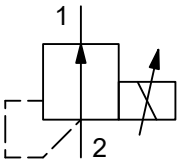
BUCHER hydraulics

Pressure valve
Relief function

Q_{max} = 1.5 l/min, p_{max} = 420 bar
Direct acting, poppet type, proportional solenoid
Type series: DVSA-1L...

- Screw-in cartridge valve for cavity AL
- All external parts with zinc-nickel plating according to DIN EN ISO 19598
- Installation in threaded port body type GALA
- Seated pilot stage
- In a power failure, the pressure setting drops to the minimum value
- Can be used as a pilot valve
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope
- Various plug-connector systems and voltages are available
- High pressure wet-armature solenoids

Symbol



Description

These proportional pressure relief valves, series DVS_-1L..., are size 1 pilot valves featuring a seat-valve design and a 3/4-16 UNF mounting thread. With these pressure- relief valves, the relief pressure is dependent on the electrical control signal and can be continuously varied. When the solenoid is de-energized (initial position), connection 2 to 1 is open and the minimum pressure (free flow) depends on the flow rate. Any pressure at port 1 is additive to the valve setting at port 2, therefore port 1 should preferably be connected directly to tank. In control mode, the relief pressure is proportional to the change in the required value (amplifier output current). In order to obtain precise pressure settings over the whole of the required pressure range (optimum resolution); the pressure relief valves are available in five pressure levels. All external parts of the valves are zinc-nickel plated and are thus suitable for use in the harshest operating environments. The slip-on coils can be replaced without opening the hydraulic envelope and can be positioned at any angle

through 360°. These proportional pressure relief valves are primarily used as pilot valves, mainly in mobile and industrial applications to allow a pressure in hydraulic installations to be limited electro-proportionally. For self-assembly, please refer to the section related data sheets.

Technical data

General characteristics	Description, value, unit
Function group	pressure valve
Function	relief function
Design	screw-in cartridge valve
Controls	proportional solenoid
Characteristic	direct acting, poppet type
Construction size	NG 1
Thread size	3/4-16 UNF-2A
Mounting attitude	unrestricted (preferably vertical, coil down)
Weight	0.40 kg
Cavity acc. factory standard	AL
Tightening torque steel	40 Nm
Tightening torque aluminium	40 Nm
Tightening torque tolerance	± 10 %
Minimum ambient temperature	- 30 °C
Maximum ambient temperature	+ 50 °C
Surface protection	all external parts with zinc-nickel plating according to DIN EN ISO 19598
Sealing material	see ordering code
Seal kit order number	NBR: DS-355-N / FKM: DS-355-V

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	420 bar
Restriction of the operating pressure	port 1 = max. 250 bar [1])
Maximum flow rate	1.5 l/min
Flow direction	see symbol
Hydraulic fluid	HL and HLP mineral oil according to DIN 51 524; other fluids on request!
Minimum fluid temperature	- 30 °C
Maximum fluid temperature	+ 70 °C
Viscosity range	15 ... 380 mm^2/s (cSt)
Recommended viscosity range	20 ... 130 mm^2/s (cSt)
Minimum fluid cleanliness (cleanlineless class according to ISO 4406:1999)	class 18/16/13
Nominal pressure range	nominal pressure range 040: ...40 bar nominal pressure range 100: ...100 bar nominal pressure range 160: ...160 bar nominal pressure range 250: ...250 ominal pressure range 350: ...350 bar

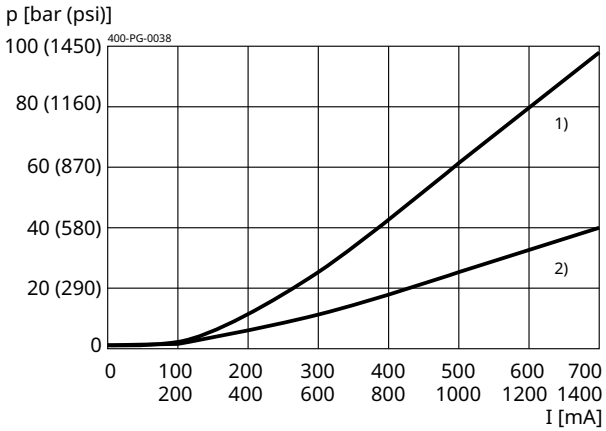
NOTE!
[1]) Please note that any tank or return-line pressures acting at port 1 are additive to the pressure setting at port 2.

Electric characteristics	Description, value, unit
Actuator type	solenoid coil
Solenoid coils type	D36
Supply voltage DC	12/24 V DC
Supply voltage tolerance	± 10 %
Control current	12 V = 0...1400 mA / 24 V = 0...750 mA
Nominal power consumption	27 W
Relative duty cycle	100 %
Coil resistance R	Cold value at 20° = 12 V = 5.8 Ω / 24 V = 21 Ω max. warm value = 12 V = 8.6 Ω / 24 V = 32 Ω
Response sensitivity with PWM	< 1 % I_N
Reproducibility with PWM	< 2 % p_N
Hysterese with PWM	2...4 % I_N
Reversal error with PWM	2...4 % I_N
Electrical connection coil	DIN EN 175301-803, 3-pole 2 P+E (IP 65)
Protection class solenoid coil to ISO 20 653 / EN 60 529	IP 65 / IP 67 / IP 69K, see “Ordering code” (with appropriate mating connector and proper fitting and sealing)

Performance graphs

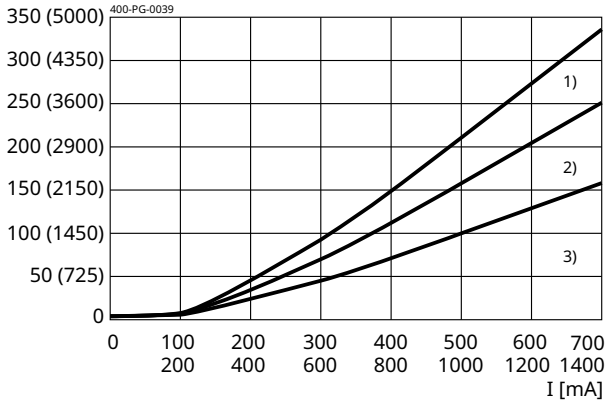
measured with oil viscosity 33.0 mm²/s (cSt)

p = f (I) Pressure adjustment



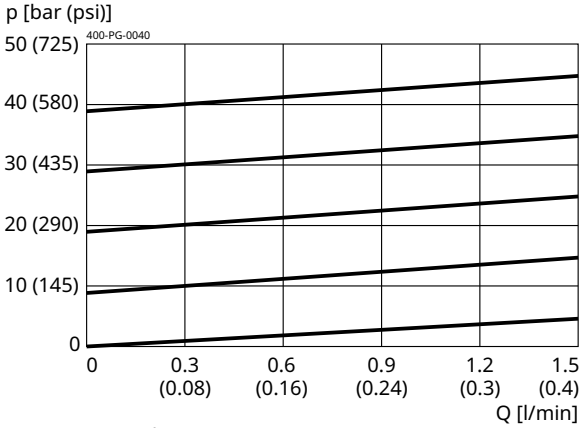
1) p_N 100 bar (1450 psi)
2) p_N 40 bar (580 psi)

p = f (I) Pressure adjustment



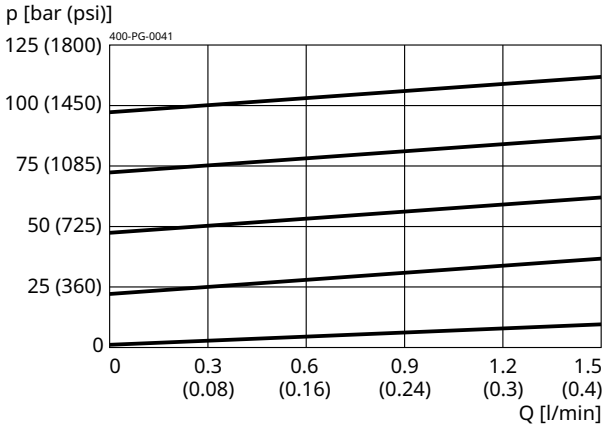
1) p_N 350 bar (5000 psi)
2) p_N 250 bar (3600 psi)
3) p_N 160 bar (2300 psi)

p = f (Q) Pressure-flow rate



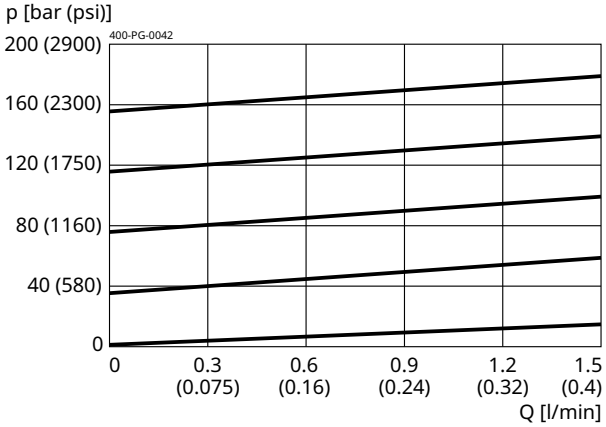
p_N = 40 bar (580 psi)

p = f (Q) Pressure-flow rate



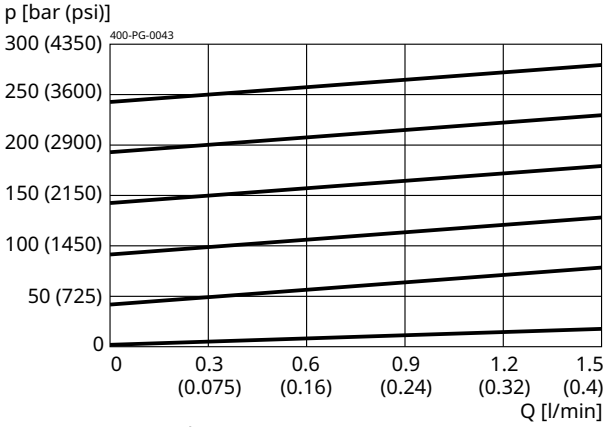
p_N = 100 bar (1450 psi)

p = f (Q) Pressure-flow rate



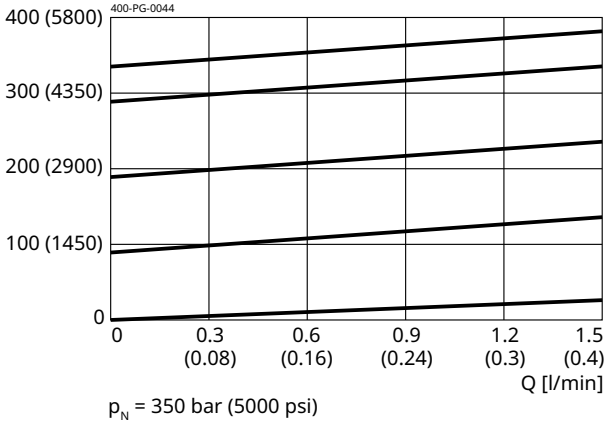
p_N = 160 bar (2300 psi)

p = f (Q) Pressure-flow rate



p_N = 250 bar (3600 psi)

p = f (Q) Pressure-flow rate

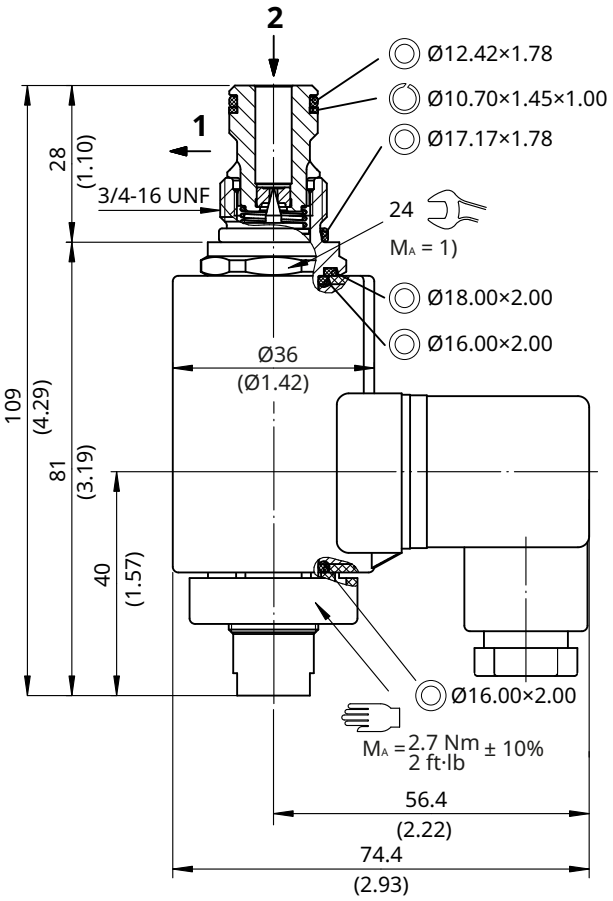


p_N = 350 bar (5000 psi)

Installation

Beispiel für die Masseinheit:
Example for the dimensional units:

0.79 = 0.79 mm millimeter
(.031) = 0.031'' inch



NOTE!
1) When fitting the screw-in cartridge valve, use the specified tightening torque. The value can be found in the chapter "Technical data".

IMPORTANT!
To achieve the screw-in valve's maximum performance rating, fit the solenoid coil as shown (with the plug pins nearest the valve body).

NOTE!
The seals are not available individually. The seal kit order number can be found in the chapter "Technical data".

ATTENTION!
Only qualified personnel with mechanical skills may carry out any maintenance work. Generally, the only work that should ever be undertaken is to check, and possibly replace, the seals. When changing seals, oil or grease the new seals thoroughly before fitting them.

Ordering code

Ex. D V S A - 1 L - 040 - 1 _ - 1 24 D _

D	=	pressure-control valve			
V	=	pilot operated			
S	=	electrically operated, D36			
A ... Q	=	standard model according to valid data sheet			
Z ... R	=	special model (on request)			
1	=	pressure relief (with internal control oil outlet)			
L	=	cavity type AL			
040	=	pressure range ... 40 bar			
100	=	pressure range ...100 bar			
160	=	pressure range ...160 bar			
250	=	pressure range ...250 bar			
350	=	pressure range ...350 bar			
1	=	nominal size 1 (primarily for pilot controls)			
(blank)	=	NBR (nitril-butadien-rubber / BUNA) seals **(standard)**			
V	=	FKM (fluorocarbon rubber / VITON) seals (special seals on request)			
1...9	=	technical design no. (omit by ordering)			
...	=	voltage e.g. 24 (24 V)			
D	=	current DC			
(blank)	=	DIN EN 175301-803 connection	3-pole 2 P+E **(standard)**	(IP 65)	with mating plug
T	=	DIN EN 175301-803 connection	3-pole 2 P+E, with protection diode	(IP 65)	with mating plug
M100	=	DIN EN 175301-803 connection	3-pole 2 P+E	(IP 65)	mating plug not supplied
J	=	Junior Timer plug connection	2-pole radial	(IP 65)	
JT	=	Junior Timer plug connection	2-pole radial, with protection diode	(IP 65)	
I	=	Junior Timer plug connection	2-pole axial	(IP 65)	
IT	=	Junior Timer plug connection	2-pole axial, with protection diode	(IP 65)	
D	=	Deutsch plug connection DT04-2P	2-pole 45°	(IP 67/69K)	
DT	=	Deutsch plug connection DT04-2P	2-pole 45°, with protection diode	(IP 67/69K)	
		other plug-variants, please consult BUCHER.			

IMPORTANT!
Not every combination of voltage values, current type and plug connections vailable.

Related data sheets

Reference	Description
400-P-040011	form tools
400-P-040171	cavity AL
400-P-120110	solenoid coil D36
400-P-720101	threaded port body GALA

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