Rexroth
Bosch Group

Proportional pressure relief valve, pilot operated

RE 29156/07.05 1/10

Type DBE6X

Nominal size 6
Unit series 1X
Maximum working pressure P 315 bar, T 250 bar
Maximum flow rate 40 l/min

List of 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 $I_{max} = 0.8$ A or $I_{max} = 2.5$ A
- Pressure limitation to a safe level even with faulty electronics (solenoid current $I > I_{max}$)
- For subplate attachment, mounting hole configuration to ISO 4401-03-02-0-94
  Subplates as per catalog sheet RE 45053 (order separately)
- 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 (order separately)
  • Plug, setpoint 0...+10 V or 4...20 mA, RE 30264
  • Module, setpoint 0...+10 V, RE 30222
  • Europe card, setpoint 0...+10 V, RE 30109

Ordering data

DBE6	X – 1X /	G24 –	N	Z4	M	*

Proportional pressure relief valve NG6, pilot operated

Mounting hole configuration to ISO 4401-03-02-0-94 **= X**

Unit series 10 to 19 (10 to 19: installation and connection dimensions unchanged) **= 1X**

Max. pressure stage
- up to 80 bar **= 80**
- up to 180 bar **= 180**
- up to 315 bar **= 315**

Voltage supply of trigger electronics 24 V DC **= G24**

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

N = **Manual auxiliary override**

Z4 = **Electrical connection**
Unit plug to DIN 43650-AM2
Plug-in connector included in scope of delivery

M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51524

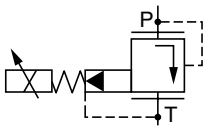
Further information in plain text

Preferred types

Solenoid 0.8 A		**Solenoid 2.5 A**	
Type	**Material Number**	**Type**	**Material Number**
DBE6X–1X/80G24–8NZ4M	0 811 402 045	DBE6X–1X/80G24–25NZ4M	0 811 402 040
DBE6X–1X/180G24–8NZ4M	0 811 402 044	DBE6X–1X/180G24–25NZ4M	0 811 402 041
DBE6X–1X/315G24–8NZ4M	0 811 402 043	DBE6X–1X/315G24–25NZ4M	0 811 402 042

Symbol

For external trigger electronics



Function, sectional diagram

General

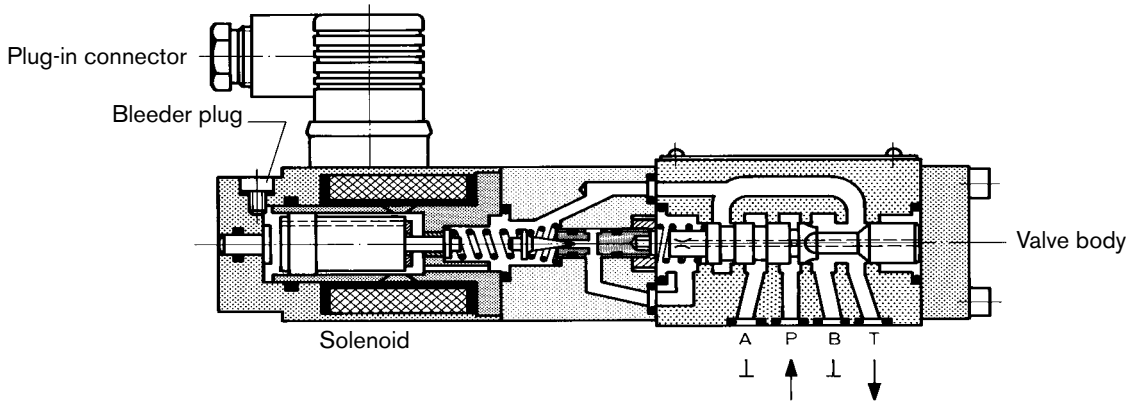
Type DBE6X proportional pressure relief valves are pilot operated pressure relief valves.
The internal pilot stage in the conical seat version and the main stage in the spool version are located in the valve body.
The valves are actuated by means of a proportional solenoid.
The solenoid is cushioned 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.



Accessories

Type				Material Number
(4 x) ISO 4762-M5x30-10.9	Cheese-head bolts			2 910 151 166
Plug	VT-SSPA1-525-20/V0	(2.5 A)	RE 30264	0 811 405 143
	VT-SSPA1-508-20/V0	(0.8 A)		0 811 405 144
	VT-SSPA1-525-20/V0/I	(2.5 A)		0 811 405 145
	VT-SSPA1-508-20/V0/I	(0.8 A)		0 811 405 162
Module	VT-MSPA1-525-10/V0	(2.5 A)	RE 30222	0 811 405 127
	VT-MSPA1-508-10/V0	(0.8 A)		0 811 405 126
Europe card	VT-VSPA1-525-10/V0/RTP	(2.5 A)	RE 30109	0 811 405 079
	VT-VSPA1-508-10/V0/RTP	(0.8 A)		0 811 405 081
Plug-in connector 2P+PE	Plug-in connector 2P+PE (M16x1.5) included in scope of delivery, see also RE 08008.			

Testing and service equipment

Test box type VT-PE-TB1, see RE 30063
Current measuring adapter type VT-PA-5, see RE 30073

Technical data

General

Construction	Pilot stage		Poppet valve
	Main stage		Spool valve
Actuation			Proportional solenoid without position control, external amplifier
Connection type			Subplate, mounting hole configuration NG6 (ISO 4401-03-02-0-94)
Mounting position			Optional
Ambient temperature range		°C	–20...+50
Weight		kg	2.2
Vibration resistance, test condition			Max. 25 g, shaken in 3 dimensions (24 h)

Hydraulic (measured with HLP 46, $\vartheta_{oil} = 40\,°C \pm 5\,°C$)

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 [1]		
Direction of flow			See symbol		
Max. set pressure (at $Q = 1$ l/min)		bar	80	180	315
Minimum pressure (at $Q_{min} = 1$ l/min)		bar	7	8	10
Max. mechanical pressure limitation level, e.g. when solenoid current $I > I_{max}$		bar	<90	<190	<325
Max. working pressure		bar	Port P: 315		
Max. pressure		bar	Port T: 250		
Pilot oil flow		l/min	approx. 0.6		
Max. flow		l/min	40		

Electrical

Cyclic duration factor		%	100	
Degree of protection			IP 65 to DIN 40050 and IEC 14434/5	
Solenoid connection			Unit plug DIN 43650/ISO 4400, M16 x 1.5 (2P+PE)	
Valve with solenoid type			0.8 A	2.5 A
Max. solenoid current		I_{max}	0.8 A	2.5 A
Coil resistance R_{20}		Ω	22	3
Max. power consumption at 100 % load and operating temperature		VA	25	30

Static/Dynamic [2]

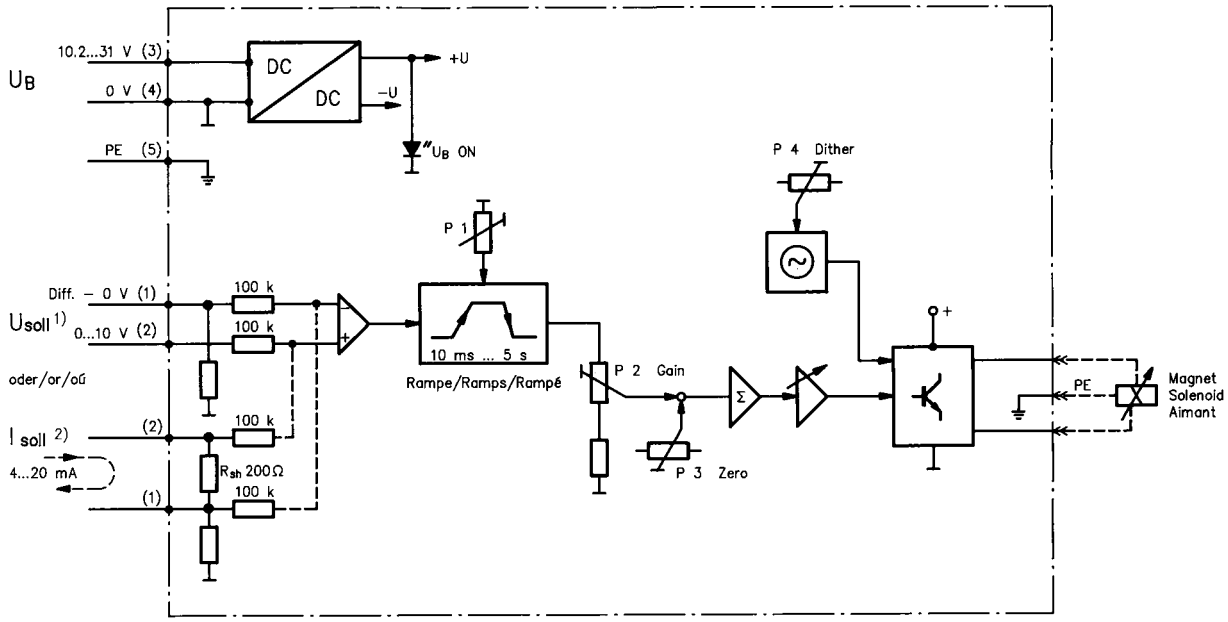
Hysteresis		%	≤ 4
Range of inversion		%	≤ 3
Manufacturing tolerance for p_{max}		%	≤ 10
Response time 100 % signal change		ms	On 200 / Off < 250

[1] The purity classes stated for the components must be complied with in hydraulic systems. Effective filtration prevents problems and also extends the service life of components. For a selection of filters, see catalog sheets RE 50070, RE 50076 and RE 50081 .

[2] All characteristic values ascertained using amplifier 0 811 405 079 for the 2.5 A solenoid and 0 811 405 081 for the 0.8 A solenoid.

Valve with external trigger electronics (plug, RE 30264)

Circuit diagram/pin assignment

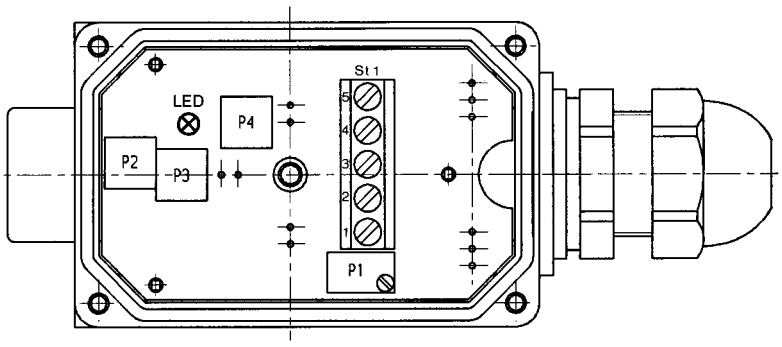


1) Version with 0...+10 V signal

2) Version with 4...20 mA signal

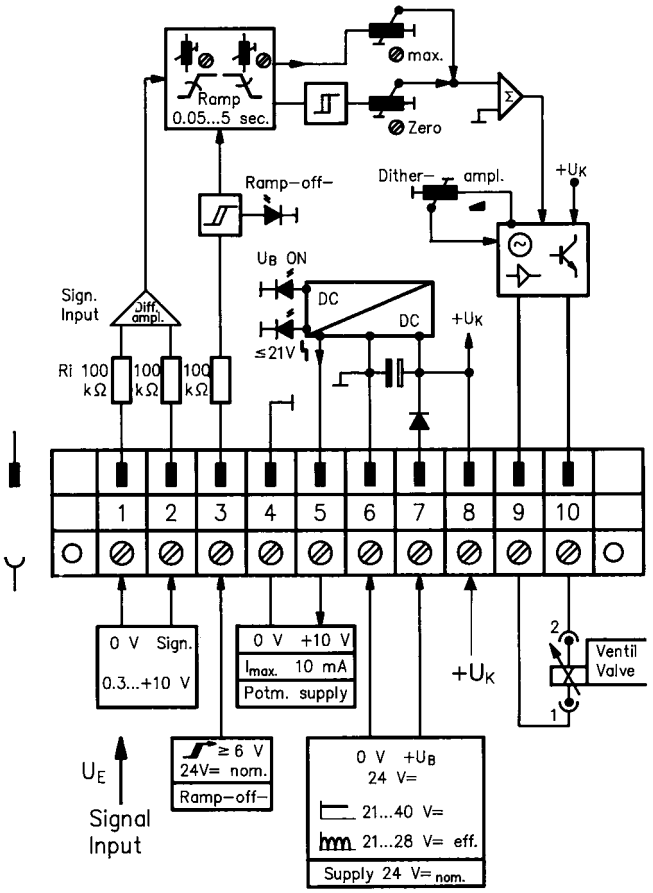
Connection/calibration

P1 – Ramp time
P2 – Sensitivity
P3 – Zero
P4 – Dither frequency
St1 – Terminal
LED – U_B display

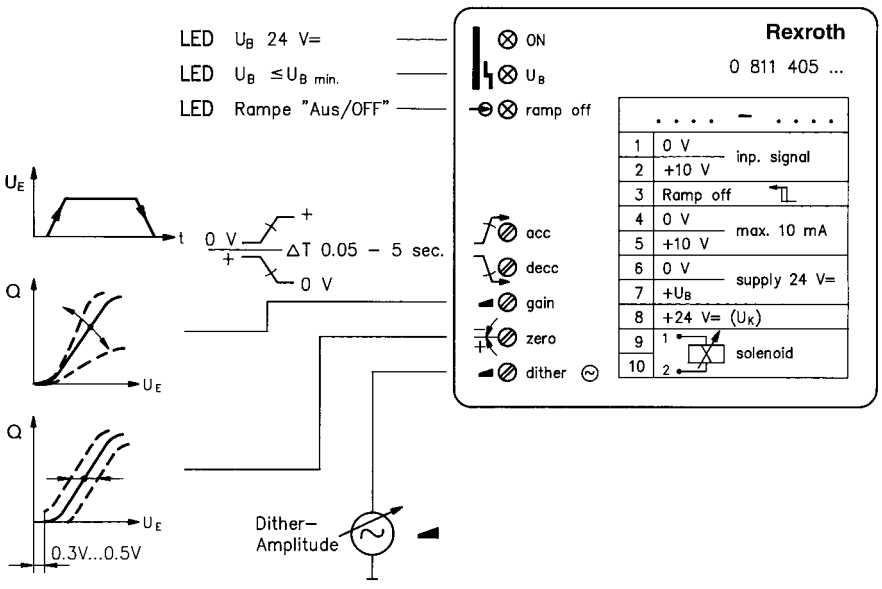


Valve with external trigger electronics (module, RE 30222)

Circuit diagram/pin assignment

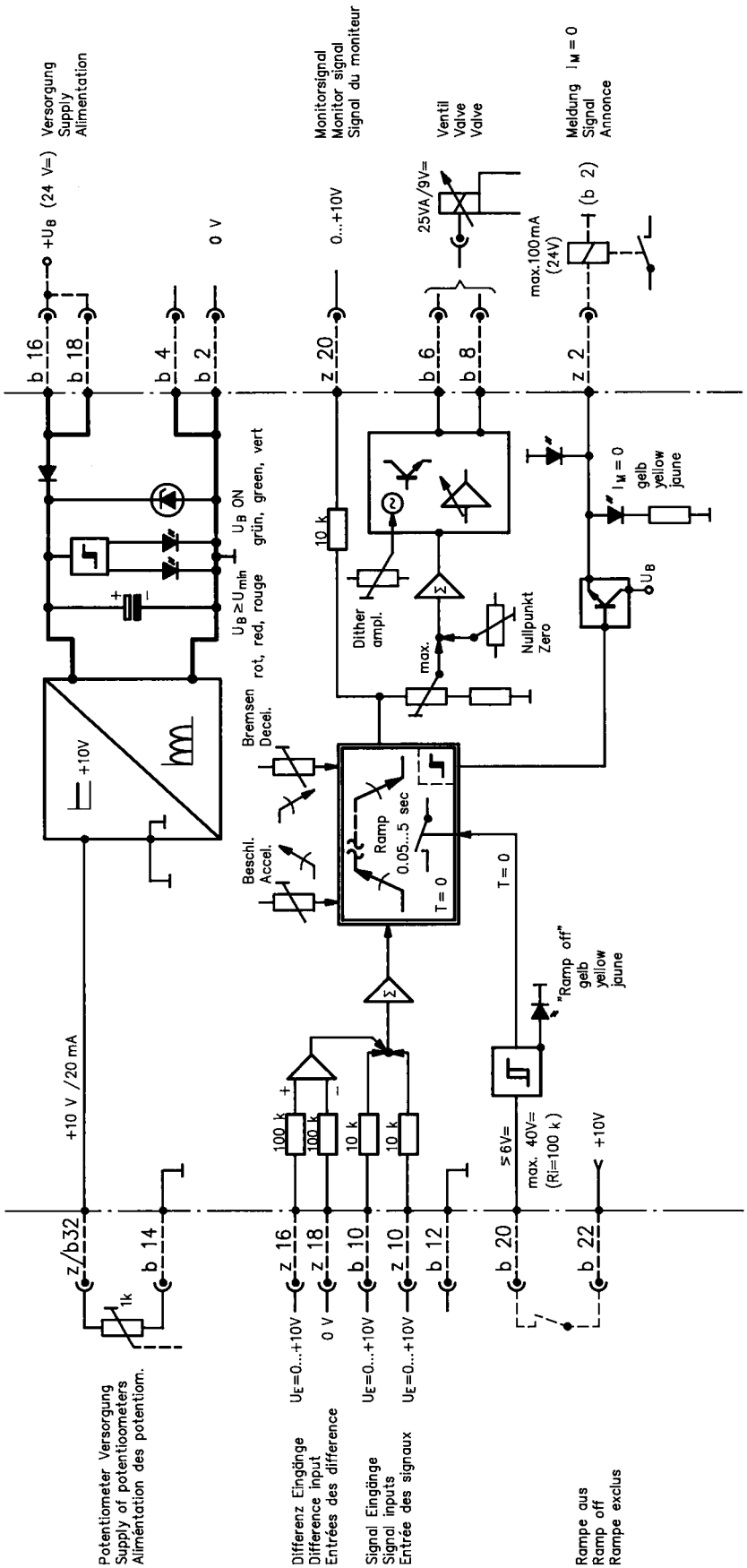


Front view/calibration



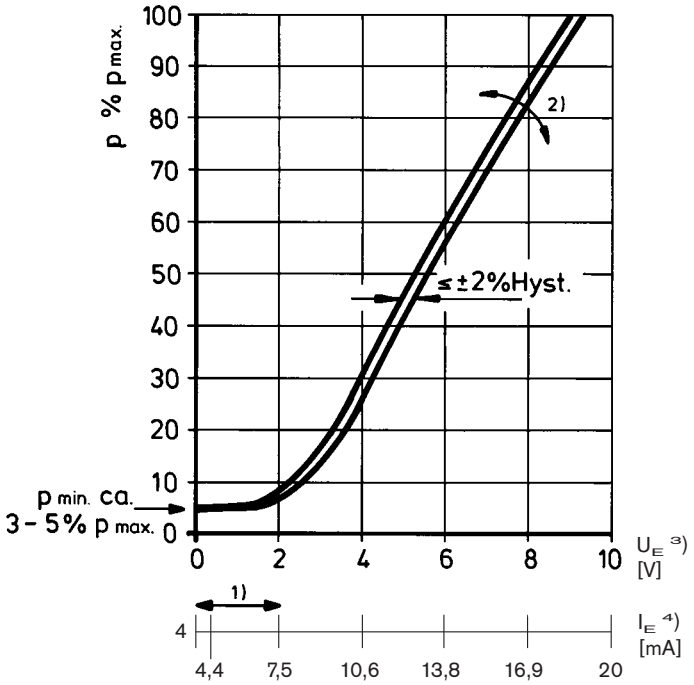
Valve with external trigger electronics (europe card, RE 30109)

Circuit diagram/pin assignment



Characteristic curves (measured with HLP 46, $\vartheta_{oil} = 40\,°C \pm 5\,°C$)

Pressure in port P as a function of the setpoint



Valve amplifier

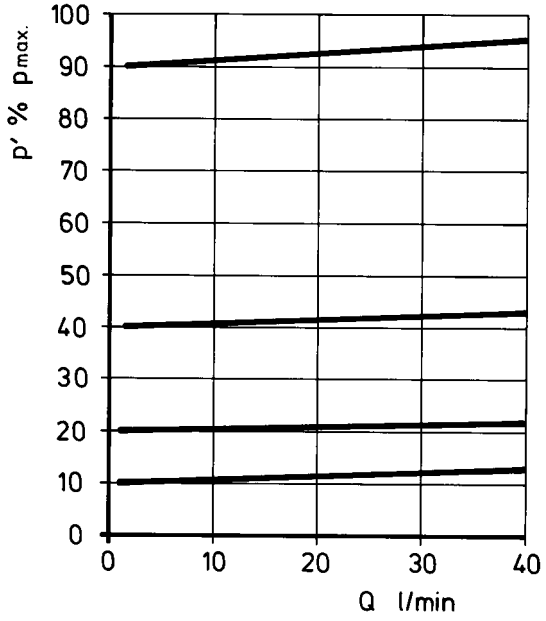
1) Zero adjustment

2) Sensitivity adjustment

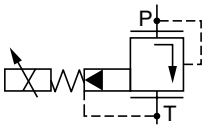
3) Version: $U_E = 0...+10$ V

4) Version: $I_E = 4...20$ mA

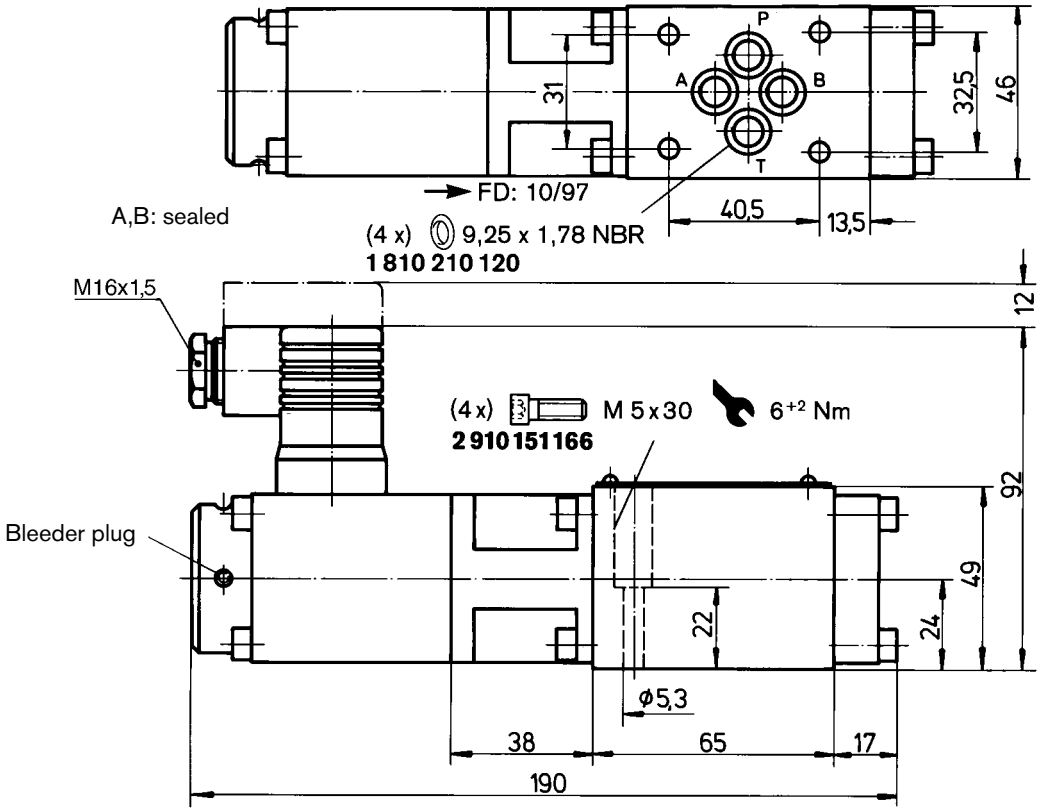
Pressure in port P proportionate to the maximum flow of the main stage



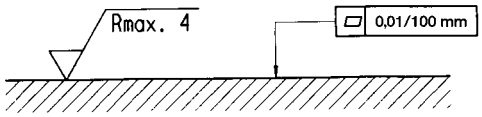
Set pressure
$p' = f(Q_{P-T})$



Unit dimensions (nominal dimensions in mm)

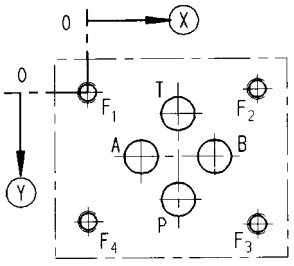


Required surface quality of mating component



Mounting hole configuration: NG6 (ISO 4401-03-02-0-94)
For subplates see catalog sheet RE 45053

[1] Deviates from standard
[2] Thread depth:
Ferrous metal 1.5 x Ø
Non-ferrous 2 x Ø



	P	A	T	B	F_1	F_2	F_3	F_4
Ⓧ	21.5	12.5	21.5	30.2	0	40.5	40.5	0
Ⓨ	25.9	15.5	5.1	15.5	0	–0.75	31.75	31
∅	8 [1]	8 [1]	8 [1]	8 [1]	M5 [2]	M5 [2]	M5 [2]	M5 [2]

Notes

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