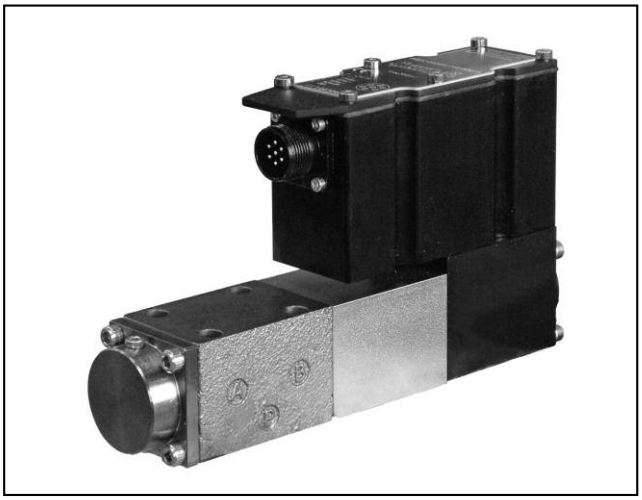


DXE3J

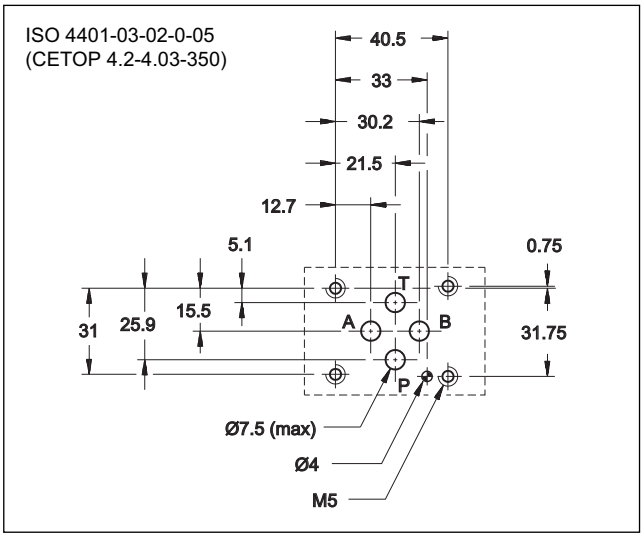
HIGH RESPONSE SERVO-PROPORTIONAL VALVE WITH FEEDBACK AND INTEGRATED ELECTRONICS

SERIES 31

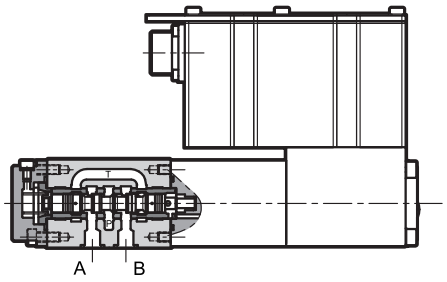
SUBPLATE MOUNTING ISO 4401-03

p max **350** bar
Q max **70** l/min

MOUNTING INTERFACE



OPERATING PRINCIPLE



— The DXE3J valve is a four-way (3 + fail-safe position) servo-proportional valve where the spool moves inside a sleeve. It is operated by a proportional solenoid highly dynamic, which achieves high performance and not requires pilot pressure. The spool position is controlled by a linear transducer (LVDT) in closed loop which ensures high precision and repeatability.

— It is available in six different flow ranges up to 40 l/min, with spools with zero overlap.

— The valve is featured by integral electronic based on SMD technology which ensures standard regulations and simplifies the electric wiring. The unit does not require any adjustment other than the possible electronic regulation of the zero.

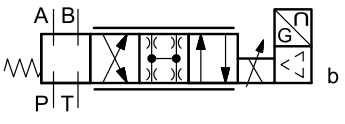
— Suitable for control applications with closed loop of position, velocity and pressure. With a power down or without the enable input, the spool moves automatically at fail-safe position.

PERFORMANCES

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

Maximum operating pressure Ports P - A - B Port T	bar	 350 250
Rated flow Q nom (with Δp 70 bar P - T)	l/min	1 - 2 - 5 - 10 - 20 - 40
Hysteresis	% In	< 0,2
Threshold	% In	< 0,1
Thermal drift (with ΔT= 40 °C)	% In	< 1,0
Response time (0-100%)	ms	≤ 10
Vibration on the three axes	g	30
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	5 ÷ 400
Fluid contamination degree	according to ISO 4406:1999 class 17/15/12 (16/14/11 for longer life)	
Recommended viscosity	cSt	25
Mass	kg	2,6

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

D	X	E	3	J	-	LZ			/	31		-		K11	

Servo-proportional valve with spool in sleeve

Electric proportional control

Size ISO 4401-03

On-board electronic and position feedback

Spools with linear flowrate curve
LZ = zero overlap for low leakage (**standard**)

Rated flow (with Δp = 70 bar P - T)
01 = 1 l/min **10** = 10 l/min
02 = 2 l/min **20** = 20 l/min
05 = 5 l/min **40** = 40 l/min

Fail safe type
F1 = closed centre
F3 = float
FC = cross centre

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

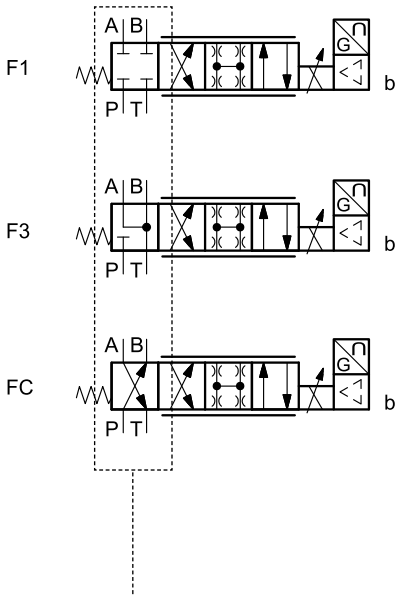
Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

Command value:
E0 = voltage ±10 V
E1 = current 4 ÷ 20 mA

6 + PE pole connector

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

2 - SPOOLS



leakage flow in fail safe position at 100 bar [cm³/min]		
F1	P → A	20
	P → B	30
	A → T	30
	B → T	30
F3	P → A	20
	P → B	30

flow rate	fail safe type		
	F1	F3	FC
01	■	-	-
02	■	-	-
05	■	■	-
10	■	■	-
20	■	■	■
40	■	■	■

■ available - not available

FAIL SAFE POSITION

When a power failure occurs, the electronics de/energize the solenoid and the spool will take the fail safe position by spring return.

3 - 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.

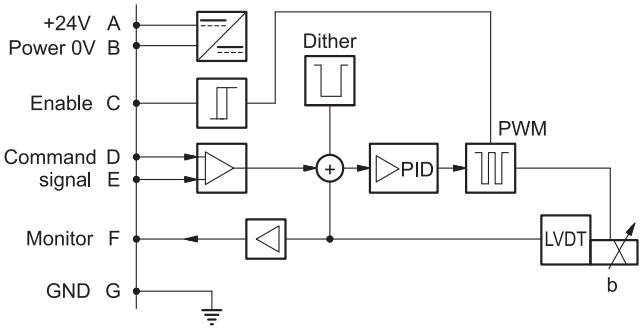
4 - ELECTRICAL CHARACTERISTICS

4.1 - Electrical on board electronics

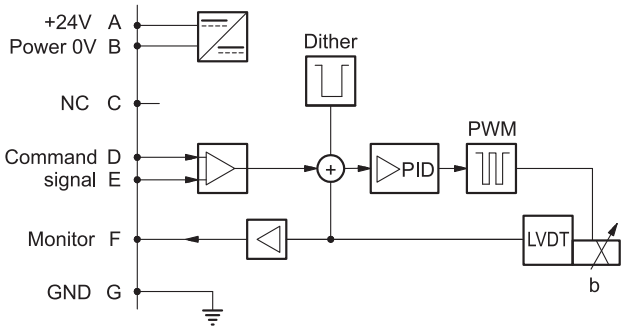
Duty cycle			100% (continuous operation)
Protection class according to EN 60529			IP65 / IP67
Supply voltage		V DC	24 (from 19 to 35 VDC), ripple max 3 Vpp
Power consumption		VA	35
Maximum solenoid current		A	2.6
Fuse protection, external			(fast), max current 4A
Command signals:	voltage (E0) current (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)			According to 2014/30/EU standards (testing accordingly: IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8)

4.2 - On-board electronics diagrams

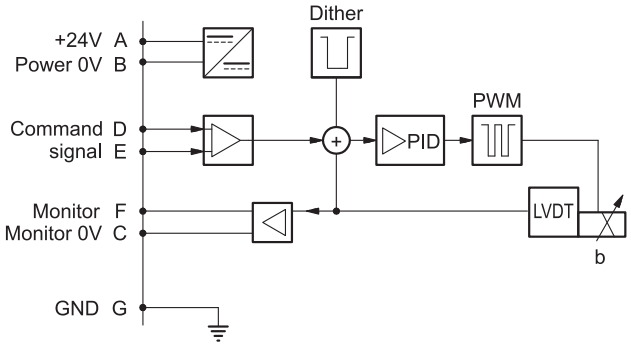
VERSION A - External Enable



VERSION B - Internal Enable

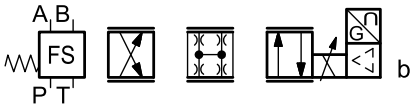


VERSION C - 0V Monitor

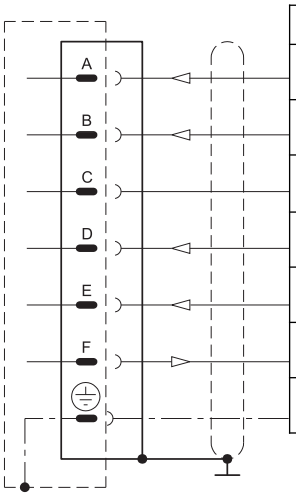


5 - VERSIONS WITH VOLTAGE COMMAND (E0)

The reference signal must be between -10V and +10V. The monitor feature of versions B anc C becomes available with a delay of 0,5 sec from the power-on of the card.



COMMAND	**-10V**	**0V**	**+10V**
MONITOR	**-10V**	**0V**	**+10V**

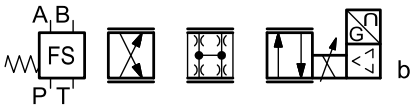


Pin	Values	version A	version B	version C
A	24 V DC	Supply Voltage		
B	0 V			
C		Enable 24 V DC	not used -	PIN F reference 0 V
D	± 10 V	Command (differential input)		
E	0 V	PIN D reference		
F	± 10 V	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (Earth)		

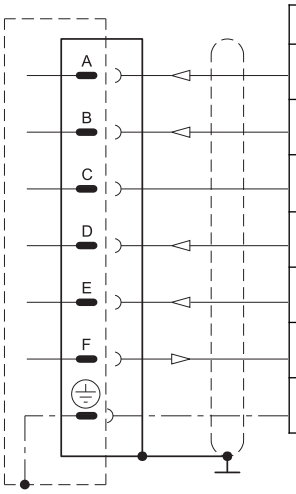
6 - VERSIONS WITH CURRENT COMMAND (E1)

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 anc C becomes available with a delay of 0,5 sec from the power-on of the card.



COMMAND	**4 mA**	**12 mA**	**20 mA**
MONITOR	**4 mA**	**12 mA**	**20 mA**

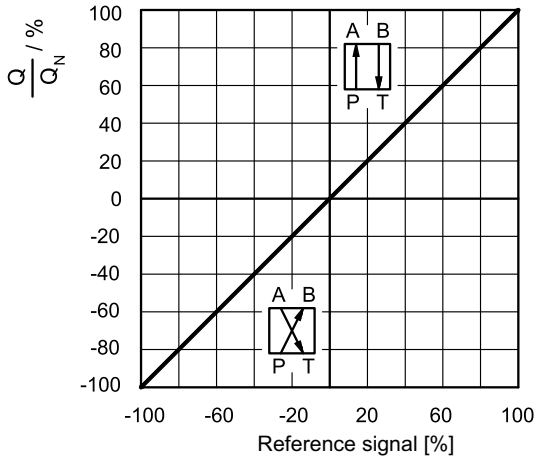


Pin	Values	version A	version B	version C
A	24 V DC	Supply Voltage		
B	0 V			
C		Enable 24 V DC	not used -	PIN F reference 0 V
D	4 ÷ 20 mA	Command		
E	0 V	PIN D reference		
F	4 ÷ 20 mA	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (Earth)		

7 - CHARACTERISTIC CURVES

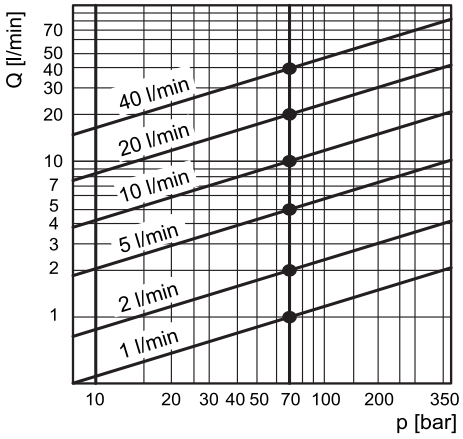
(measured with viscosity of 36 cSt at 50°C)

REFERENCE / FLOW RATE CURVE



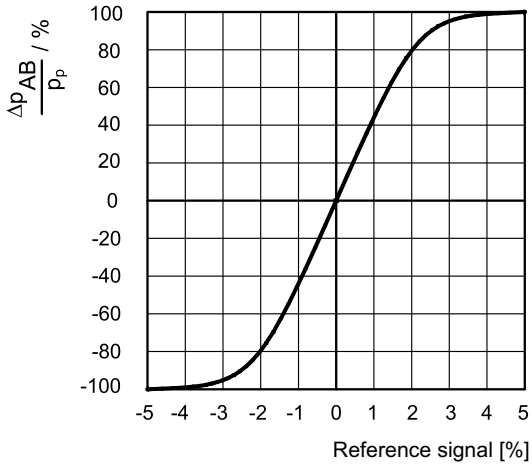
Typical flow rate curves at constant Δp = 70 bar P-T according to the reference signal.
NOTE: with positive reference signal connected to pin D the valve regulates P - A / B - T.

FLOW RATE CURVE ACCORDING TO Δp



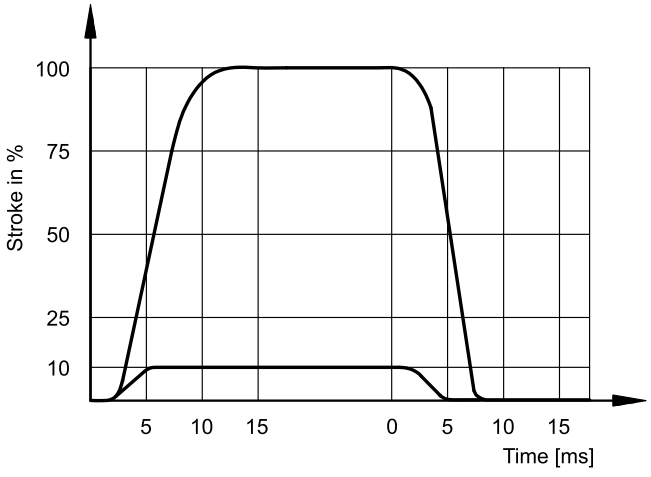
The diagram states the maximum valve controlled flow rate according to the pressure drop between the P and T ports.

PRESSURE GAIN (LZ)

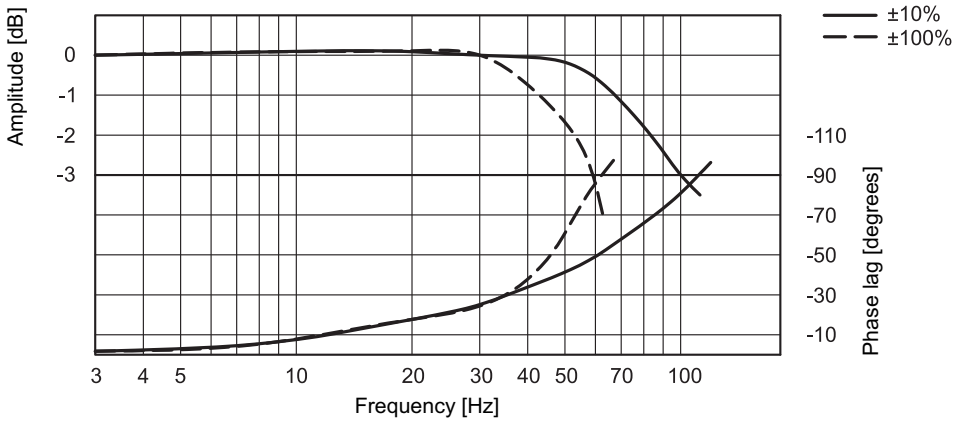


The diagram shows the valve pressure gain, expressed as % of the ratio between the port pressure variation in A or B (Δp AB) and the P system pressure, according to the reference signal. In practice, the pressure gain states the valve reaction towards external disturbances aimed at changing the actuator position.

RESPONSE TIME

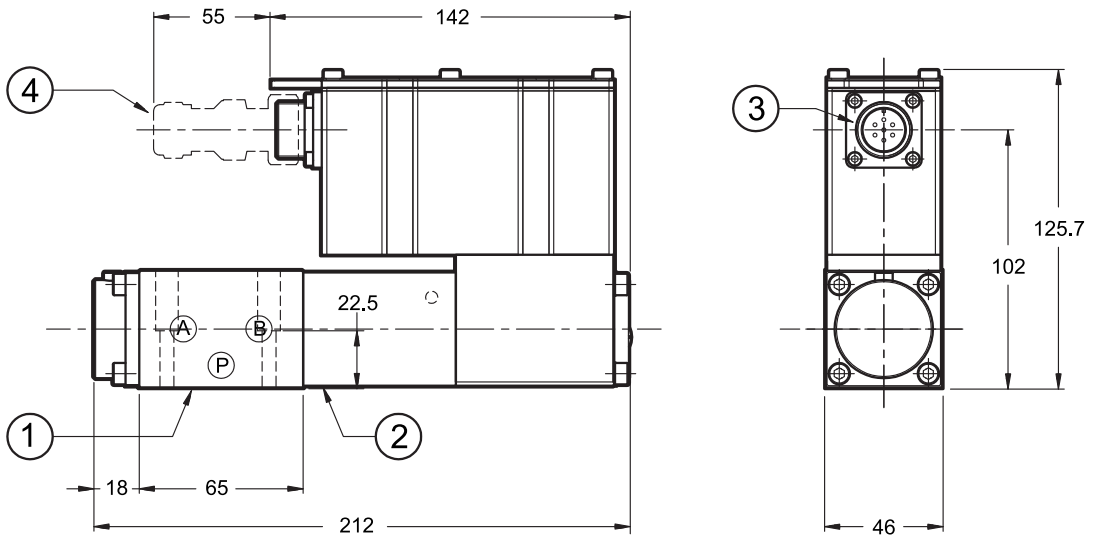


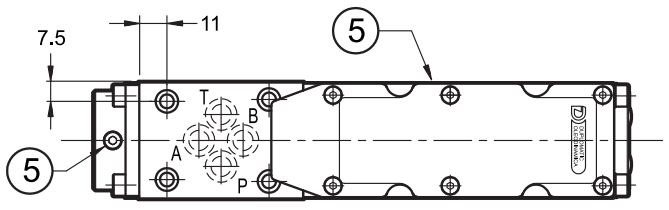
FREQUENCY RESPONSE



8 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm





Fastening bolts: 4 SHC screws M5 x 30
Torque: 5 Nm ± 10% (A8.8)
Threads of mounting holes: M5x10

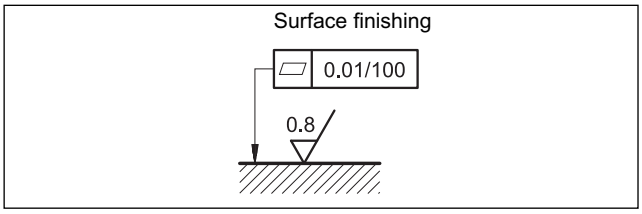
1	Valve body with mounting surface sealing rings: N. 4 OR type 2037 (9.25x1.78) 90 Shore
2	Control solenoid with position transducer
3	Main connection
4	Mating connector. **To be ordered separately.** See paragraph 9
5	Air breather. Allen key: 3 Tightening torque 2.5 Nm

9 - INSTALLATION

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

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 mounting surfaces and surrounding environment upon installation.

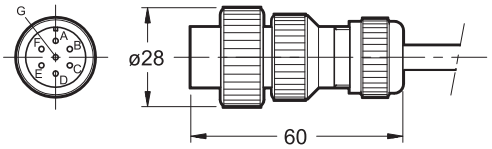


10 - ACCESSORIES

(to be ordered separately)

10.1 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**

10.2 - Connection cables size

Power supply:
- up to 20 m cable length : 1,0 mm^2
- up to 40 m cable length : 1,5 mm^2

Signal: 0,50 mm^2

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

10.3 - Kit for start-up LINPC-USB

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

11 - SUBPLATES

(see catalogue 51 000)

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

DUPLOMATIC
MOTION SOLUTIONS

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