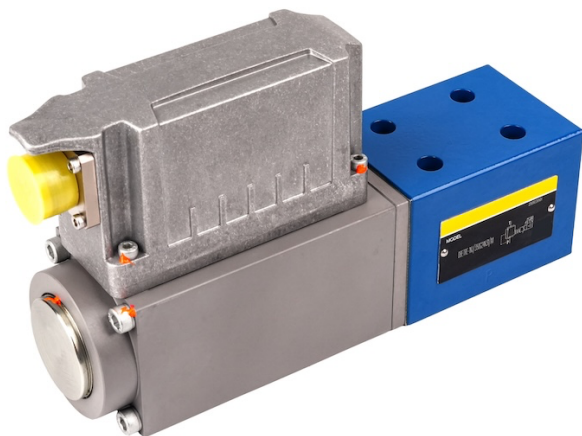


Direct Operated Proportional Relief Valve (with inductive position transducer)

Model: DBETR(E)...1X



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

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Features

- Low hysteresis
- Good repeatability
- Electrical closed loop position control of spring pre-tension
- Integrated amplifier, optional

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.

The DBETRE-1XJ proportional relief valve is functionally identical to the DBETR valve. This valve integrates an onboard amplifier (OBE) and proportionally adjusts pressure via an internal proportional solenoid (10) with an integrated LVDT sensor. The electrical signals are connected through a 7-pin connector (11).

Advantages:

- Low hysteresis
- Good repeatability

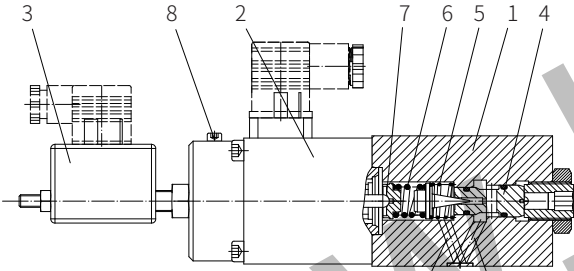
When the command value of the proportional solenoid is zero or power failure or the cable breakage at the positional transducer, it must be adjusted to the minimum settable pressure.

Note!

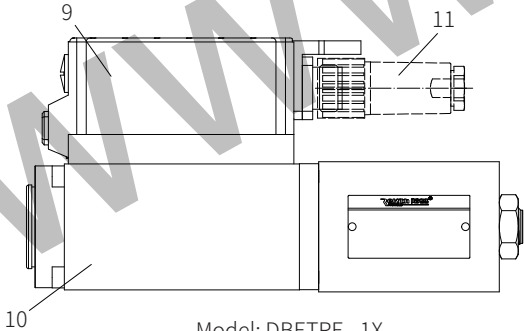
In order to ensure optimum valve function of the valve, it should be bled when valve used:

- 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).



Model: DBETR...1X



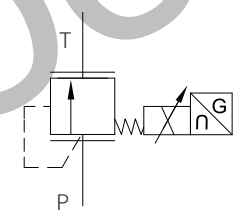
Model: DBETRE...1X

Models and specifications

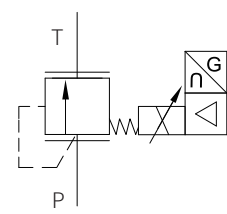
DBETR	-1X	/	G24	*
proportional relief valve				more information in text
without amplifier	=No code			sealing material
with amplifier	=E			No code= NBR seals
10 to 19 series	=1X			V= FKM seals
(10 to 19 series installation and connection size unchanged)				(consult for other seals)
pressure stage up to 30bar	=30			electrical connections for model DBETR:
pressure stage up to 80bar	=80			K4= square socket without plug
pressure stage up to 180bar	=180			K31= for model DBETRE:
pressure stage up to 230bar	=230			7-pin connector
pressure stage up to 315bar	=315			control electronics supply voltage
pressure stage up to 350bar	=350			G24= 24V DC

Functional symbols

Model: DBETR...1XJ



Model: DBETRE...1XJ



Technical parameters

Overview			
Installation position		Preferably horizontal	
Storage temperature range		°C	-20 to +80
Environment temperature range		°C	-20 to +50
Weight		kg	4.0
Hydraulic (measured when using HLP46, $\vartheta_{oil} = 40^{\circ}C \pm 5^{\circ}C$)			
Working pressure	Port P	bar	50
	Port T, with pressure control	bar	100
	Without pressure control, Port T	bar	200

Technical parameters

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 180L/min	3	
	Pressure stage 230L/min	3	
	Pressure stage 315 L/min	2	
	Pressure stage 350L/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	
Cleanliness of oil ³⁾		The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15	
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 dependent on the system	(0 to 100%)	p_{min} - p_{max}	p_{max} - p_{min}
	Pressure stage 30,80,180	ms	100
	Pressure stage 230,315,350	ms	150

3) 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 (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	

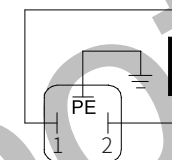
Technical parameters

Electrical (inductive position transducer)					
Coil resistance	Total resistance of the coils	Ω	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 fixed plug-in connector			

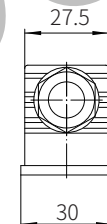
Electrical connections

Proportional solenoid

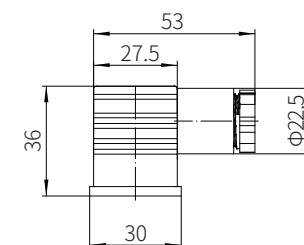
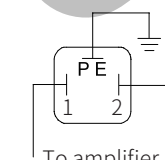
Connection at component plug



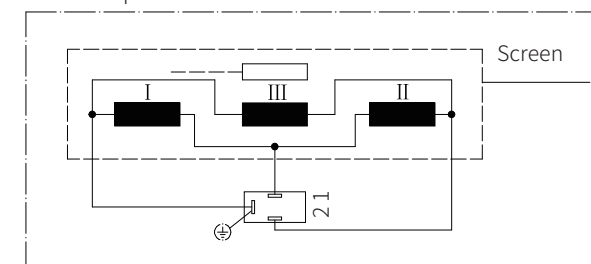
Plug-in connector



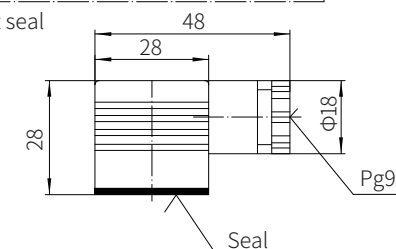
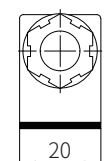
Connection at plug-in connector



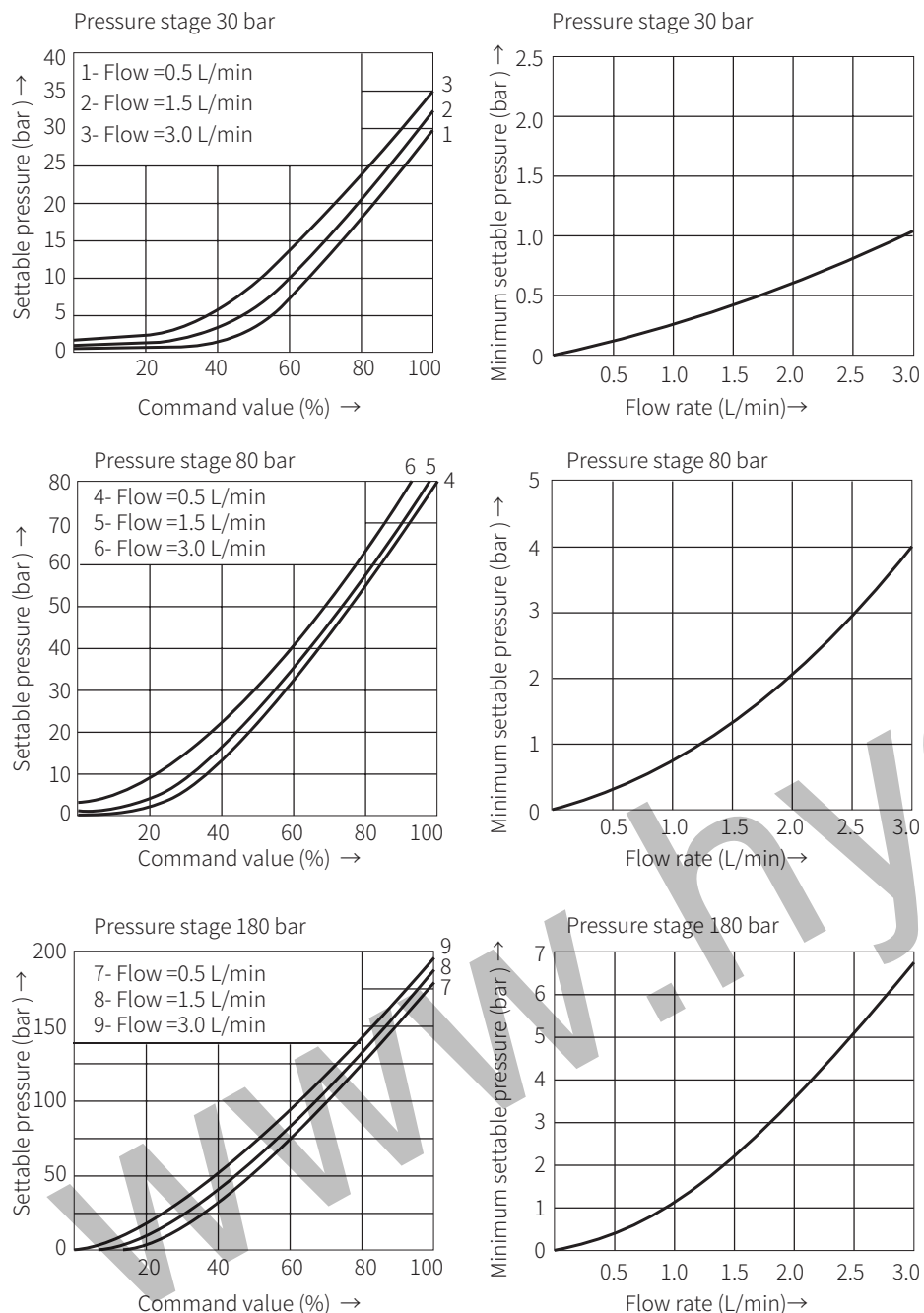
Inductive position transducer



Plug-in connector with flat seal

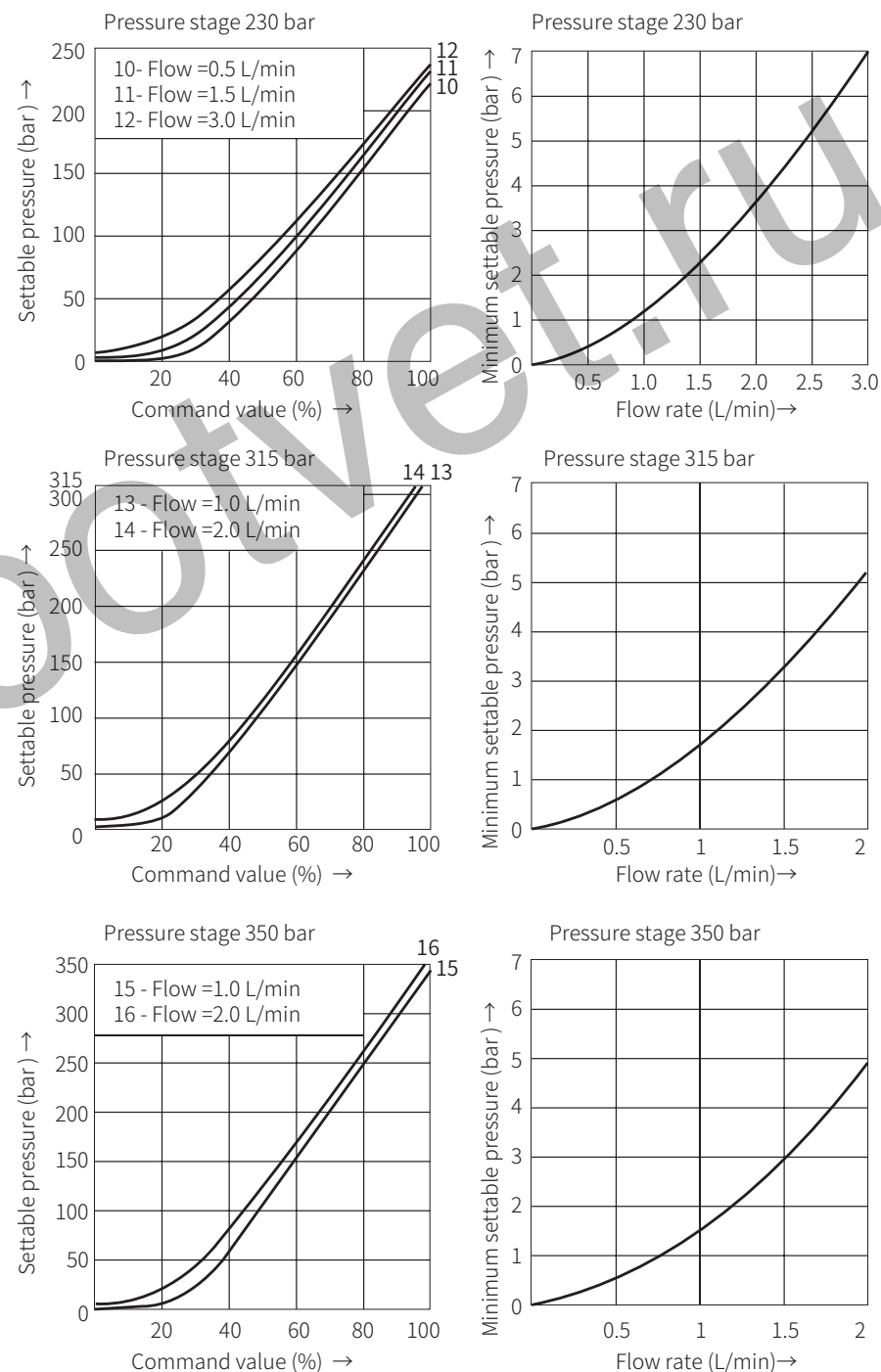


Characteristic curve

(Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

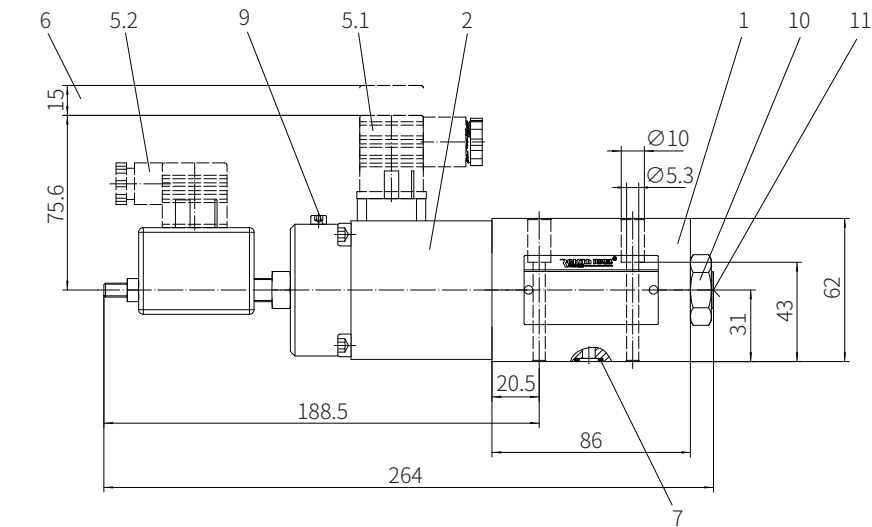
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Characteristic curve

(Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

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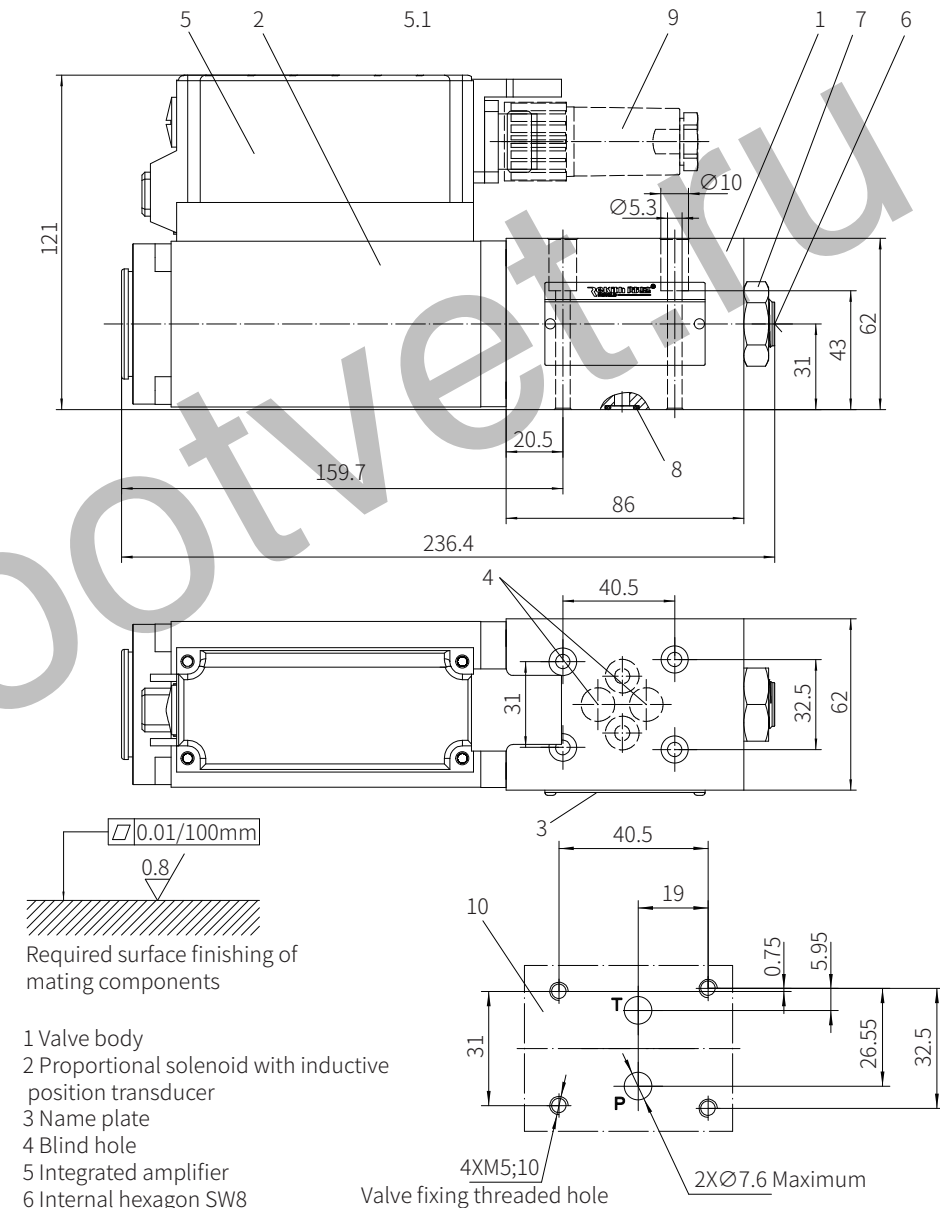
Model DBETR...1X



- 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

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque $M_A=7\text{Nm}$

Model DBETRE...1XJ



- 1 Valve body
 - 2 Proportional solenoid with inductive position transducer
 - 3 Name plate
 - 4 Blind hole
 - 5 Integrated amplifier
 - 6 Internal hexagon SW8
 - 7 Lock nut SW27
 - 8 Identical seal rings for P, T and blind hole
 - 9 7-pin aviation connector
 - 10 Machined valve mounting surface
- Differences from the standard:
- Locating pin not present
 - A and B ports not drilled

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque $M_A=7\text{Nm}$