Direct Operated Proportional Relief Valve (with inductive position transducer)

Model: DBETR...1XJ

- Size 6
- Maximum working pressure 350 bar
- Maximum working flow 3 L/min

Contents

Features

- Low hysteresis
- Good repeatability
- Electrical closed loop position control of spring pre-tension
- Both valves and proportional amplifiers from the same supplier

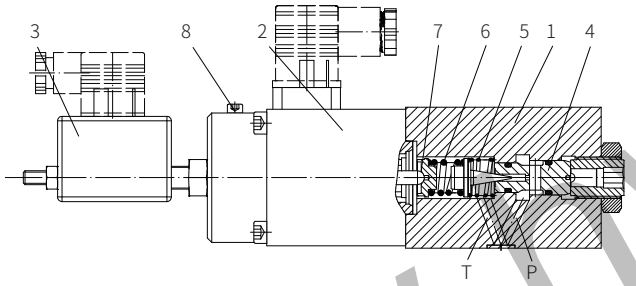
Function description, sectional drawing

The DBETR proportional relief valve is a remote control valve and direct operated pressure relief valve of poppet design. The valve adjusts the pressure in proportion to the electrical command value.
The valve consists of the valve body (1), proportional solenoid (2) with inductive positional transducer (3), valve seat (4) and valve poppet (5). The pressure is set by adjusting the command value potentiometer (0 to 9 V). Adjusting the command value causes tensioning of the compression spring (6) via controlling the electronic element and the proportional solenoid (2). Tensioning of the compression spring (6), i.e. the position of the spring plate (7) is measured by the inductive positional transducer (3). The deviations from the command value are corrected by the closed loop positional control. The use of this principle eliminates the effect of solenoid friction.

Advantages:
- Low hysteresis
- Good repeatability

When the command value of the proportional solenoid is zero or power failure or the cable breakage at the positional transducer, it must be adjusted to the minimum settable pressure.

Note!
In order to ensure optimum valve function of the valve, it should be bled when valve used:
– Remove item 8
– Fill the oil into the open screw hole at item 8
– Re-screw the item 8 when no more bubbles appear
– It must be avoid the emptying running of tank.
In some installation conditions, a back pressure valve is to be installed (back pressure approx. 2 bar).

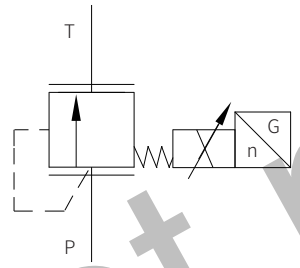


Models and specifications

DBETR - 1X / J / G24 K4 *

- proportional relief valve
- 10 to 19 series (10 to 19 series installation and connection size unchanged) =1X
- Rekith =J
- pressure stage: up to 30 bar =30; up to 80 bar =80; up to 180 bar =180; up to 230 bar =230; up to 315 bar =315; up to 350 bar =350
- Control electronics supply voltage 24V DC =G24
- K4= square socket without plug
- sealing material: No code= NBR seals; V= FKM seals (consult for other seals)
- more information in text

Functional symbols



Technical parameters

Electrical (solenoid)					
Supply voltage		V	24 DC		
Maximum power consumption		VA	50		
Coil resistance	Cold value at 20 °C	Ω	10		
	Maximum warm value	Ω	13.9		
Duty		%	100		
Electrical connections			With component plug to DIN EN 175301-803		
			Plug-in connector to DIN EN 175301-803		
Protection to EN 60529			IP65 with mounted and fixed plug-in connector		
Electrical (inductive position transducer)					
Coil resistance	Total resistance of the coils		1 and 2	2 and ⏚	⏚ and 1
	at 20°C	Ω	31.5	45.5	31.5
Electrical connections			With component plug		
			Plug-in connector with flat seal		
Inductivity		mH	6 to 8		
Oscillator frequency		KHz	2.5		
Protection to EN 60529			IP65 with mounted and fi xed plug-in connector		

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Technical parameters

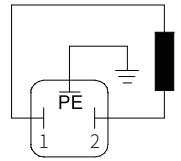
Overview				
Weight		Kg	4.0	
Installation position			Preferably horizontal	
Storage temperature range		°C	-20 to +80	
Environment temperature range		°C	-20 to +50	
Hydraulic (measured when using HLP46, t =40°C ± 5°C)				
Working pressure	Port P	bar	Up to 350	
	Port T, with pressure control	bar	Up to 2	
	Without pressure control, Port T	bar	Up to 100	
Maximum settable pressure	Pressure stage 30	bar	30	
	Pressure stage 80	bar	80	
	Pressure stage 180	bar	180	
	Pressure stage 230	bar	230	
	Pressure stage 315	bar	315	
	Pressure stage 350	bar	350	
Minimum settable pressure			(See p_{min}-q_v-characteristic curves)	
Maximum flow	Pressure stage 30	L/min	3	
	Pressure stage 80	L/min	3	
	Pressure stage 180	L/min	3	
	Pressure stage 230	L/min	3	
	Pressure stage 315	L/min	2	
	Pressure stage 350	L/min	2	
Fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG (Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]	
Fluid temperature range		°C	-20 to +80	
The maximum allowable pollution degree of the oil according to ISO 4406 (c)			Class 20/18/15[1]	
Viscosity range		mm^2/s	15 to 380	
Hysteresis		%	< 1 of max. settable pressure	
Repeatability		%	< 0.5 of max. settable pressure	
Linearity		%	< 1.5 of max. settable pressure	
Typical variation		%	± 3 of max. settable pressure	
Stepped response T_u + T_g (0 to 100 %), dependent on the system			P_{min} — P_{max}	P_{max} — P_{min}
	Pressure stage 30, 80, 180	ms	100	50
	Pressure stage 230, 315, 350	ms	150	100

The oil must meet the cleanliness degree requested by the components in the hydraulic system.
Effective oil filtration can prevent failure and increase the service life of the components

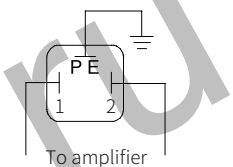
Electrical connections

Proportional solenoid

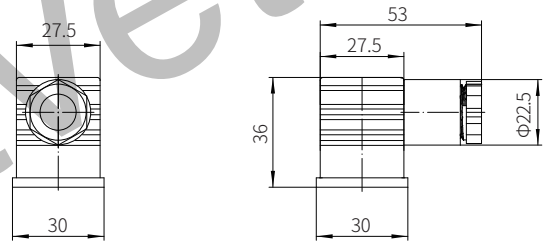
Connection at component plug



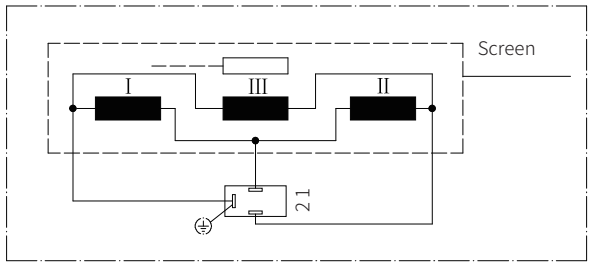
Connection at plug-in connector



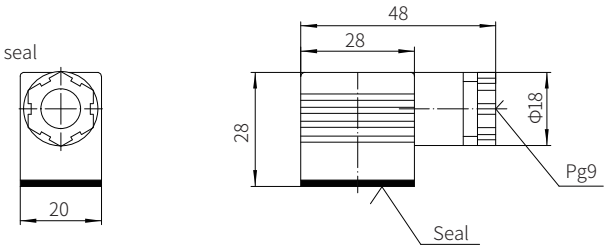
Plug-in connector



Inductive position transducer



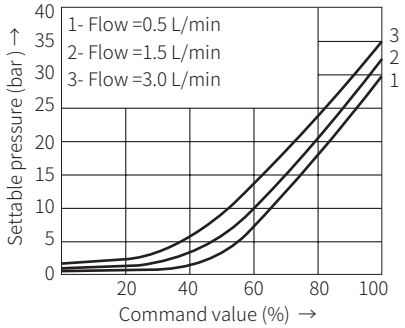
Plug-in connector with flat seal



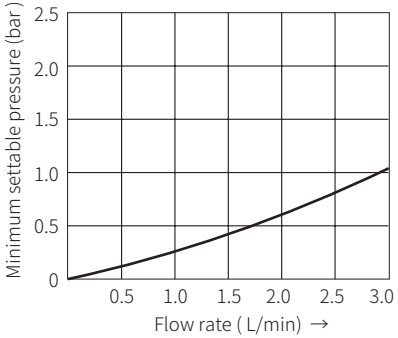
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

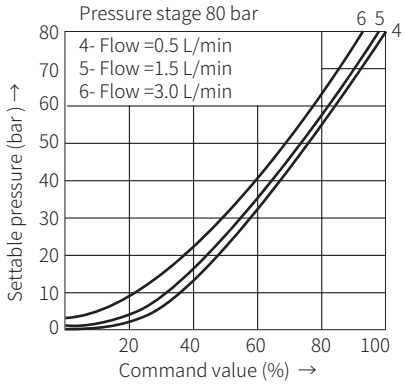
Pressure stage 30 bar



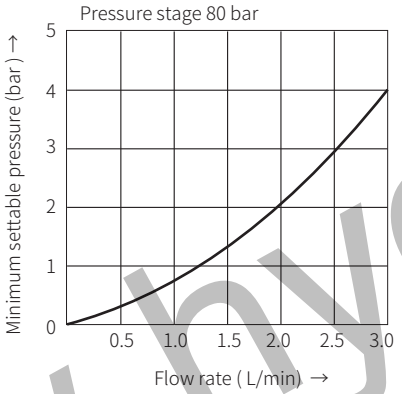
Pressure stage 30 bar



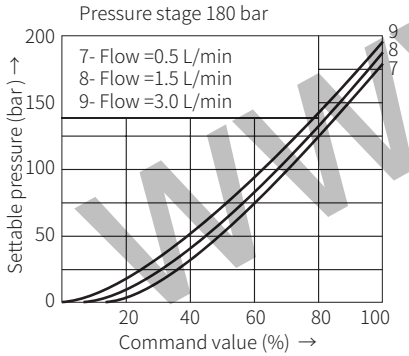
Pressure stage 80 bar



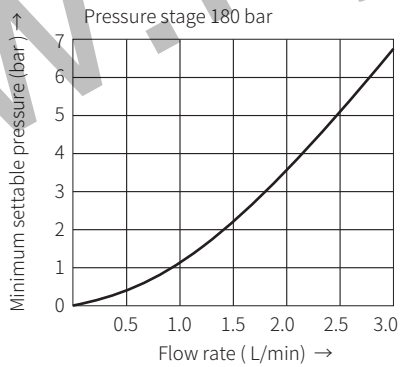
Pressure stage 80 bar



Pressure stage 180 bar



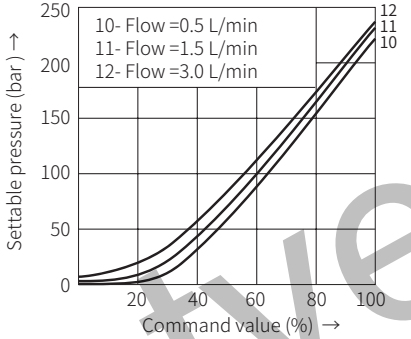
Pressure stage 180 bar



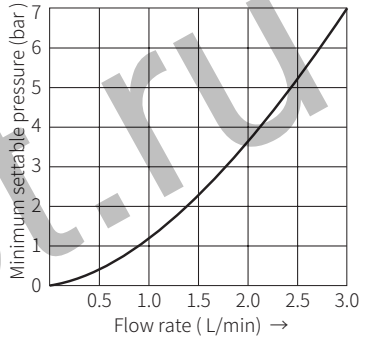
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

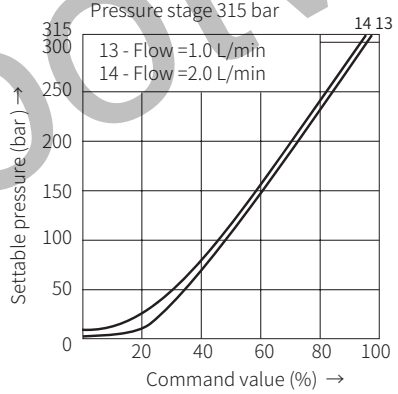
Pressure stage 230 bar



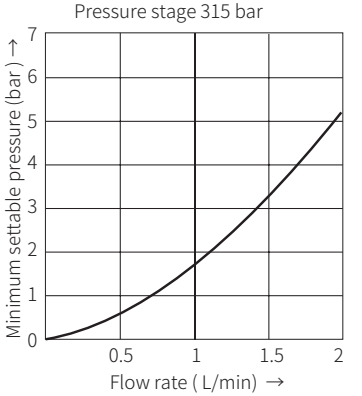
Pressure stage 230 bar



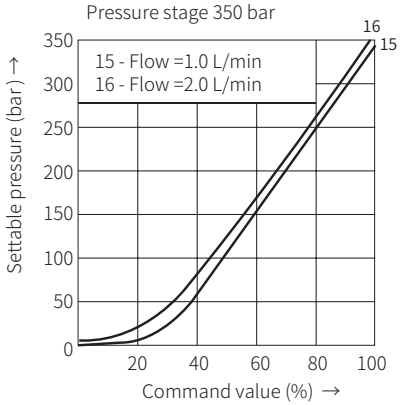
Pressure stage 315 bar



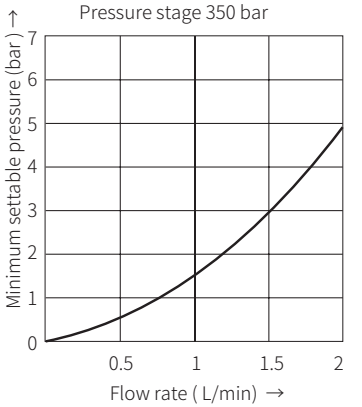
Pressure stage 315 bar



Pressure stage 350 bar

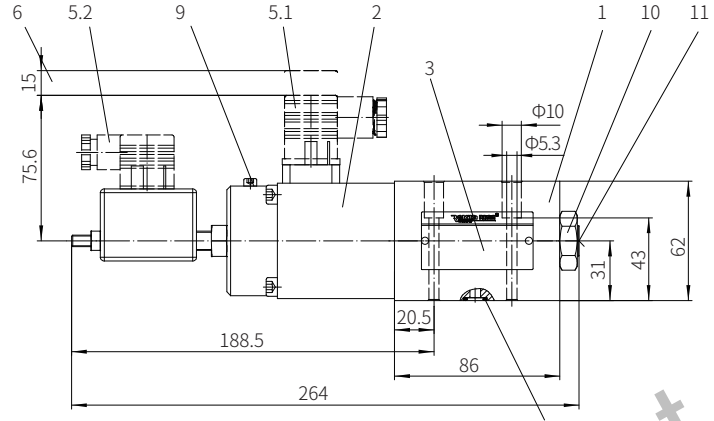


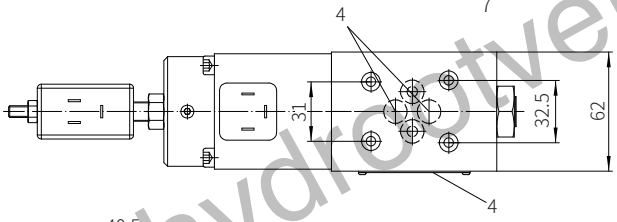
Pressure stage 350 bar

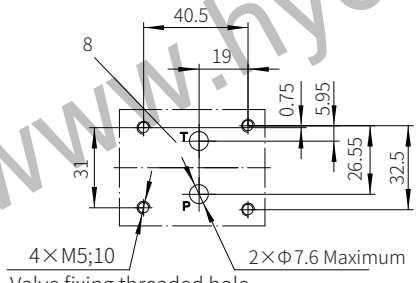


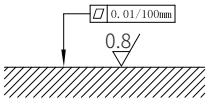
Component size

Size unit: mm









Required surface finishing of mating components

Valve fixing screw

M5x50-10.9 grade GB/T70.1-2000

Tightening torque M_A=7.8Nm

1 Valve body
2 Proportional solenoid with inductive position transducer
3 Name plate
4 Blind hole
5 Plug-in connector
6 Space required to remove the plug-in connector
7 Identical seal rings for P, T and blind hole
8 Machined valve mounting surface

Differences from the standard:

- Locating pin not present
- A and B ports not drilled

9 Bleed screw
10 Lock nut SW27
11 Internal hexagon SW8