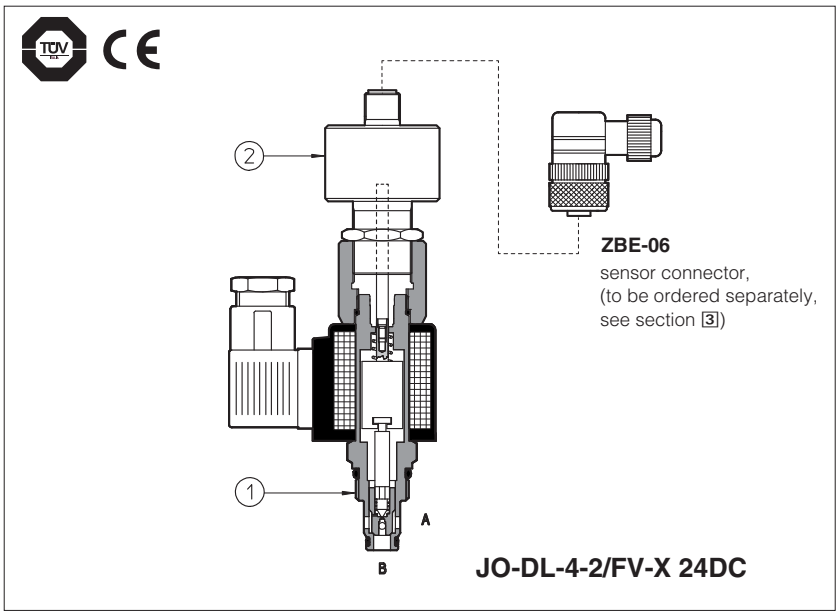
Safety cartridge valves type JODL

2-way, poppet type, leak free, with optional inductive position switch conforming to Machine Directive 2006/42/CE



JO-DL-4-2/FV-X 24DC

Leak free, poppet type solenoid cartridges in screw-in execution are normally used to cut off the hydraulic power supply line. They are available in normally closed NC, or normally open one NO configurations.

The /FV versions integrate an inductive position switch (double contact NC/NO) ② wich supplies the output electrical on-off signal indicating the poppet ① position (open/closed), and therefore they can be used as safety valves for emergency conditions.

They are designed fulfil the safety criteria imposed by the European Machine Directive 2006/42/CE.

Features:

- virtually zero internal leakage;
- limited pressure drops;
- low response times;
- great switching reliability even at high pressures and during long rests;
- CE marked and certified by TÜV for /FV version;

Cavity: **ISO 17209;**
Max flow: **150 l/min;**
Max pressure: **350 bar.**

1 MODEL CODE

JO	-	D	L	-	4	-	2	/	NC	-	X	24 DC	**	/	*

Cartridge valve screw-in type UNF

D = Directional control

L = Poppet type

Size:
4 = 3/4"-16UNF-2B
6 = 7/8"-14UNF-2B
10 = 1 5/16"-12UNF-2B

2 = Two-way

Version:
NC = normally closed in rest position
NO = normally open in rest position
FV = normally closed in rest position, with inductive position switch (double contact)

X = Without connector, see section 3 for available connector

Voltage code:
12DC = 12 VDC
24DC = 24 VDC

Series number

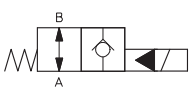
Seals material, see section 4:
- = NBR
PE = FKM
BT = HNBR **(1)**

Note (1): not for version /FV

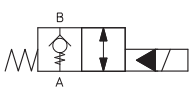
2 HYDRAULIC CHARACTERISTICS

Hydraulic symbols

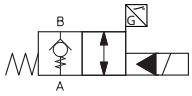
/NO



/NC



/FV



Model			JO-DL-4-2/NC JO-DL-4-2/FV	JO-DL-4-2/NO	JO-DL-6-2/NC JO-DL-6-2/FV	JO-DL-6-2/NO	JO-DL-10-2/NC JO-DL-10-2/FV	JO-DL-10-2/NO
Pressure limits		[bar]	350					
Nominal flow		[l/min]	40		75		150	
Response time:	energizing	[ms]	35	50	30	50	35	150
	de-energizing	[ms]	50	35	60	35	70	35
Internal leakage			less than 5 drops/min (≤ 0,36 cm³/min) max at 350 bar					

3 MAIN CHARACTERISTICS OF VALVES TYPE JODL

Installation position	Any position		
Subplate surface finishing	Roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101)		
MTTFd values according to EN ISO 13849	150 years, for further details see technical table P007		
Ambient temperature	Standard execution = -30°C ÷ +70°C /PE option = -20°C ÷ +70°C /BT option = -40°C ÷ +70°C		
Seals, recommended fluid temperature	NBR seals (standard) = -20°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C HNBR seals (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C		
Recommended viscosity	15÷100 mm²/s - max allowed range 2.8 ÷ 500 mm²/s		
Fluid contamination class	ISO 4406 class 21/19/16 NAS 1638 class 10, in line filters of 25 μm (β10 ≥75 recommended)		
Hydraulic fluid	**Suitable seals type**	**Classification**	**Ref. Standard**
Mineral oils	NBR, FKM	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR	HFC	
Flow direction	As shown in the symbols of table 2		
Operating pressure	Ports A, B: **350 bar**		
Rated flow	See diagrams Q/Δp at section 7		
Maximum flow	**40** l/min for JO-DL-4; **75** l/min for JO-DL-6, **150** l/min for JO-DL-10		
Relative duty factor	100%		
Supply voltage	See model code at section 1		
Supply voltage tolerance	±10%		
Max power	19 Watt		
Power connector	666 (plastic - black); 3 pins, cable clamp PG11, cable max ø 11 mm		**to be ordered separately**
Type of connector for /FV version	Type ZBE-06 (plastic); 4 pins, cable clamp PG9, cable max ø 8 mm		
Connectors features	666: DIN 43650 - ISO 4400; IP65 (DIN 40050); VDE 0110C		
	ZBE-06: M12 - IEC60947-5-2; IP67 (DIN 40050)		

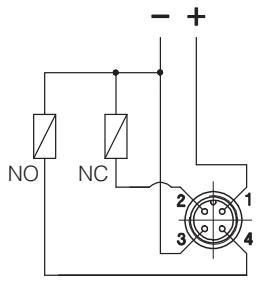
4 INSTALLATION NOTES

1) The assembling of cartridges inside manifolds must be done tightening the valve exagonal ring (for tightening torque, see section 8).
   Excessive values can cause anomalous deformation and poppet sticking.
   For the /FV versions avoid to tighten through the position sensor.
2) The CE certification is valid only with shielded electric cables and connector. Consult also tab. P004.
   These safety valves must be supplied only and always as one complete component, proximity sensor is factory adjusted.
   The supply of subcomponents invalidates the certification.

5 TECHNICAL CHARACTERISTICS AND CONNECTING SCHEME OF INDUCTIVE POSITION SWITCH /FV

Type of switch		position switch **/FV**
Supply voltage	[V]	20÷32
Ripple max	[%]	≤ 10
Max current	[mA]	400
Power consumption	[mA]	-
Voltage drop	[V]	-
Max switching frequency	[Hz]	-
Max peak pressure	[bar]	400
Mechanical life		virtually infinite
Switch logic		PNP

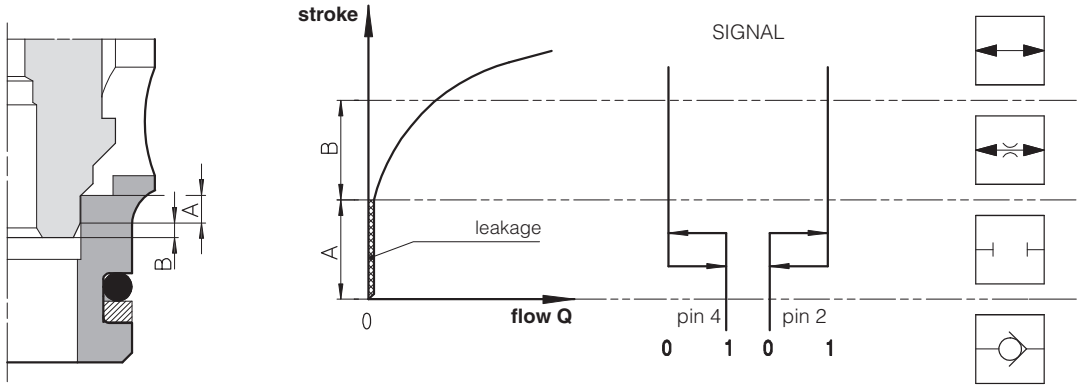
Connector type **ZBE-06**



1 = supply +24 VDC
2 = output signal NC
3 = GND
4 = output signal NO

NOTE: the /FV position switch are not provided with a protective earth connection

6 SIGNAL STATUS - VERSIONS /FV

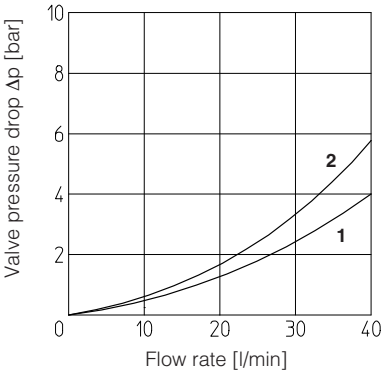


A: overlapping stroke
B: damping stroke

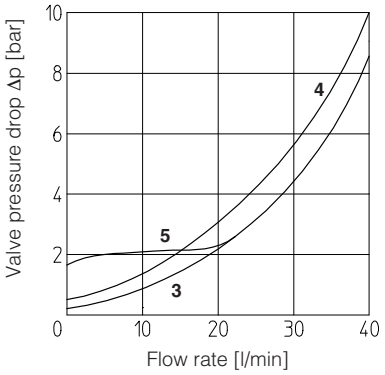
According the criteria of safety specifications, the poppet position signal must change its status inside the overlapping stroke (before the effective valve opening).

7.1 JO-DL-4

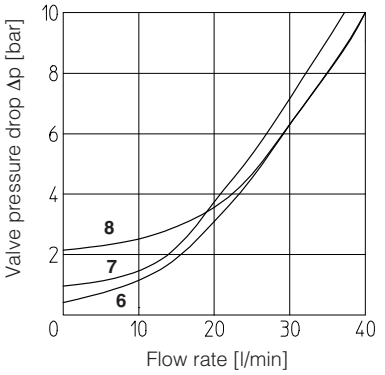
Valve pressure drop - NO version
1= flow B → A
2= flow A → B



Valve pressure drop - NC version
3= flow B → A energized
4= flow A → B
5= flow B → A de-energized

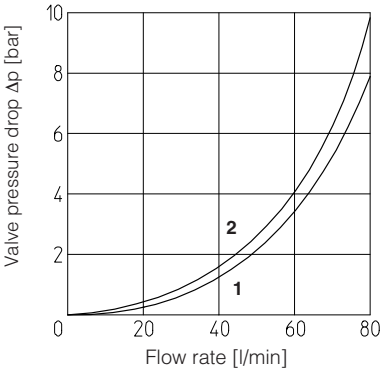


Valve pressure drop - FV version
6= flow B → A energized
7= flow A → B
8= flow B → A de-energized

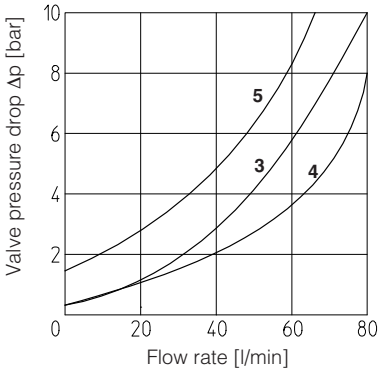


7.2 JO-DL-6

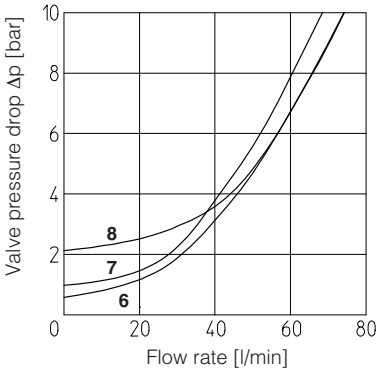
Valve pressure drop - NO version
1= flow B → A
2= flow A → B



Valve pressure drop - NC version
3= flow B → A energized
4= flow A → B
5= flow B → A de-energized

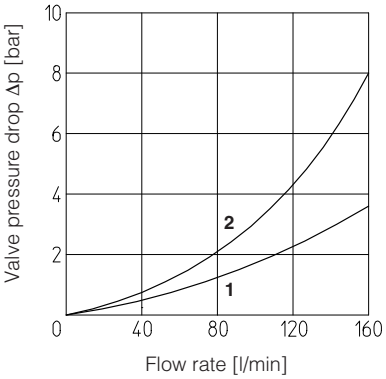


Valve pressure drop - FV version
6= flow B → A energized
7= flow A → B
8= flow B → A de-energized

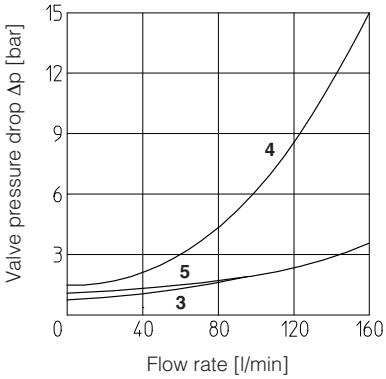


7.3 JO-DL-10

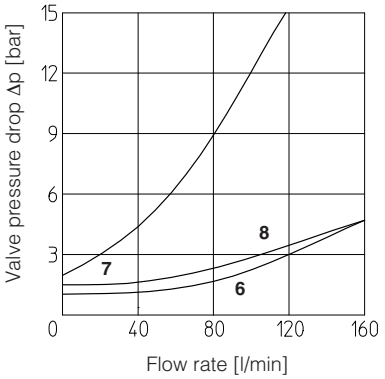
Valve pressure drop - NO version
1= flow B → A
2= flow A → B



Valve pressure drop - NC version
3= flow B → A energized
4= flow A → B
5= flow B → A de-energized

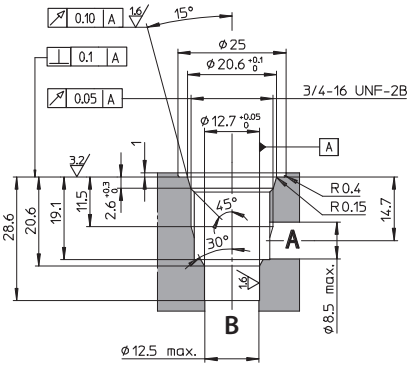


Valve pressure drop - FV version
6= flow B → A energized
7= flow A → B
8= flow B → A de-energized

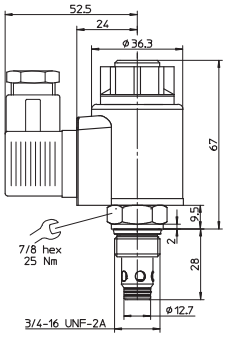


8 DIMENSIONS [mm]

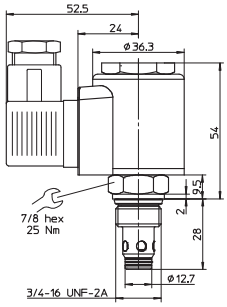
JO-DL-4



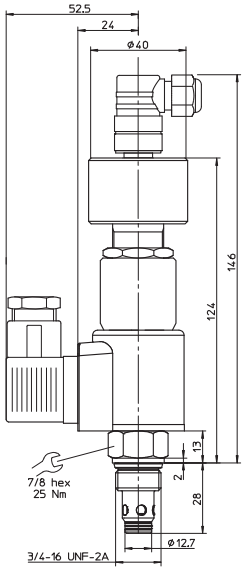
Version /NO



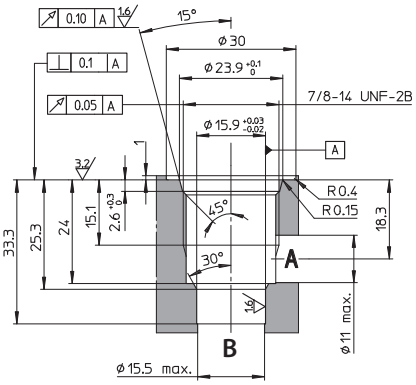
Version /NC



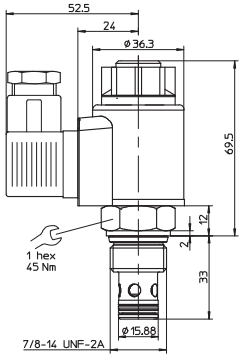
Version /FV



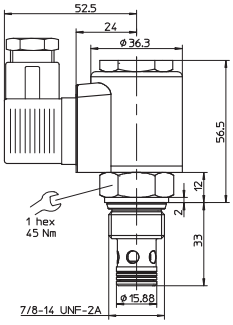
JO-DL-6



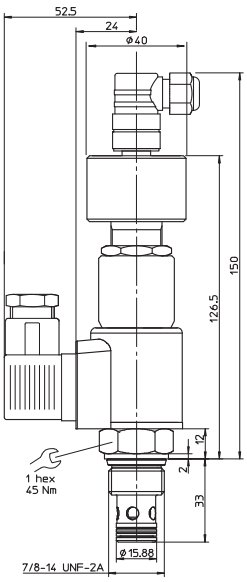
Version /NO



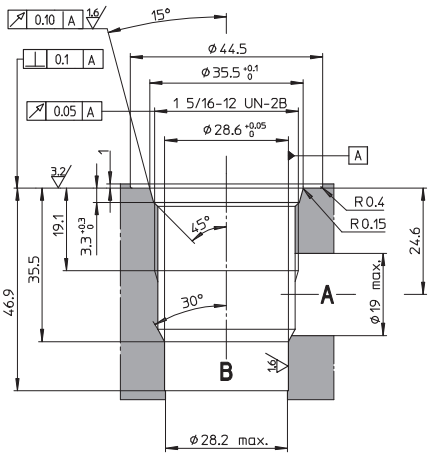
Version /NC



Version /FV



JO-DL-10



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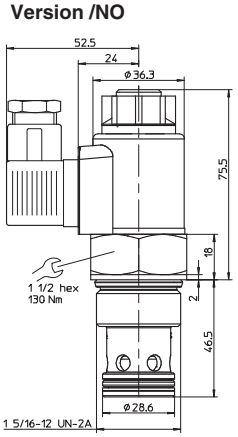
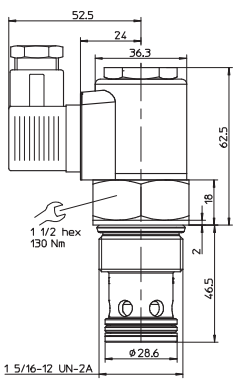


Version /NC



Version /FV