

# DSE3J

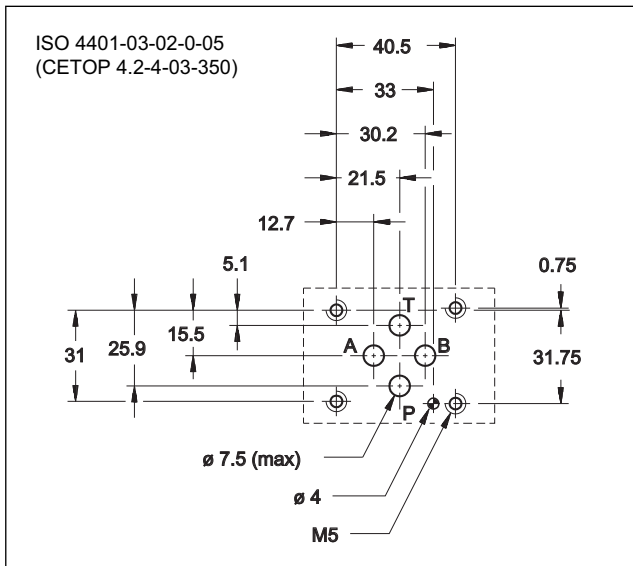
## DIRECTIONAL VALVE WITH PROPORTIONAL CONTROL FEEDBACK AND INTEGRATED ELECTRONICS

### SERIES 31

#### SUBPLATE MOUNTING ISO 4401-03

**p** max 350 bar  
**Q** max 80 l/min

#### MOUNTING INTERFACE

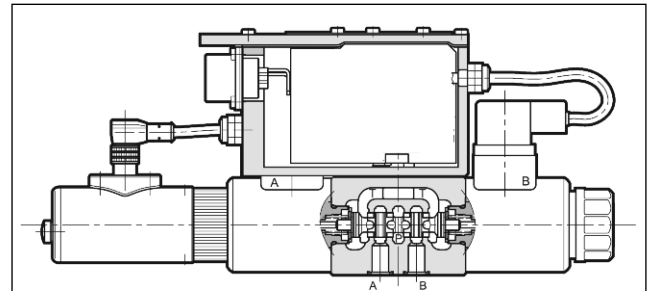


#### PERFORMANCES

(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 $\Delta p$ 10 bar P-T	l/min	1 - 4 - 12 - 30
Response times	see paragraph 7	
Hysteresis	% of Q max	< 0,2%
Repeatability	% of Q max	< 0,2%
Threshold		< 0,1%
Valve reproducibility		≤ 5%
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	2,2 2,7

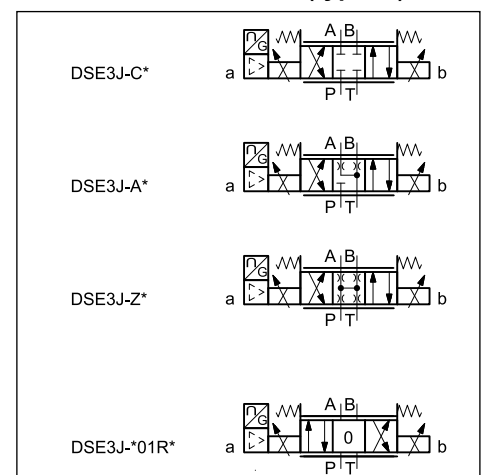
#### OPERATING PRINCIPLE



- The DSE3J is a direct operated directional valve with integrated electric proportional control, feedback and mounting interface in compliance with ISO 4401 standards.
- The valve opening and hence flow rate can be modulated continuously in proportion to the reference signal. Transducer and digital card allow a fine control of the positioning of the cursor, reducing hysteresis and response time and optimizing the performance of the valve.
- It is available with fail safe function (spools type Z).

— The valve is easy to install. The driver manages digital settings directly. It's possible to customize the settings for special applications using the optional kit (see at par. 11).

#### HYDRAULIC SYMBOLS (typical)



## 1 - IDENTIFICATION CODE

D	S	E	3	J	-				/	31	-		K11	
---	---	---	---	---	---	--	--	--	---	----	---	--	-----	--

Direct operated directional control valve

Electric proportional control

Size ISO 4401-03

Digital integrated electronics for valves with feedback

Spool type: \_\_\_\_\_  
**C** = closed centres  
**A** = open centres  
**Z** = zero overlap

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

**FS** = Fail safe option. (omit if not required). Available on spool Z04, Z12 and Z30 only.

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

Main connector 6 pin + PE

Reference signal:  
**E0** = voltage  $\pm 10$  V  
**E1** = current  $4 \pm 20$  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)

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

## 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
<b>04</b>	4 l/min (available for spools Z only)
<b>12</b>	12 l/min
<b>30</b>	30 l/min
<b>30/15</b>	30 (P-A) / 15 (P-B) l/min

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

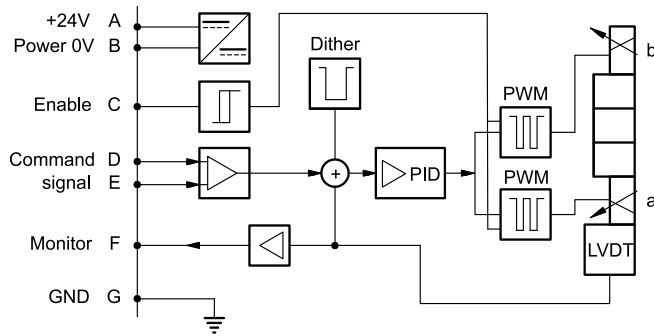
## 3 - ELECTRICAL CHARACTERISTICS

### 3.1 - Electrical on board electronics

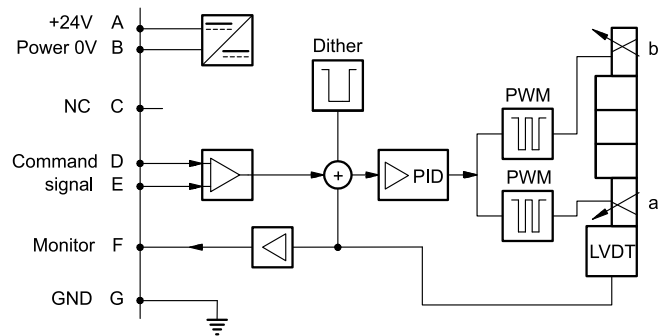
Duty cycle		100% (continuous operation)
Protection class according to EN 60529		IP65 / IP67
Supply voltage	V DC	24 (from 19 to 30 VDC), ripple max 3 Vpp
Power consumption	VA	25
Maximum solenoid current	A	1.88
Fuse protection, external		3A
Command signals:	voltage (E0) current (E1)	V DC mA
		±10 (Impedance Ri > 11 kOhm) 4 ÷ 20 (Impedance Ri = 58 Ohm)
Monitor signals:	voltage (E0) current (E1)	V DC mA
		±10 (Impedance Ro > 1 kOhm) 4 ÷ 20 (Impedance Ro = 500 Ohm)
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)		
emissions	EN 61000-6-4	
immunity	EN 61000-6-2	
		According to 2014/30/EU standards

### 3.2 - On-board electronics diagrams

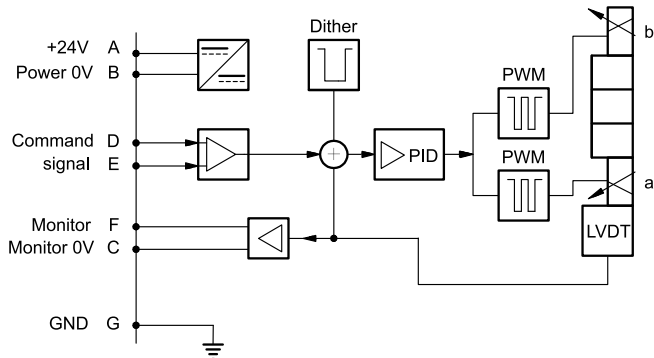
**VERSION A - External Enable**



**VERSION B - Internal Enable**

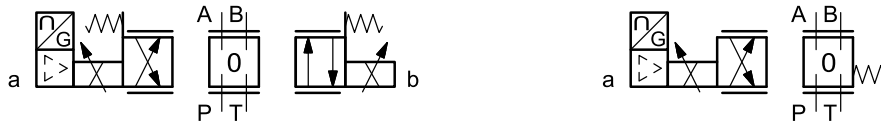


**VERSION C - 0V Monitor**



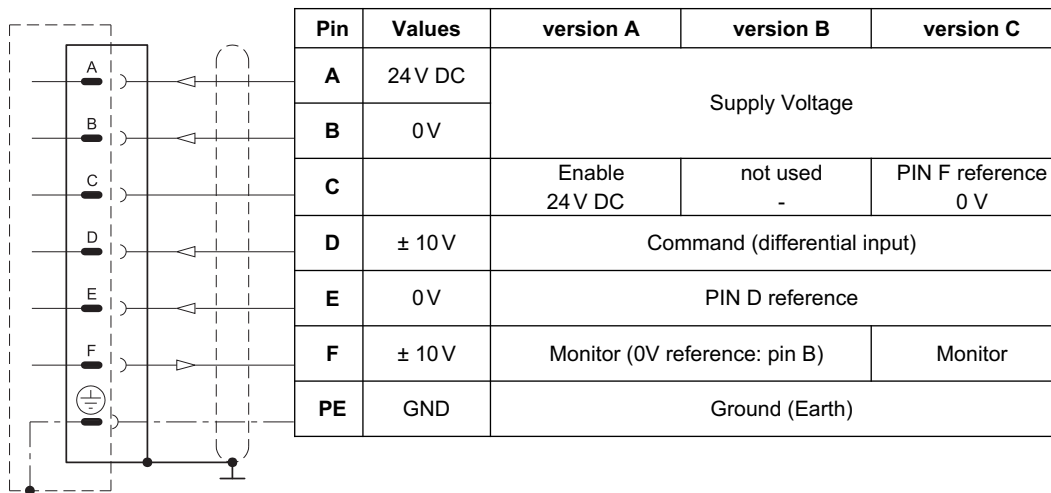
## 4 - VERSIONS WITH VOLTAGE COMMAND (E0)

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.



<b>COMMAND</b>	-10V	0V	+10V
<b>MONITOR</b>	-10V	0V	+10V

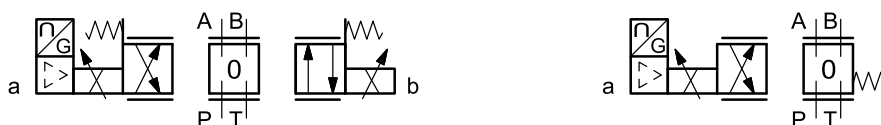
<b>COMMAND</b>	+10V	0V
<b>MONITOR</b>	+10V	0V



## 5 - VERSIONS WITH CURRENT COMMAND (E1)

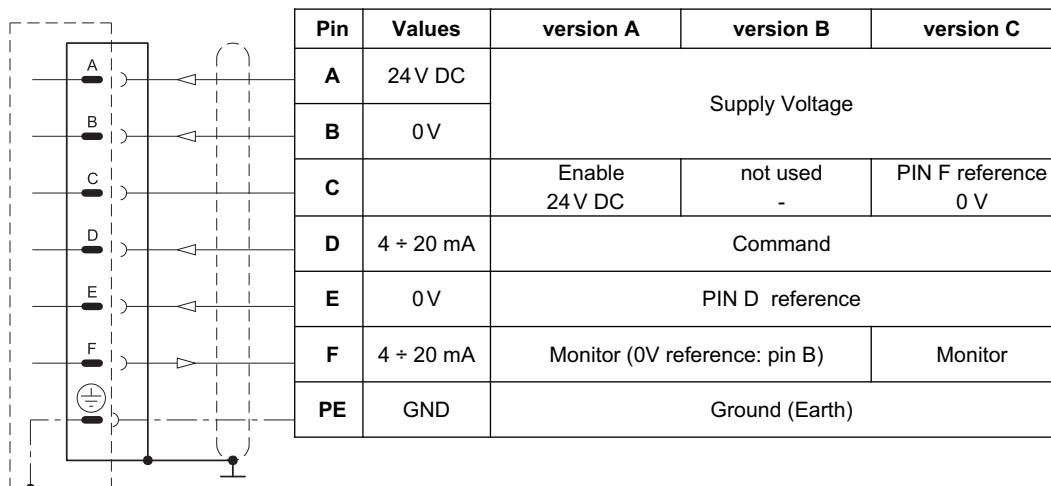
The reference signal is supplied in current 4 + 20 mA. If the current for command is lower, the card shows a breakdown cable error. To reset the error is sufficient to restore the signal.

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



<b>COMMAND</b>	4 mA	12 mA	20 mA
<b>MONITOR</b>	4 mA	12 mA	20 mA

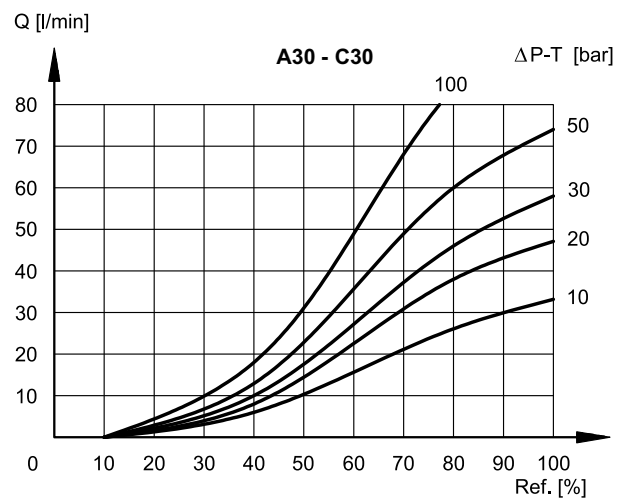
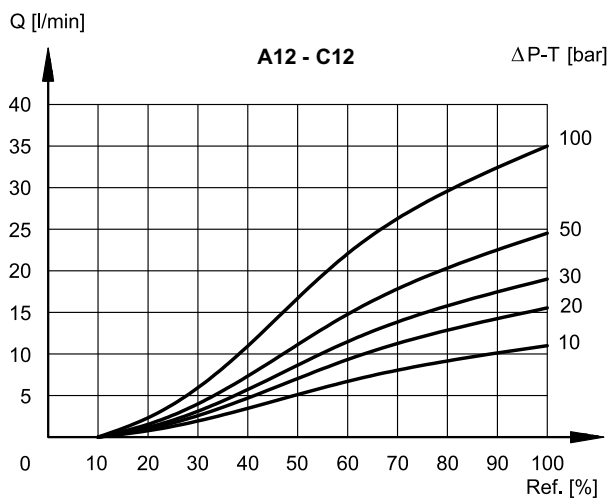
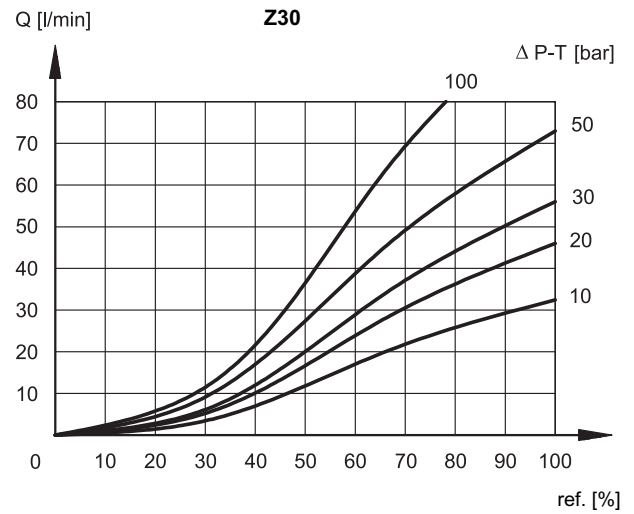
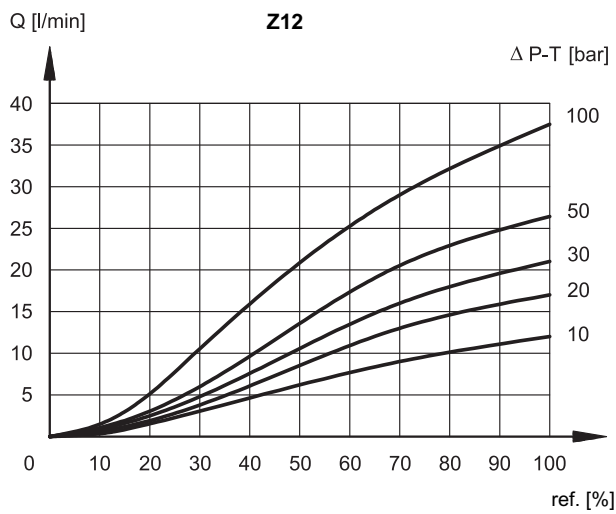
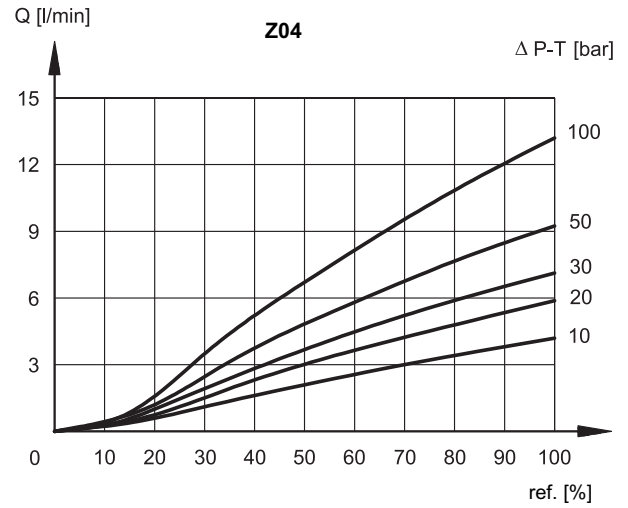
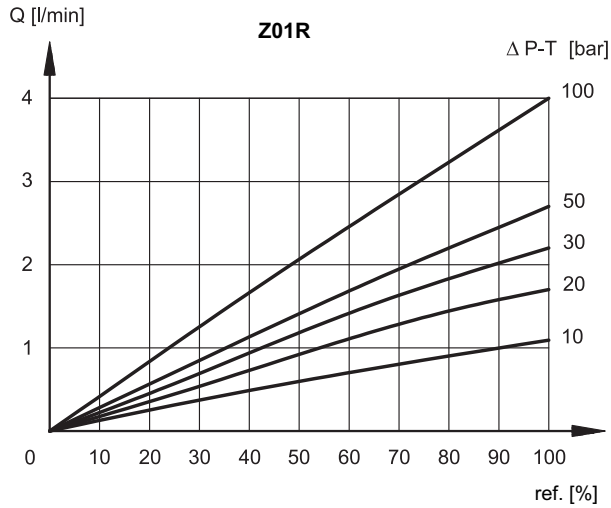
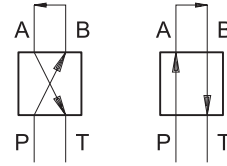
<b>COMMAND</b>	20 mA	4 mA
<b>MONITOR</b>	20 mA	4 mA



### 6 - CHARACTERISTIC CURVES

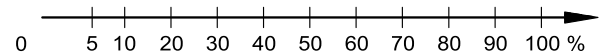
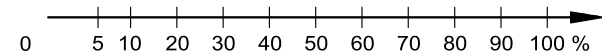
(obtained with mineral oil with viscosity of 36 cSt at 50°C and with digital integrated electronics)

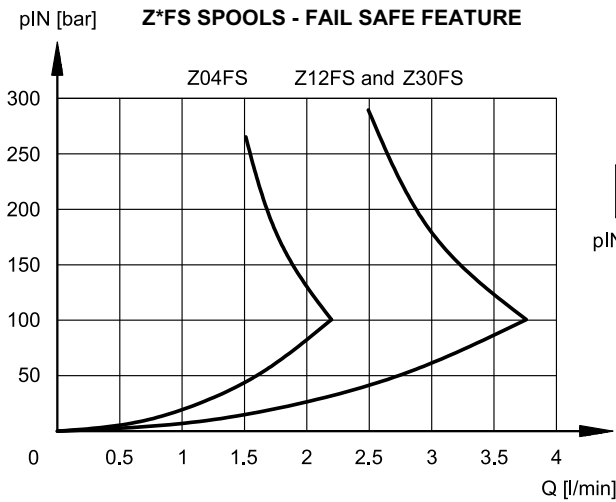
Typical flow rate curves related to the reference signal and measured for the available spools. The  $\Delta p$  values are measured between P and T valve ports.



scale for E0K11C version

scale for E0K11C version





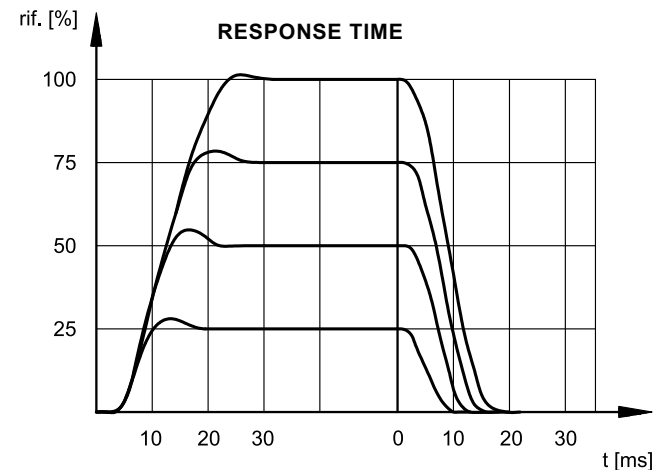
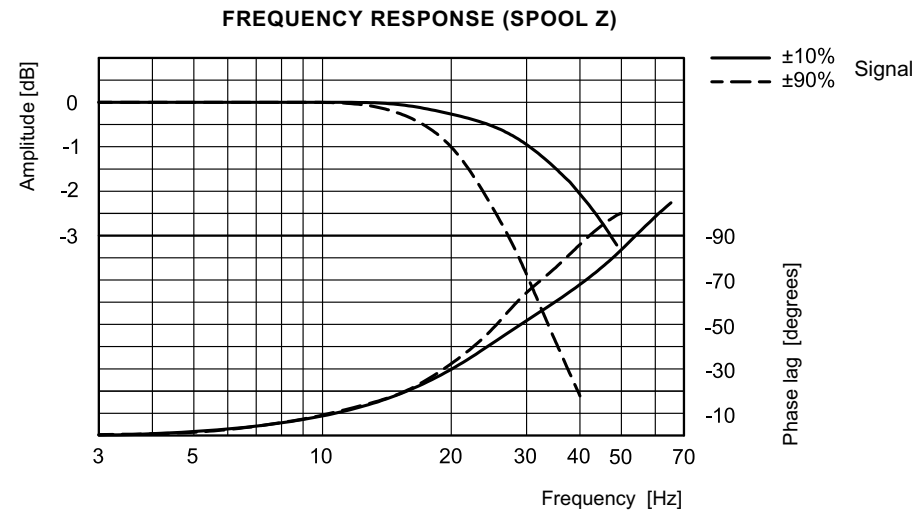
Flow P→B / A→T with valve in fail safe position, depending on the incoming pressure.

When a power failure (enabling OFF) occurs, the valve moves in 'fail safe' position by maintaining a minimum flow that allows the actuator to return slowly to a safety position.

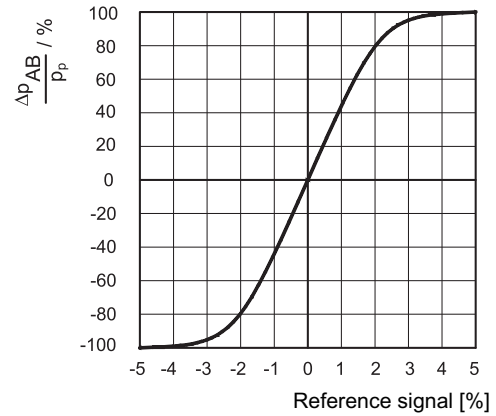
During the black-out the centering springs retain the spool in fail safe-position.

## 7 - RESPONSE TIMES

(obtained with mineral oil with viscosity of 36 cSt at 50°C and 140 bar  $\Delta p$  P→T)



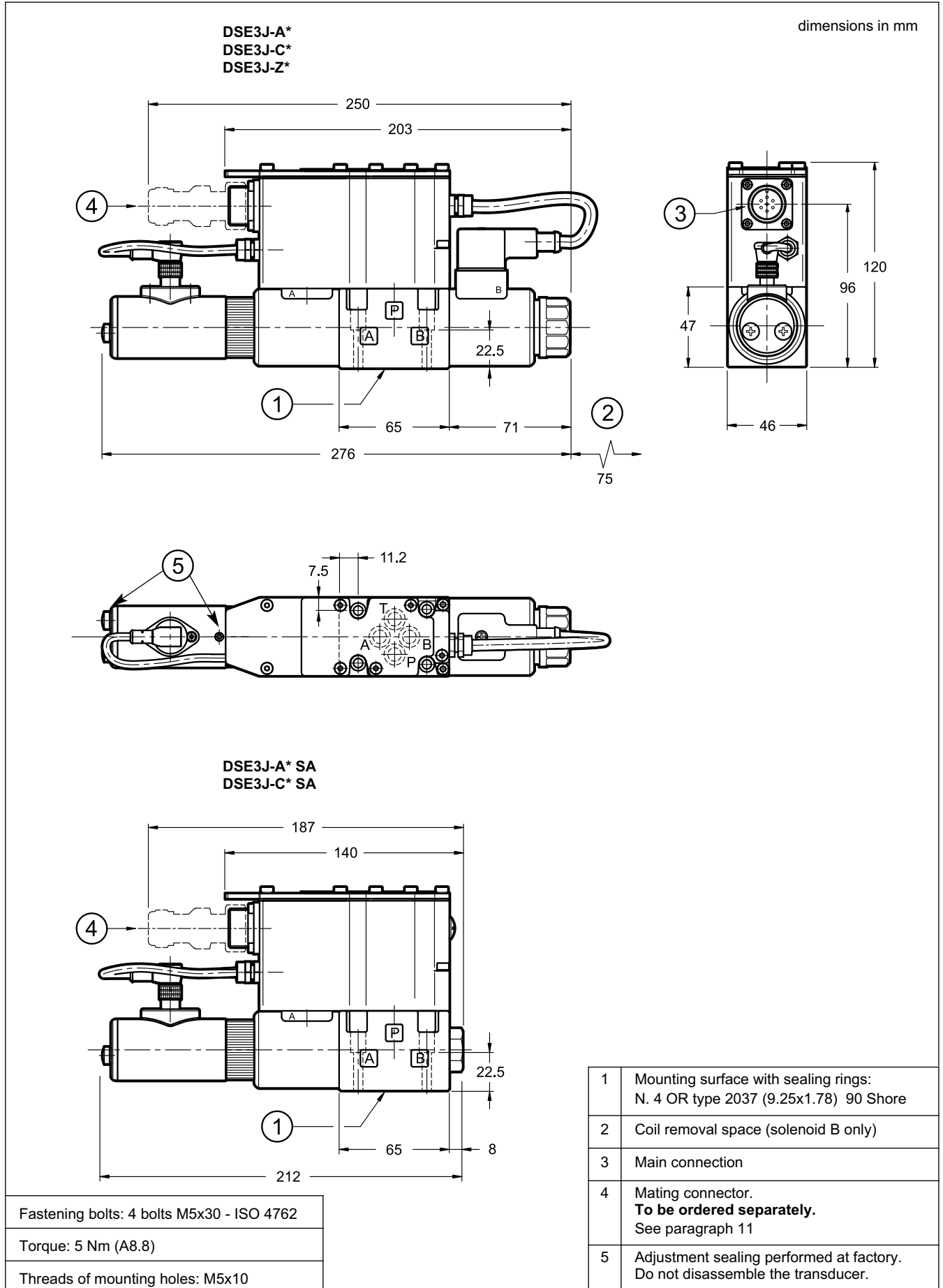
## Z SPOOLS - PRESSURE GAIN



The diagram shows the valve pressure gain, expressed as % of the ratio between the port pressure variation in A or B ( $\Delta p_{AB}$ ) and the P system pressure, according to the reference signal.

In practice, the pressure gain states the valve reaction towards external disturbances aimed at changing the actuator position.

## 8 - OVERALL AND MOUNTING DIMENSIONS





## 9 - 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.

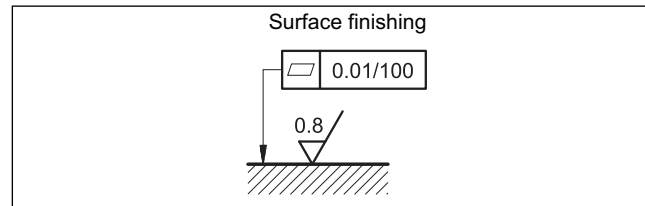
The fluid must be preserved in its physical and chemical characteristics.

## 10 - INSTALLATION

DSE3J 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.



## 11 - ACCESSORIES

(to be ordered separately)

### 11.1 - 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**

### 11.2 - Connection cables size

Power supply:

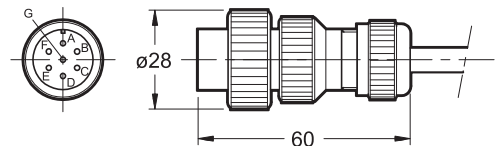
- up to 20 m cable length : 1,0 mm<sup>2</sup>
- up to 40 m cable length : 1,5 mm<sup>2</sup>

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.

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

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



## 12 - SUBPLATES

(see catalogue 51 000)

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