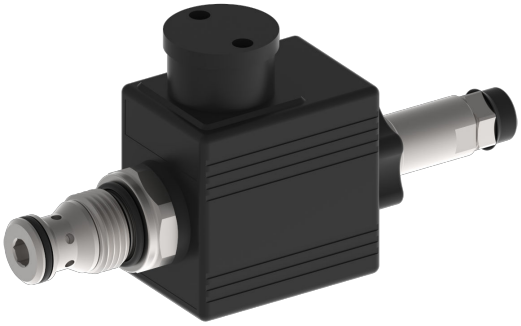
BUCHER hydraulics

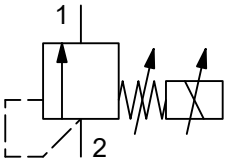
Pressure valve
Relief function

Q_{max} = 6 gpm, p_{max} = 5800 psi
Direct acting, spool type, proportional solenoid with emergency override
Type series: DBDTC-1LG-...



- 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
- Nominal pressure when solenoid de-energized (fail-safe function)
- With integral manual pressure setting
- Inverse-proportional design
- Large variety of plug connections
- High pressure wet-armature solenoids
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope

Symbol



Description

The inverse proportional pressure-relief valves, series DBDT_-1LG..., are size 2, direct acting screw-in valves of sliding-spool design with a falling pressure/current characteristic and a 3/4-16 UNF mounting thread. With these pressure-relief cartridges, the relief pressure is dependent on the electrical control signal and can be continuously varied. When the solenoid is de-energized (initial position), the relief pressure is the nominal pressure of the applicable spring range (failsafe function). 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 inversely 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), these valves are available in six spring ranges. If a proportional solenoid is faulty, for example, the integral manual pressure setting enables the required pressure to be set mechanically. All external parts of the screw-in 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 valves are predominantly used 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 with emergency override
Characteristic	direct acting, spool type
Construction size	NG 4
Thread size	3/4-16 UNF-2A
Mounting attitude	unrestricted (preferably vertical, coil down)
Weight	1.28 lb
Cavity acc. factory standard	AL
Tightening torque steel	30 ft·lb
Tightening torque aluminium	30 ft·lb
Tightening torque tolerance	± 10 %
Minimum ambient temperature	- 22 °F
Maximum ambient temperature	+ 140 °F
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-284-N / FKM: DS-284-V

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	5800 psi
Restriction of the operating pressure	port 1 = 3600 psi [1])
Maximum flow rate	6 gpm
Restriction of the flow rate	depending on the nominal pressure stage
Flow direction	see symbol
Hydraulic fluid	HL and HLP mineral oil according to DIN 51 524; other fluids on request!
Minimum fluid temperature	- 22 °F
Maximum fluid temperature	+ 158 °F
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 025: ...360 psi nominal pressure range 063: ...915 psi nominal pressure range 100: ...1450 psi nominal pressure range 160: ...2300 psi nominal pressure range 230: ... 3350 psi nominal pressure range 350: ... 5000 psi
Internal leakage flow rate	nominal pressure range 025: ...0.03 gpm nominal pressure range 063: ...0.03 gpm nominal pressure range 100: ...0.05 gp nominal pressure range 160: ...0.07 gpm nominal pressure range 230: ...0.08 gpm nominal pressure range 350: ...0.11 gpm

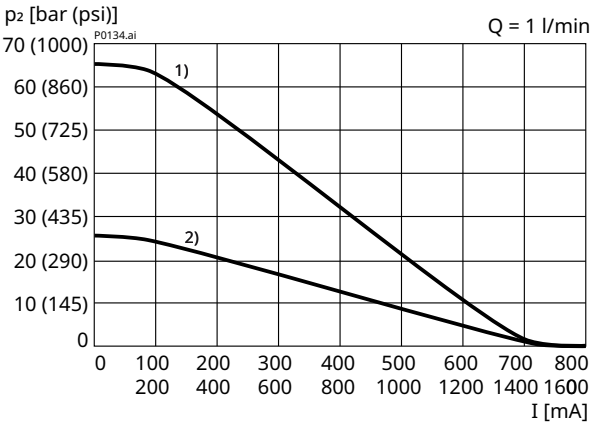
NOTE!
[1]) Please note that any tank or return-line pressures acting at port 1 are additive to the pressure setting at port 2.

Electric characteristics	Description, value, unit
Actuator type	solenoid coil
Solenoid coils type	36X48/16.1
Supply voltage DC	12/24 V DC
Control current	12 V = 0...1600 mA / 24 V = 0...800 mA
Nominal power consumption	17.5 W
Switching time	6 ... 90 ms (Solenoid ON) 6 ... 20 ms (Solenoid OFF) These times are strongly influenced by fluid pressure, flow rate and viscosity, as well as by the dwell time under pressure
Relative duty cycle	100 %
Coil resistance R	cold value at 68°F = 12 V = 4.35 Ω / 24 V = 17.2 Ω max. warm value = 12 V = 6.8 Ω / 24 V = 26.9 Ω
Recommended PWM frequency	200 Hz
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

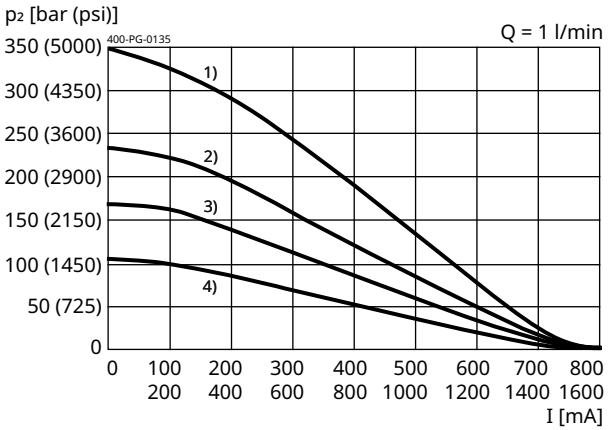
measured with oil viscosity 33.0 mm²/s (cSt)

p = f (I) Pressure adjustment



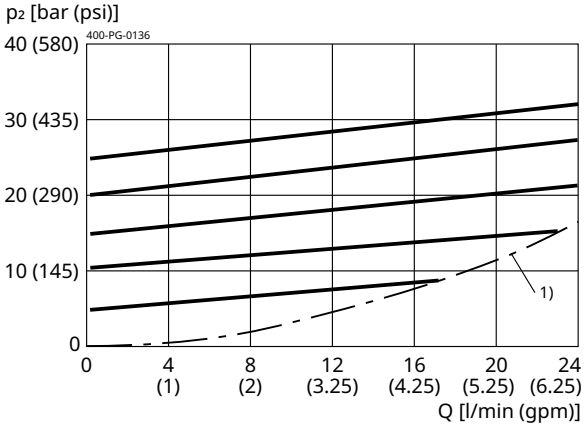
1) = p_N 63 bar (915 psi)
2) = p_N 25 bar (360 psi)

p = f (I) Pressure adjustment



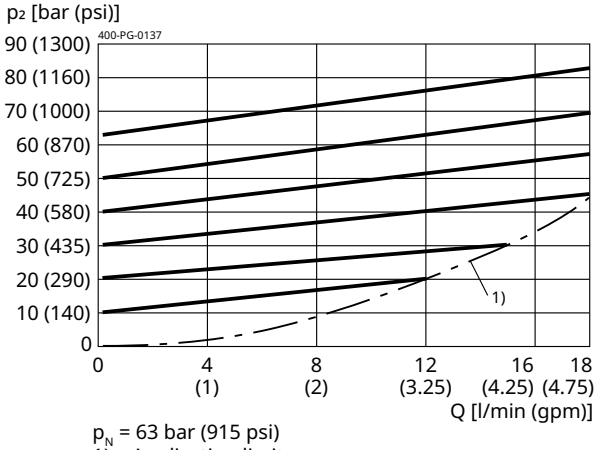
1) = p_N 350 bar (5000 psi)
2) = p_N 230 bar (3350 psi)
3) = p_N 160 bar (2300 psi)
4) = p_N 100 bar (1450 psi)

p = f (Q) Pressure-flow rate



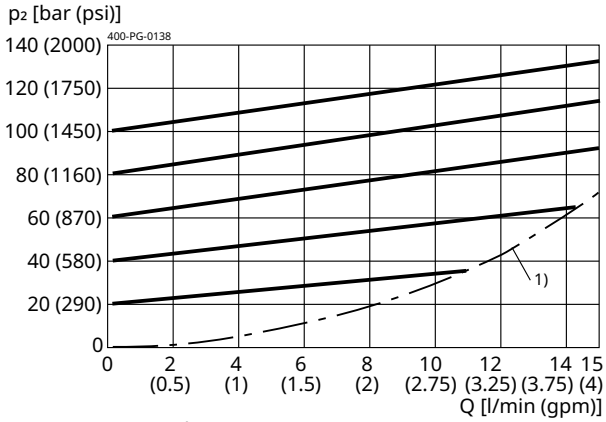
p_N = 25 bar (360 psi)
1) = Application limit

p = f (Q) Pressure-flow rate



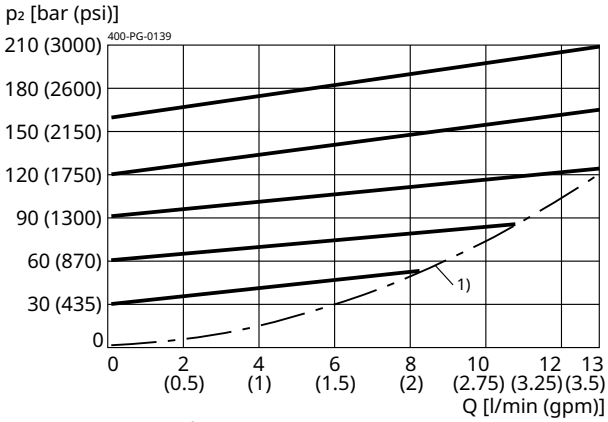
p_N = 63 bar (915 psi)
1) = Application limit

p = f (Q) Pressure-flow rate



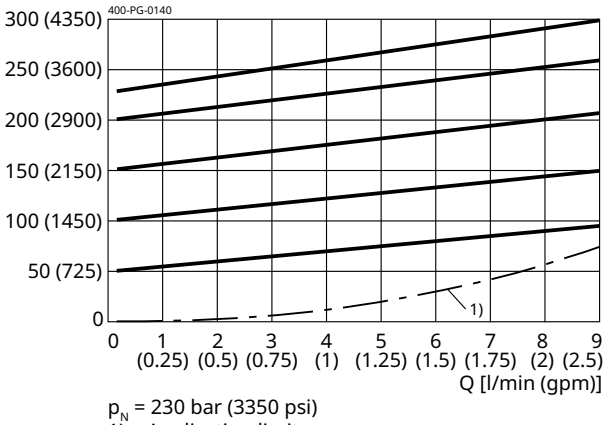
p_N = 100 bar (1450 psi)
1) = Application limit

p = f (Q) Pressure-flow rate



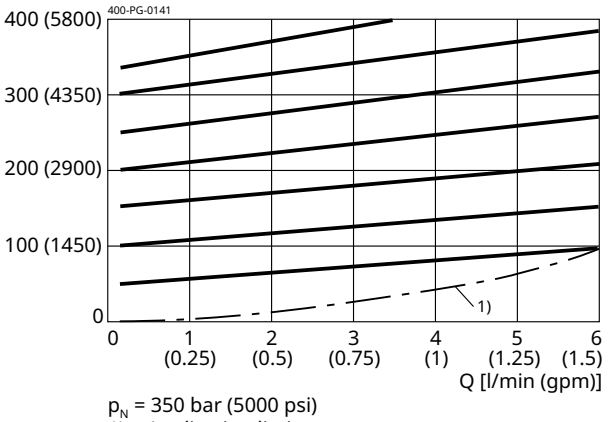
p_N = 160 bar (2300 psi)
1) = Application limit

p = f (Q) Pressure-flow rate



p_N = 230 bar (3350 psi)
1) = Application limit

p = f (Q) Pressure-flow rate

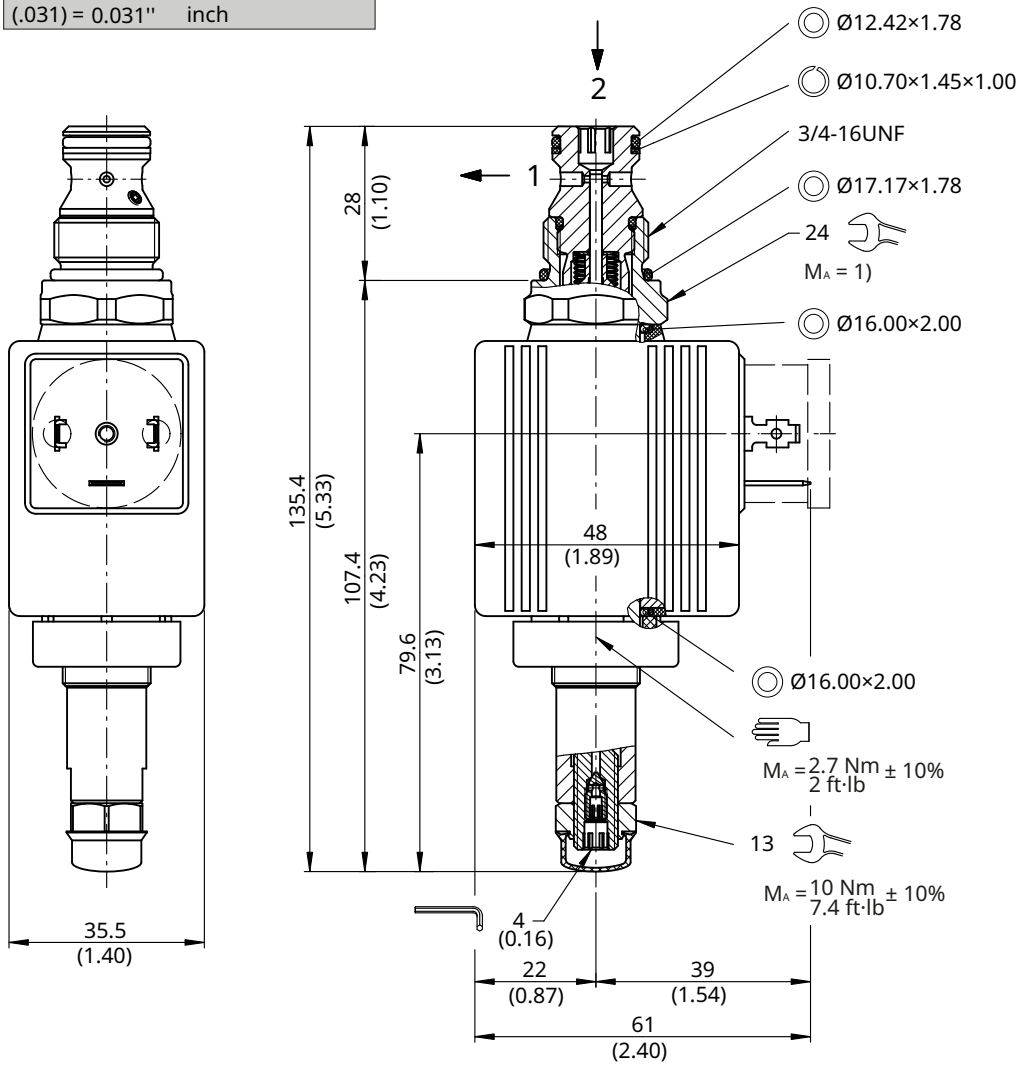


p_N = 350 bar (5000 psi)
1) = Application limit

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".

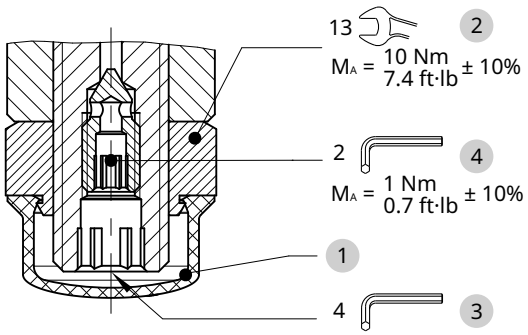
IMPORTANT!
To achieve the screw-in valve's maximum performance rating, fit the solenoid coil as shown (with the plug pins nearest the valve body). The valve must be installed in a steel body.

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.

Emergency pressure setting

Optionally, the proportional pressure screw-in cartridge valves can be supplied with an integral manual emergency pressure setting. If a proportional solenoid is faulty, for example, this manual pressure setting enables the required pressure to be set mechanically up to max. 60% of the nominal pressure. The manual pressure setting is not designed for adjusting the pressure in a dynamic control mode. The following steps must be observed.

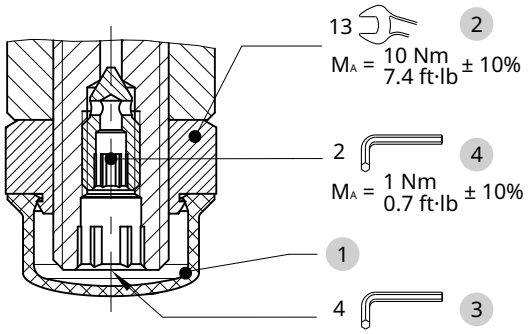


1. Remove the protective cap 1
2. Loosen the lock nut 2
3. Screw-in (turn to right) the adjusting spindle 3 until the required pressure is set.
4. Tighten the lock nut 2 to the specified torque.
5. Fit the protective cap 1

NOTE!
Any changes to the emergency pressure setting have a direct impact on the factory setting.

Reset to factory settings

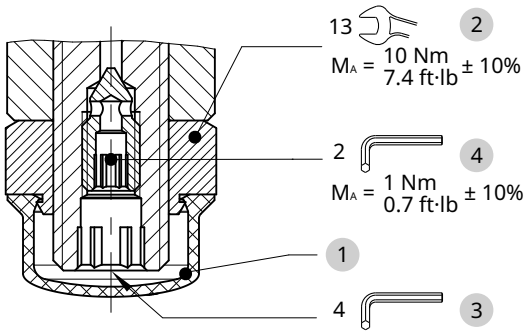
To reset the proportional pressure-relief cartridges to their initial position (the factory setting), a constant flow rate and a pressure gauge that measures the pressure in the input port are needed. The pressure setting must not exceed the nominal pressure of the spring range in use. The following steps must be observed.



1. Ensure that the solenoid coil is de-energized
2. Remove the protective cap 1
3. Loosen the lock nut 2
4. Unscrew the adjusting spindle 3 to its end-stop
5. Screw-in the adjusting spindle 3 until the pressure on the gauge reaches the nominal pressure (pN) of the spring range in use
6. Tighten the lock nut 2 to the specified torque
7. Fit the protective cap 1

Air-bleeding

The integrated air-bleed screw allows the proportional pressure valves to be vented if necessary. If the screw-in valve is mounted as preferred (solenoid-coil hanging), it is self-venting. To vent the valve manually, follow the steps below.



1. Remove the protective cap 1
2. Loosen the air-bleed screw 4 approx. 2 turns
3. Switch the valve ON/OFF several times until no more air bubbles escape
4. Tighten the air-bleed screw 4 to the specified torque
5. Fit the protective cap 1

Ordering code

Ex. D B D T C - 1 L G - 025 - 4 _ - 1 24 D _ _

D	=	pressure-control valve
B	=	pressure-control valve
D	=	direct acting
T	=	electrically operated, COIL 36X48, proportional
C ... 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
G	=	proportional solenoid, inverse type (pulling)
025	=	pressure range ... 25 bar
063	=	pressure range ... 63 bar
100	=	pressure range ... 100 bar
160	=	pressure range ... 160 bar
230	=	pressure range ... 230 bar
350	=	pressure range ... 350 bar
2	=	nominal size 2 for pressure ranges 350 and 230
3	=	nominal size 3 for pressure ranges 160 and 100
4	=	nominal size 4 for pressure ranges 063 and 025
(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
G	=	DIN EN 175301-803 connection — 3-pole 2 P+E **(standard)** — (IP 65)
GR	=	DIN EN 175301-803 connection — 3-pole 2 P+E, with protection diode — (IP 65)
J	=	Junior Timer plug connection — 2-pole radial — (IP 65)
JR	=	Junior Timer plug connection — 2-pole radial, with protection diode — (IP 65)
U	=	Deutsch plug connection DT04-2P — 2-pole radial — (IP 67/69K)
UR	=	Deutsch plug connection DT04-2P — 2-pole radial, with protection diode — (IP 67/69K)
		other plug-variants, please consult BUCHER.
(blank)	=	connection without mating plug **(standard)**
Q	=	only connection “G“ and “GR“ with mating plug

mating plug not supplied

IMPORTANT!
Not every combination of voltage values and plug connections available.

Related data sheets

Reference	Description
400-P-040011	form tools
400-P-040171	cavity AL
400-P-120112	solenoid coil 36X48-161
400-P-720101	threaded port body GALA

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