Proportional pressure relief valve

01/06

Type DBETX...1X

NG 6
Max pressure 315bar
Nominal flow 1L/min

Contents

Features

- Direct operated valves for limiting system pressure
- Adjustable by means of the solenoid current, see performance curve, Technical data and selected valve electronics
- Pressure limitation to a safe level even with electric failure (solenoid current I > Imax)
- For subplate attachment, mounting hole configuration to ISO 4401-03-02
- External trigger electronics with ramps and valve calibration (order separately)

Function and configuration

Type DBETX proportional pressure relief valves are remote controlled (pilot) valves in conical seat design. They are used to limit system pressure. The valves are actuated by means of a proportional solenoid. The interior of the solenoid is connected to port T and is filled with pressure fluid. With these valves, the system pressure that needs to be limited can be infinitely adjusted by the valve amplifier electronics in relation to the solenoid current, at an oil flow < 1L that is as close as possible to constant.

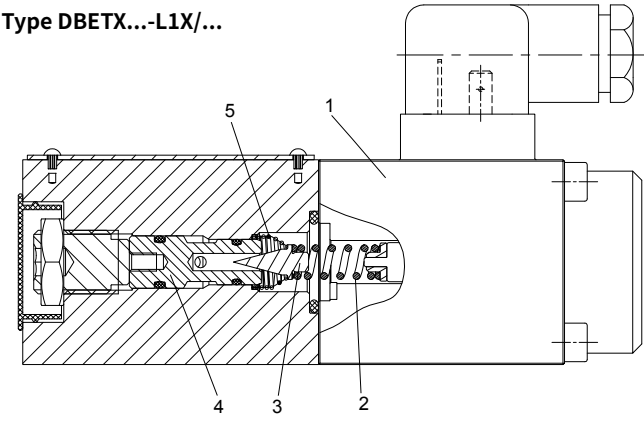
Basic principle

To adjust the system pressure, a setpoint is set in the trigger electronics. Based on this setpoint, the electronics control the solenoid coil(1) with regulated PWM (pulse-width-modulated) current. The proportional solenoid converts the current to a mechanical force, which acts on a main spring(2) by means of the armature plunger. An "additional" spring(5) between the cone(3) and the seat(4) contributes to stability and a minimal residual pressure. The spring force acting on the cone and the pressure in the valve seat balance one another at a constant oil flow (0.7...1L/min). The "pmax" pressure stage is determined by the cone and seating bore configuration.

Pressure limitation for maximum safety

If a fault occurs in the electronics, so that the solenoid current (Imax) would exceed its specified level in an uncontrolled manner, the pressure cannot rise above the level determined by the maximum spring force.

Type DBETX...-L1X/...



Technical data

General		
Construction		Poppet valve, direct drive
Actuation		Proportional solenoid without position control, external amplifier
Connection type		Subplate, mounting hole configuration NG6 (ISO 4401-03-02-0-05)
Mounting position		Optional
Ambient temperature range	°C	-20...+50
Weight	Kg	about 2.1
Vibration resistance, test condition		Max. 25 g, shaken in 3 dimensions (24 h)

Hydraulic (measured with HLP 46, ϑ_{oil}=40°C ±5°C)							
Pressure fluid			Hydraulic oil to DIN 51524...535, other fluids after prior consultation				
Viscosity range	recommended	mm^2/s	20...100				
	max. permitted	mm^2/s	10...800				
Pressure fluid temperature range		°C	-20...+80				
Maximum permitted degree of contamination of pressure fluid Purity class to ISO 4406 (c)			Class 18/16/13				
Direction of flow			See symbol				
Max. set pressure (at Q = 1 l/min)		bar	50	80	180	250	315
Minimum pressure (at Q = 1 l/min)		bar	2	3	4	5	8
Max. working press. (at Q = 1 l/min)		bar	Port P: 315				
Max. pressure		bar	Port T: 250				
Max. mechanical pressure limitation level, e.g. when solenoid current $I>I_{max}$		bar	< 55	< 85	< 186	< 258	< 325

Static/Dynamic		
Hysteresis	%	⩽ 4
Response time 100% signal change	ms	On < 60 / Off < 70
Range of inversion	%	⩽ 3
Electrical		
Cyclic duration factor	%	100 ED
Degree of protection		IP 65 to DIN 40050 and IEC 14434/5
Solenoid connection		Plug-in connector to DIN EN 175301-803/ISO 4400
Power		24VDCnom

Ordering code

DBETX – 1X / G24 – 8 | N | Z4 | V | *

Proportional pressure reflief valve

Series 10~19 = 1X

Max. pressure stage
up to 50 bar =50
up to 80 bar =80
up to 180 bar =180
up to 250 bar =250
up to 315 bar =315

Voltage supply of trigger electronics
24V DC =G24

Further details in the plain text

V = FKM
No code= NBR

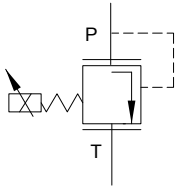
Electrical connection
K4= With plug-in connector
Z4= Without plug-in connector

N= Manual auxiliary override

Solenoid type(current)
8= Solenoid current 0.8A max.
25= Solenoid current 2.5A max.

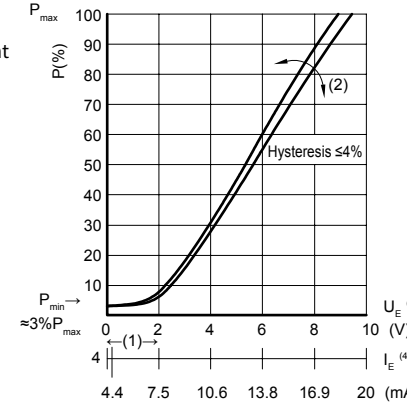
Symbols

For external trigger electronics



Performance curves (measured with HLP46, ϑ_{oil}=40°C ±5°C)

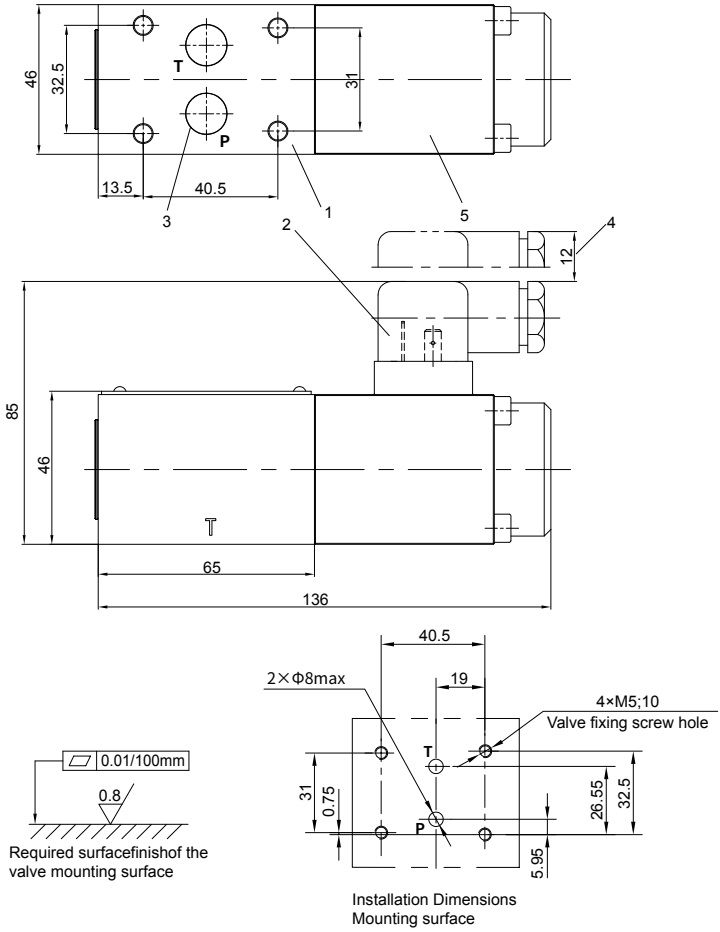
Pressure in port P as a function of the setpoint
Nominal flow Q_{nom}=1L/min



(1) Zero adjustment
(2) Sensitivity adjustment
(3) Version: U_E=0...10V
(4) Version: I_E=4...20mA

Unit dimensions

(nominal dimensions in mm)



1 Valve housing
2 Plug-in connector
3 Identical seal rings for ports P and T (O-ring 9.25×1.78)
4 Space required to remove the plug-in connector
5 Proportional solenoid

Valve fixing screws

The following valve fixing screws are recommended:

- 4 GB / T 70.1 - M5×30 - 10.9
- Tightening torque M_A=6 Nm