6.3

# Proportional pressure relief valve, pilot operated

## Type DBE6X...L2X

Size 6
Up to P 315bar，T 250bar
Up to 40 L/min

## Contents



## Features

—Pilot operated valves (pilot valves) for limiting system pressure (pilot oil internal only).
—Adjustable by means of the solenoid current, see Characteristic curve, technical data and selected valve electronics.
—Solenoid versions Imax=0.8A or Imax=2.5A
—Pressure limitation to a safe level even with faulty electronics (solenoid current I > Imax ).
—For subplate attachment, mounting hole configuration to ISO 441-03-02-0-94.
—Plug-in connector to DIN 43650-AM2 included in scope of delivery.
—External trigger electronics with ramps and valve calibration in the following versions/ designs VT-SSPA1-508/516/525-L2X/V0/*

## Function and configuration

**General**

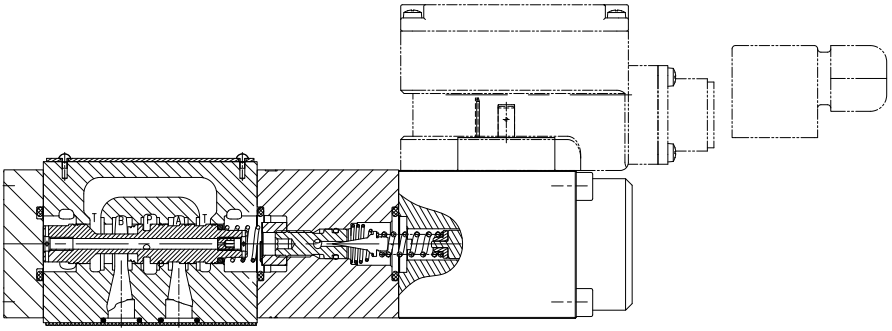
Type DBE6X proportional pressure relief valves are pilot operated pressure relief valves.
The internal pilot stage in the conical seat version and the main stage in the spool version are located in the valve body. The valves are actuated by means of a proportional solenoid.
The solenoid is cushioned by restrictors in the armature to aid dynamic stability. The interior of the solenoid is connected to port T and is filled with pressure fluid. Bleeding is achieved by means of a screw plug. With these valves, the system pressure that needs to be limited can be infinitely adjusted in relation to the solenoid current.

**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 with regulated PWM (pulse-width-modulated) current.
The regulated current is additionally modulated with a dither, ensuring low hysteresis. The proportional solenoid converts the current to a mechanical force, which acts on a main spring in the pilot stage by means of the armature plunger. The pilot stage is supplied with pilot oil via a bore at <0.6 L/min. The "$P_{max}$" 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 ($I_{max}$) would exceed its specified level in an uncontrolled manner, the pressure cannot rise above the level determined by the maximum spring force.



## Ordering code

| DBE6X | – L2X / | G24 – 8 | N | / | V |
|---|---|---|---|---|---|

Proportional pressure relief valve NG6 pilot operated

With integrated electronics(OBE) =E
Without integrated electronics =No code

Series L20~L29 =L2X

Max. pressure stage
up to 80 bar = 80
up to 180 bar = 180
up to 250 bar = 250
up to 315 bar = 315
up to 350 bar = 350

G24 = 24V DC

Solenoid type (current)
Solenoid current 0.8A max. (for type DBE6XE) =8
Solenoid current 1.5A max. =15
Solenoid current 2.5A max. =25

V = FKM
No code = NBR

For type DBE6XE
A1= Command/actual value 0 to 10V
F1= Command/actual value 4 to 20mA

For type DBE6XE:
K31= Without plug-in connector
Z31= With plug-in connector
For type DBE6X :
K4= Without plug-in connector
Z4= With plug-in connector

N = Manual auxiliary override

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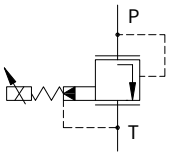
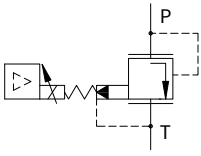
## Symbols




With external control electronics




With integrated electronics

## Technical data

| **General** | | | |
|---|---|---|---|
| Construction | Pilot stage | | Poppet valve |
| | Main stage | | Spool valve |
| Construction | | | Proportional solenoid without position control, external amplifier |
| Connection type | | | Subplate, mounting hole configuration NG6 (SIO 4401-03-02-094) |
| Mounting position | | | Optional |
| Ambient temperature range | | °C | -20 to +50 |
| Weight | | Kg | 2.2 |
| Vibration resistance, test condition | | | Max. 25 g, shaken in 3 dimensions (24 h) |

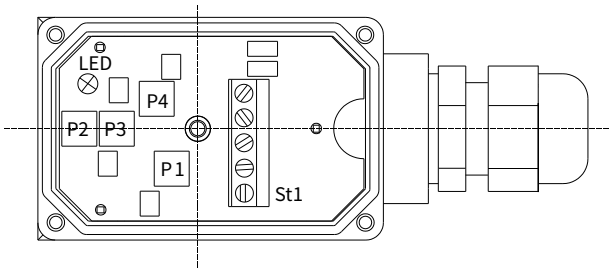
| **Hydraulic** (measured with HLP 46, $\vartheta_{oil}$ = 40°C ±5°C ) | | | | | | |
|---|---|---|---|---|---|---|
| Pressure fluid | | | Hydraulic oil to DIN 51524...535, other fluids after prior consultation | | | |
| Viscosity range | recommended | $mm^2/s$ | 20...100 | | | |
| | max. permitted | $mm^2/s$ | 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 Qmax=1 L/min) | | bar | 80 | 180 | 250 | 315 |
| Min. pressure (at Qmin=1 L/min) | | bar | 7 | 8 | 9 | 10 |
| Max. working pressure | | bar | Port P: 315 | | | |
| | | | Port T: 250 | | | |
| Max. mechanical pressure limitation level, e.g. when solenoid current I>$I_{max}$ | | bar | < 90 | < 190 | < 260 | < 325 |
| Pilot oil flow | | L/min | Approx. 0.6 | | | |
| Max. flow | | L/min | 40 | | | |

| **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 43650/ISO 4400, M16X1.5 (2P+PE) |
| Valve with solenoid type | | | 0.8A / 2.5A |
| Max. solenoid current | | Imax | 0.8A / 2.5A |
| Coil resistance R20 | | Ω | 22 / 3 |
| Max. power consumption at 100% load and operating temperature | | VA | 25 / 30 |

| **Static/Dynamic** | | |
|---|---|---|
| Hysteresis | | % | ⩽ 4 |
| Range of inversion | | % | ⩽ 3 |
| Manufacturing tolerance for Pmax | | % | ⩽ 10 |
| Response time 100% signal change | | ms | On 200 / Off <250 |

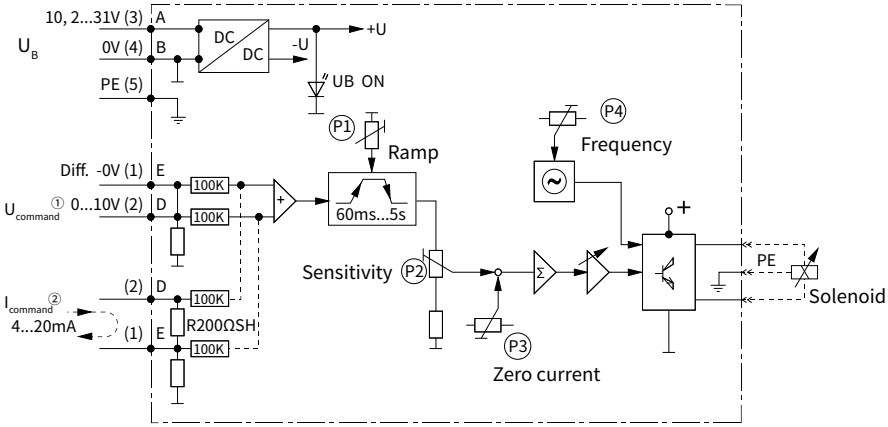
# Valve with external trigger electronics

## Connections and adjustment




P1 – Ramp time
P2 – Sensitivity
P3 – Zero point
P4 – Dither frequency
St 1 – Connection terminal
LED – Display $U_B$

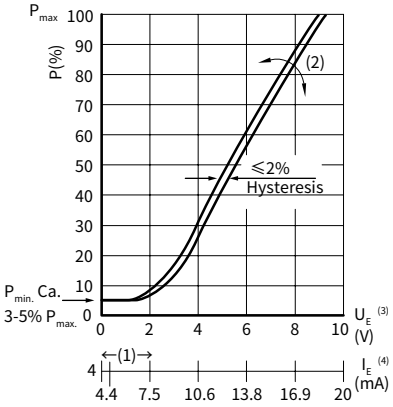
## Block diagram and pin assignment




① Version with 0...+10 V signal
② Version with 4...20 mA signal

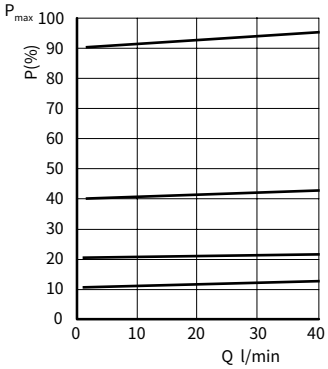
## Characteristic curves (measured with HLP46, $\vartheta_{oil}$=40°C ±5°C )

### Pressure in port P as a function of the setpoint



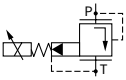

(1) Zero adjustment
(2) Sensitivity adjustment
(3) Version: $U_E$ = 0...10V
(4) Version: $I_E$ = 4...20mA

### Pressure in port P proportionate to the maximum flow of the main stage



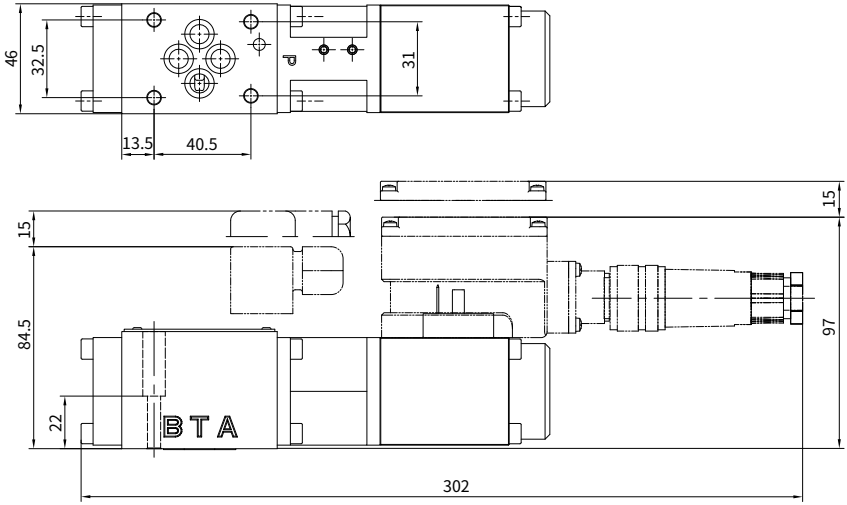

Set pressure

p' = f ( $Q_{P-T}$ )



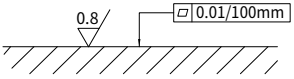
## Unit dimensions

(nominal dimensions in mm)

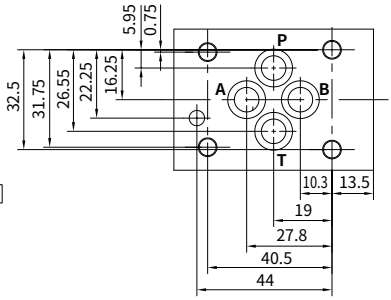





Mouting hole configuration:
NG6(ISO 4401-03-02-0-94)




Required surfacefinishof the valve mounting surface




Installation Dimensions
Mounting surface