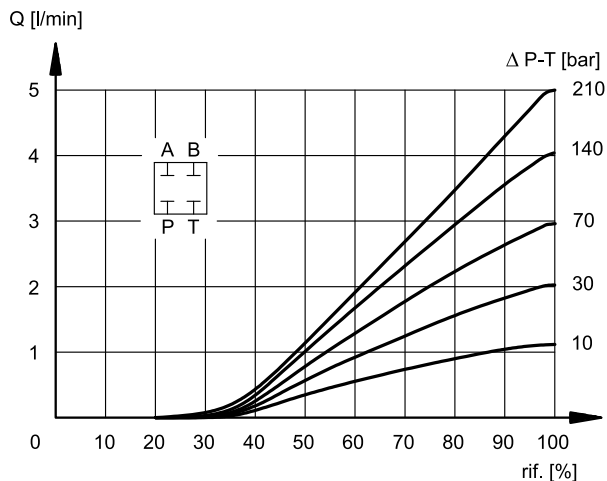
Typical flow rate curves at constant Δp related to the reference signal and measured for the available spools. The Δp values are measured between P and T valve ports.

The curves are obtained after linearization in factory of the characteristic curve through the digital amplifier. The linearization of the curve is performed with a constant Δp of 5 bar and by setting the value of flow start at 20% of the reference signal.

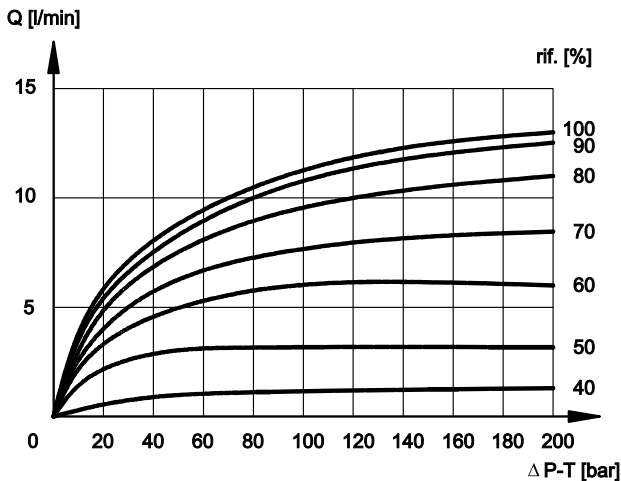
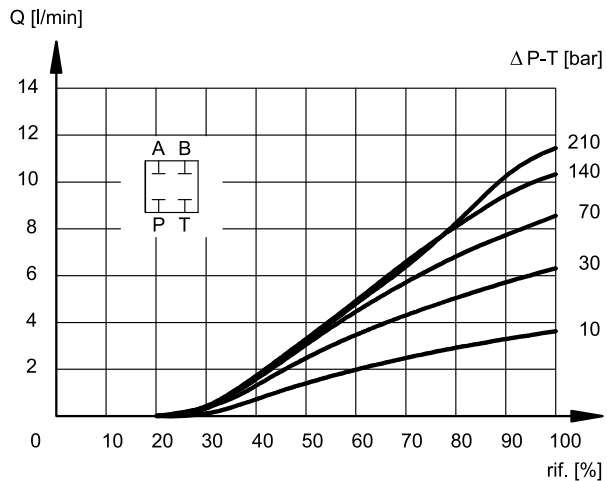
NOTE: for the zero overlap spool (Z), please refer to the characteristic curves of C type spool, considering that the starting flow rate value is approx. 150 mV.



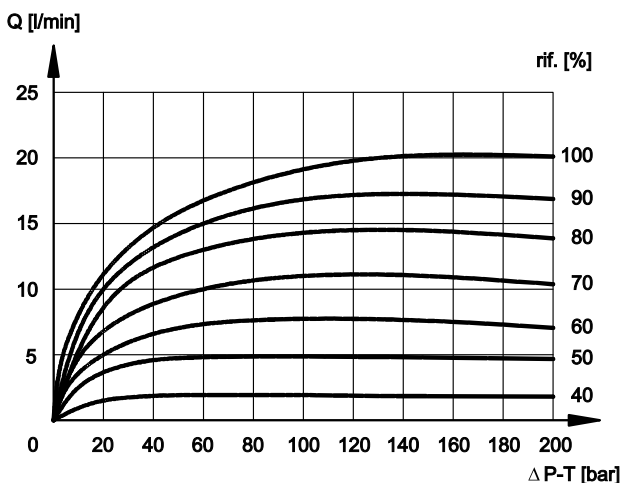
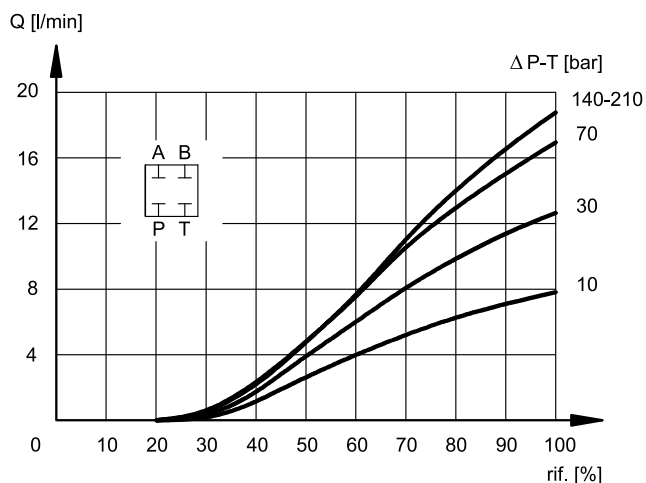
SPOOL TYPE C01R



SPOOL TYPE C04



SPOOL TYPE C08

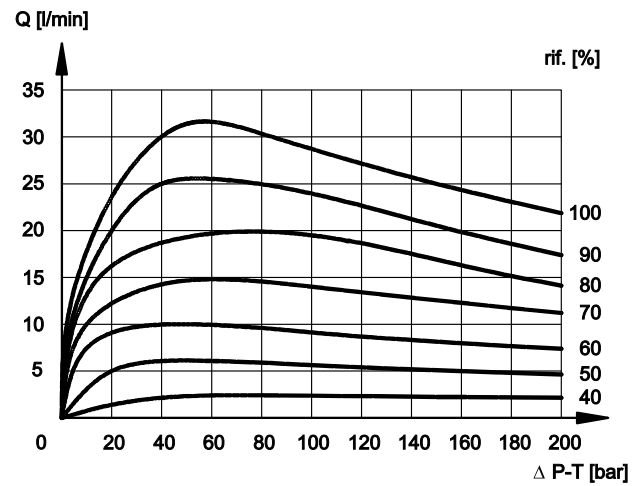
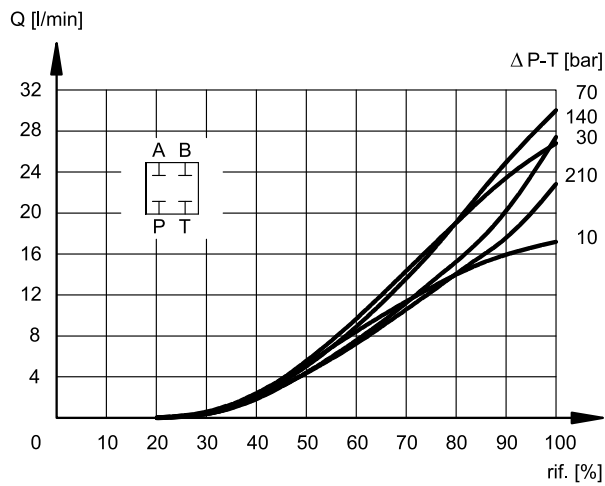




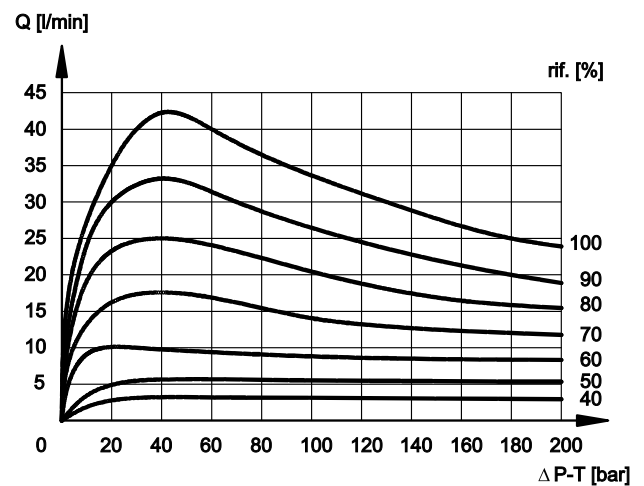
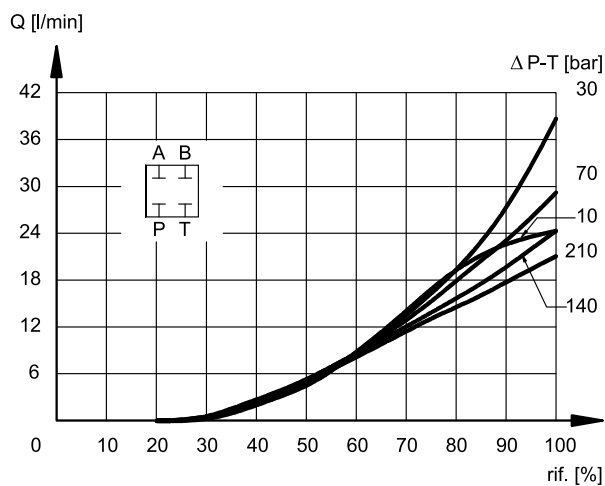
DSE3G

SERIES 31

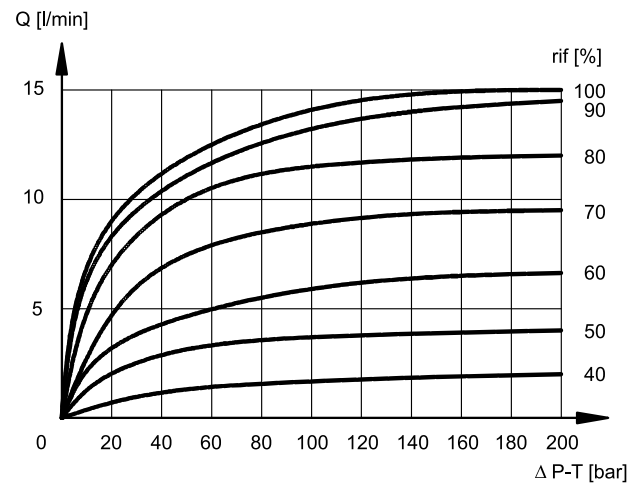
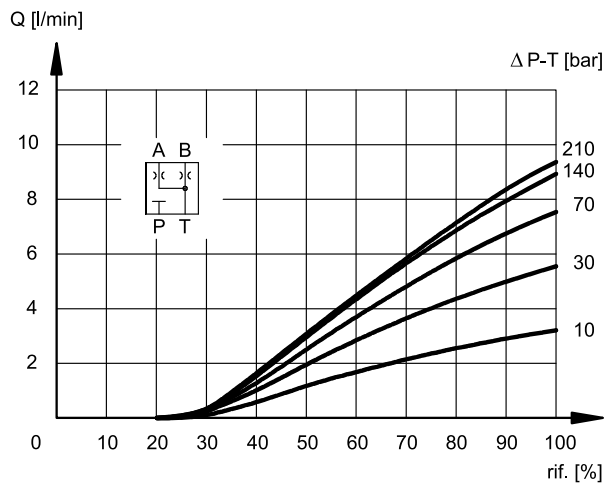
SPOOL TYPE C16



SPOOL TYPE C26

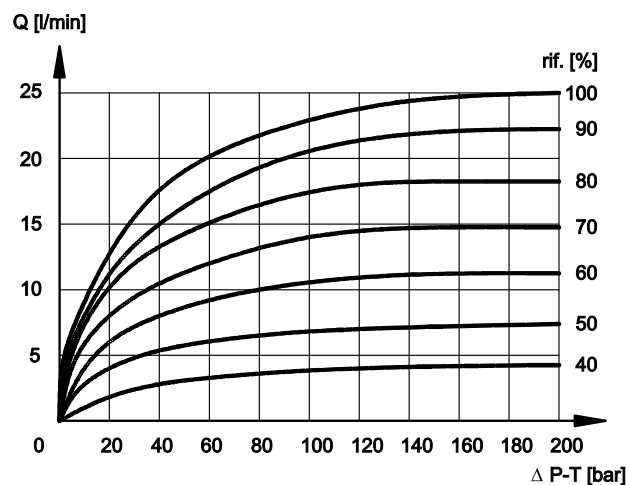
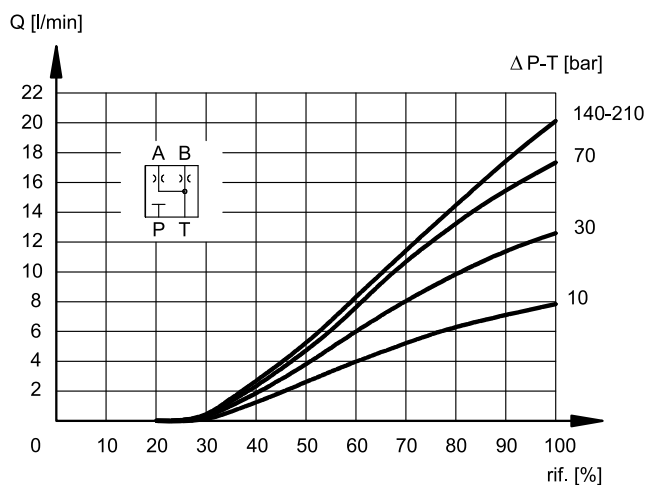


SPOOL TYPE A04

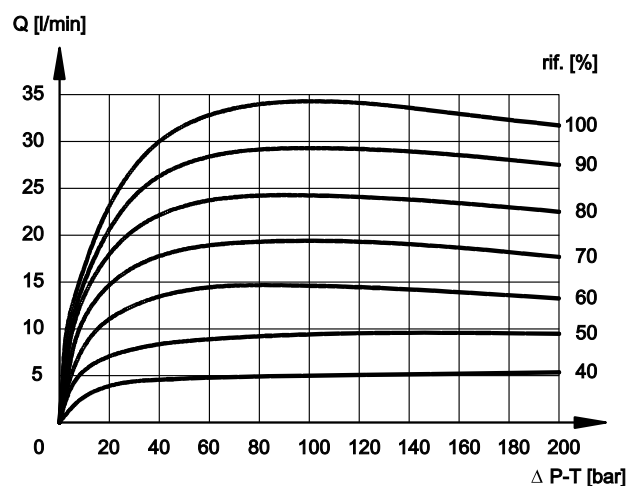
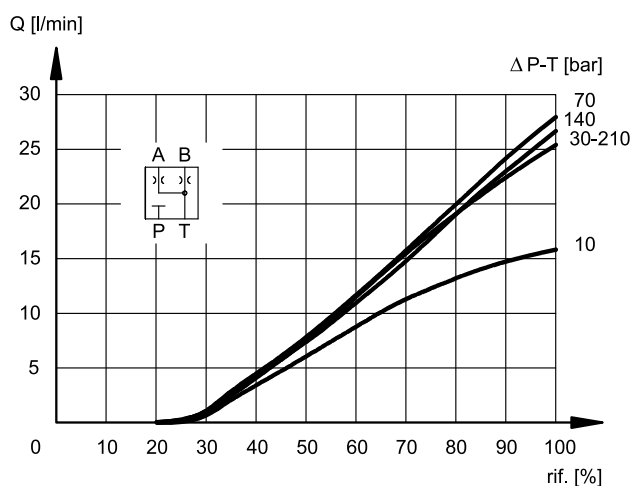




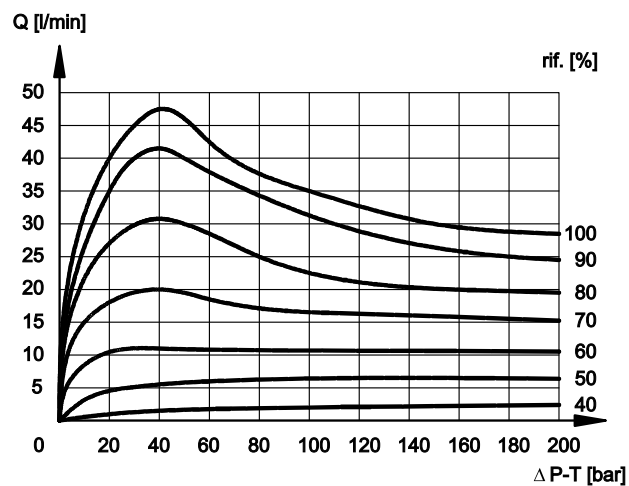
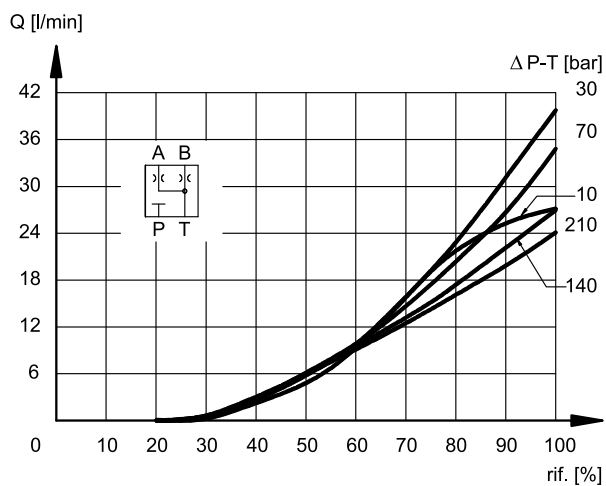
SPOOL TYPE A08



SPOOL TYPE A16

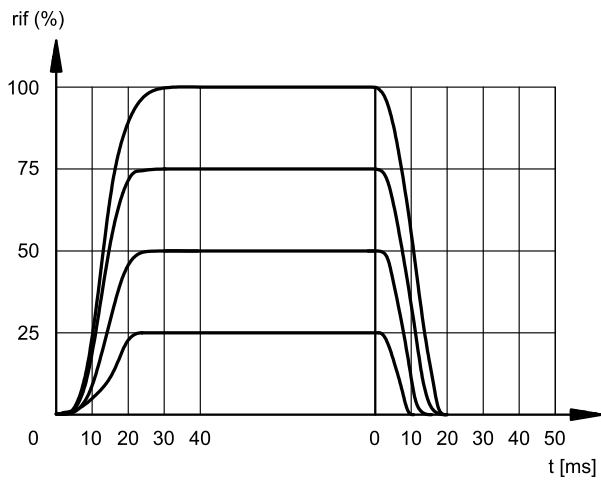


SPOOL TYPE A26



7 - RESPONSE TIMES

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

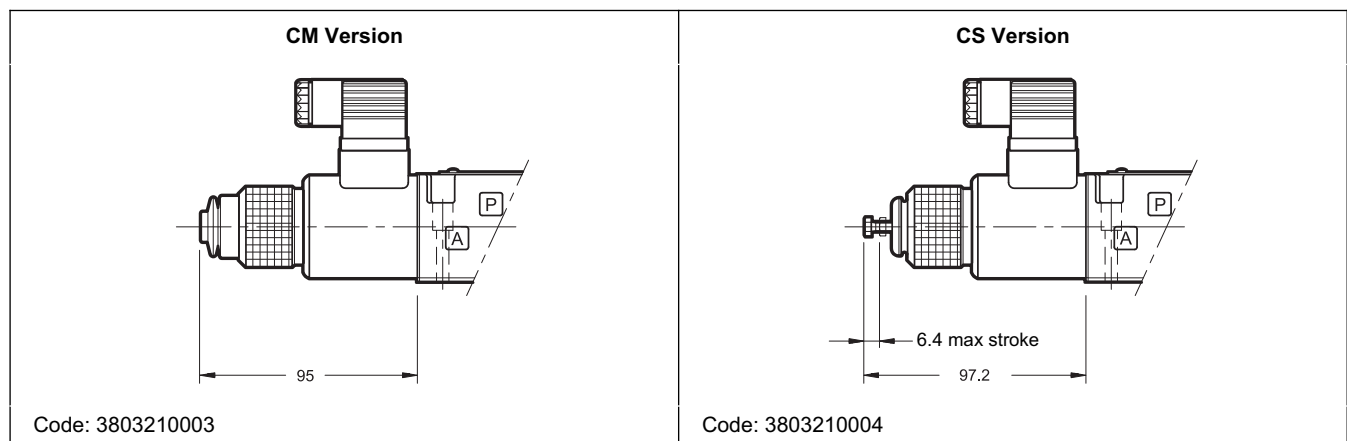


8 - MANUAL OVERRIDE

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

Two versions are available upon request:

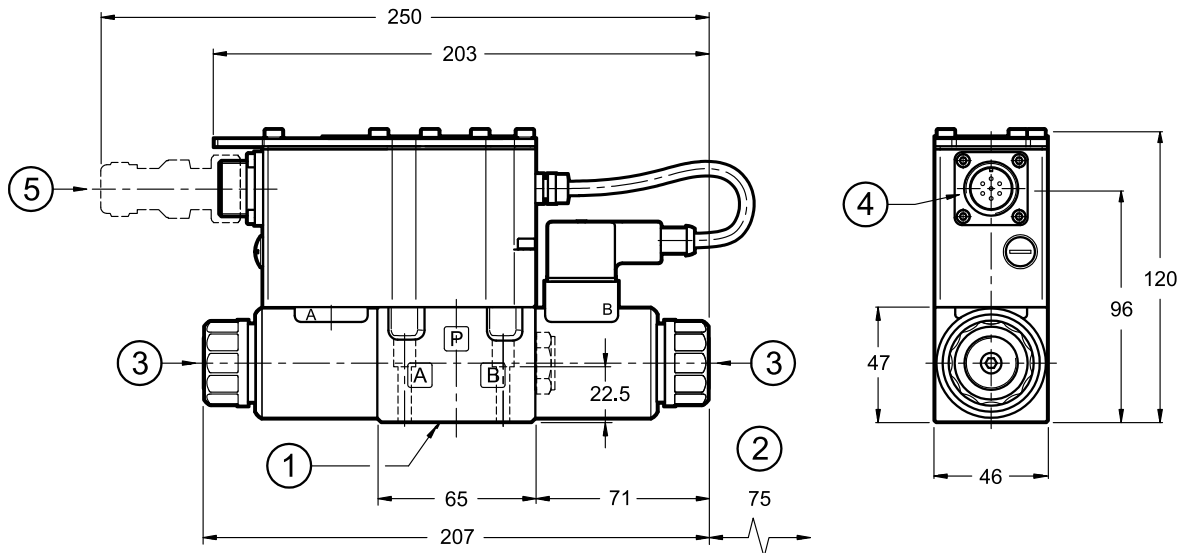
- **CM** version, manual override boot protected.
- **CS** version, with metal locking ring provided with an M4 screw and lock nut to allow the continuous and adjustable mechanical operation.



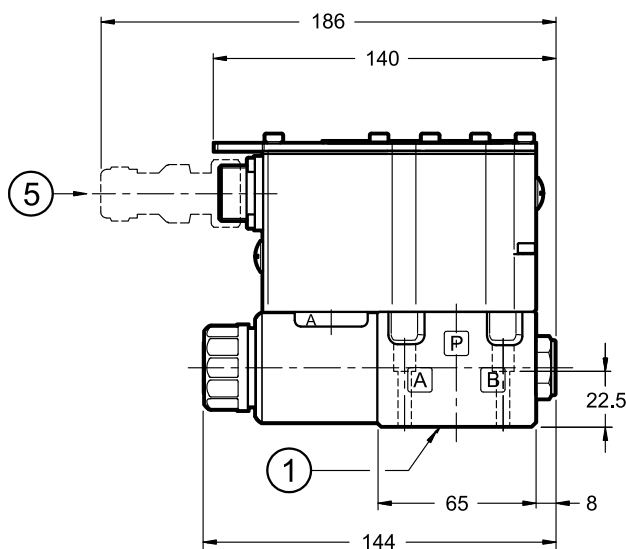
9 - OVERALL AND MOUNTING DIMENSIONS

DSE3G-A*
DSE3G-C*
DSE3G-CZ*

dimensions in mm



DSE3G-A* SA
DSE3G-C* SA



Fastening bolts: 4 bolts M5x30 - ISO 4762

Torque: 5 Nm (A8.8)

Threads of mounting holes: M5x10

1	Mounting surface with sealing rings: N. 4 OR type 2037 (9.25x1.78) 90 Shore
2	Coil removal space (solenoid B only)
3	Standard manual override embedded in the solenoid tube
4	Main connection
5	Mating connector. To be ordered separately. See paragraph 12



10 - 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.

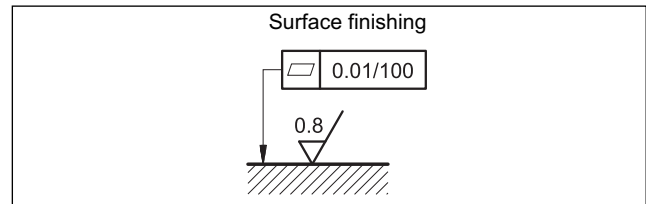
The fluid must be preserved in its physical and chemical characteristics.

11 - INSTALLATION

DSE3G 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.



12 - ACCESSORIES

(to be ordered separately)

12.1 - Mating connector

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

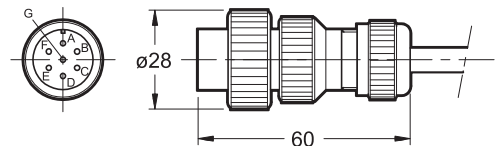


So as to avoid electromagnetic troubles and comply with the electromagnetic compatibility regulation EMC, it is recommended the use of a metal connector.

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**



12.2 - 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.

12.3 - Kit for start-up LINPC-USB

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

13 - SUBPLATES

(see catalogue 51 000)

PMMD-AI3G rear ports
PMMD-AL3G side ports
Ports dimensions: P, T, A, B: 3/8" BSP

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