

# Double Pressure-Relief Cartridge Valve, Size 16

$Q_{max} = 400 \text{ l/min (105 gpm)}$ ,  $p_{max} = 420 \text{ bar (6000 psi)}$   
hydraulically pilot operated seat valve, double-shock valve  
Series DDP 16...



- Compact design for cavity type according to Bucher standard – M30x1.5
- Double shock valve in a cartridge
- Pressure protection of two working ports
- Two conventional pressure relief valves can be replaced by this valve type
- Embossed seat section and hardened cones
- Optionally available with common pressure setting or with separate adjustable pressure setting
- Suitable body with thread or flange connection available on request

## 1 Description

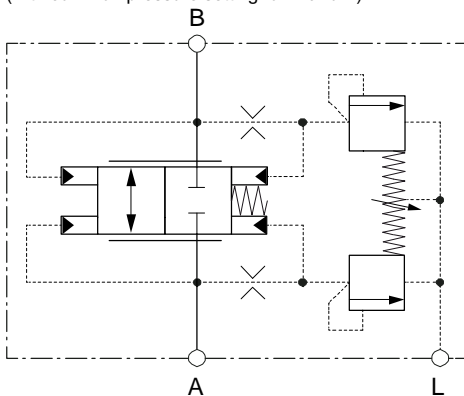
These double pressure-relief cartridge valves are size 16, pilot-operated, high performance screw-in cartridges with an M30x1.5 mounting thread. The flat opening curve and high reproducibility are the main features of this cartridge. Due to the special construction, the cartridge can replace two con-

ventional pressure relief valves. The screw-in cartridges are mainly used in mobile and stationary applications for primary protection in closed circuits or for secondary protection when both sides have to be protected with the same pressure or with different pressures.

## 2 Symbol

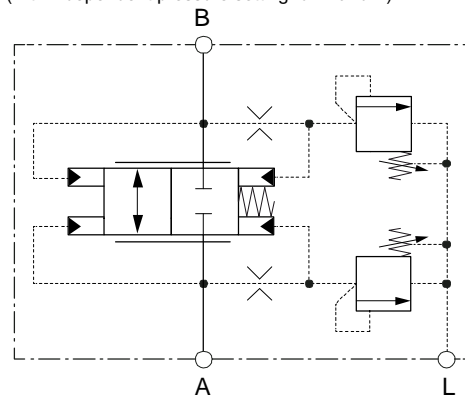
### Design E

(with common pressure setting for A and B)



### Design D

(with independent pressure setting for A and B)



## 3 Technical data

General characteristics	Description, value, unit
Designation	double pressure-relief cartridge valve
Design	hydraulically pilot operated seat valve, double-shock valve
Mounting method	screw-in cartridge – M30x1.5
Tightening torque	100 Nm ± 8 % (75 ft-lbs ± 8 %)
Size	size 16

General characteristics	Description, value, unit	
Weight	0.6...0.8 kg	(1.32...1.76 lbs)
Mounting attitude	unrestricted	
Ambient temperature range	-25 °C ... +80 °C	(-13 °F ... +176 °F)
Surface corrosion protection	without	

Hydraulic characteristics	Description, value, unit	
Maximum operating pressure	420 bar	(6000 psi)
Maximum flow rate	400 l/min	(105 gpm)
Flow direction	A → B, B → A, see symbol	
Pressure adjustment range	min: Q-dependent → see characteristics max: 480 bar	
Hydraulic fluid	HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER	
Hydraulic fluid temperature range	-20 °C ... +80 °C	(-4 °F ... +176 °F)
Temperature rating of seals	NBR FKM MIL	-25 °C ... +100 °C (-13 °F ... +212 °F) -20 °C ... +200 °C (-4 °F ... +392 °F) -55 °C ... +80 °C (-67 °F ... +176 °F)
Viscosity range	2.8...1500 mm <sup>2</sup> /s (cSt), recommended 10...380 mm <sup>2</sup> /s (cSt)	
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999	class 20/18/15	

## 4 Construction and function

### 4.1 Design E (with common pressure setting for A and B)

#### 4.1.1 Neutral position (the load pressure at A and B are below the pressure setting)

The pilot cones are held in their closed position by the compression spring. The spool remains in the closed position.

#### 4.1.2 Relieving pressure (at the pressure setting)

When the adjusted pressure at A or B is exceeded, the corresponding pilot cone opens against the compression spring. The control oil flows from the spring chamber to the leakage oil connection L. Due to the resulting one-sided force conditions at the spool, the spool opens and the oil can flow from A → B respectively from B → A.

#### 4.1.3 Valve closure

When the pressure at A or B falls back below the valve setting, the corresponding pilot cone closes and the spool is returned to the closed position by the hydraulic forces and the compression spring. The connection from A → B or B → A is again closed.

### 4.2 Design D (with independent pressure setting for A and B)

The functions are the same as for version E, but the pilot cones can be adjusted to different pressure values via a separate compression spring.

## 5 Performance graphs

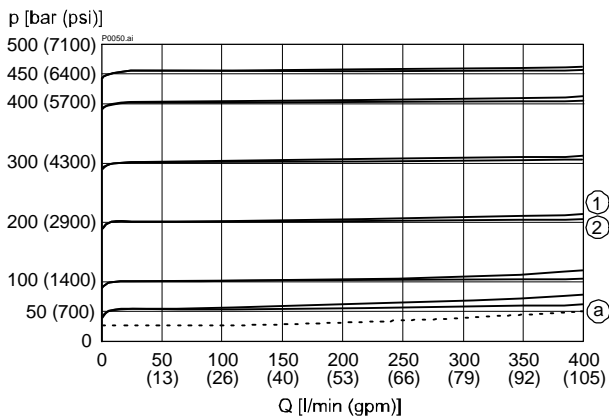
measured with oil viscosity 33 mm<sup>2</sup>/s (cSt)

$p = f(Q)$  Pressure - Flow rate characteristic



**IMPORTANT!:**

$p$  = effective setting pressure



a	$p_{min}$
1	A → B
2	B → A

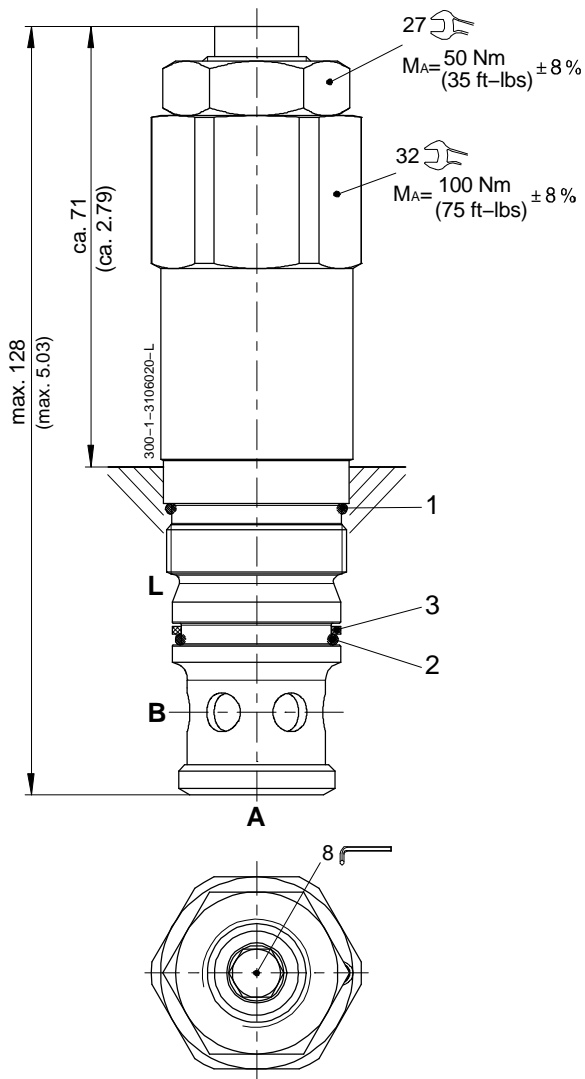
## 6 Dimensions & sectional view

Example for the dimensional units:

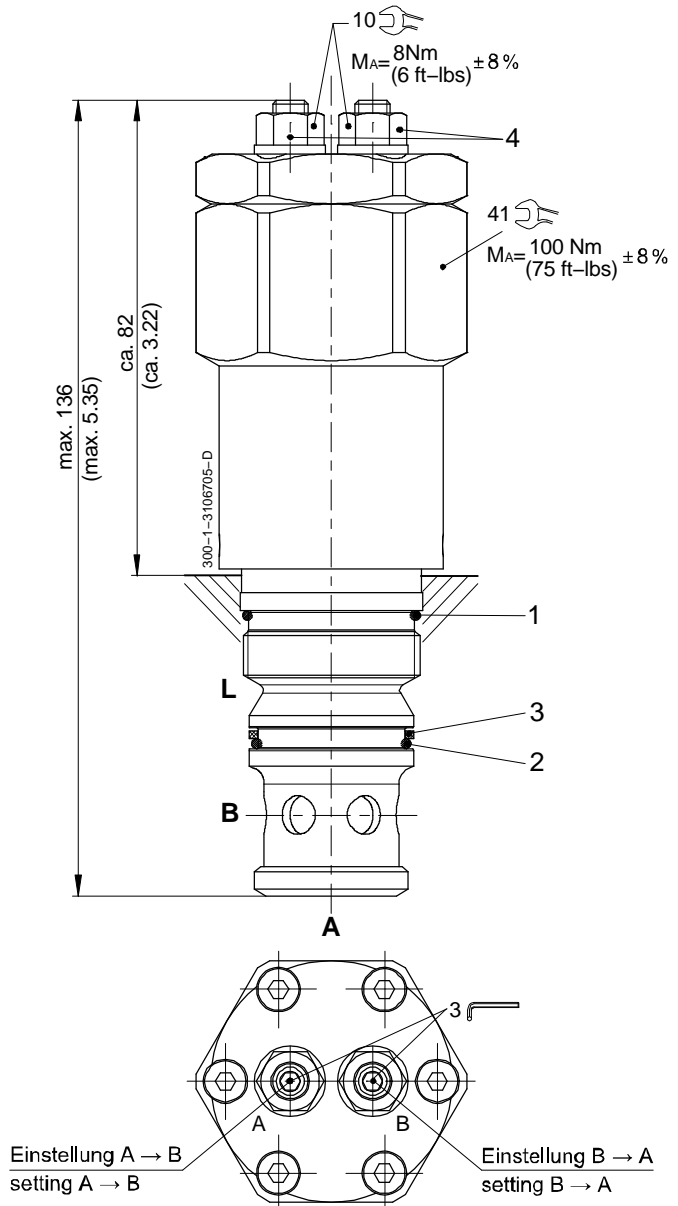
0.79 = 0.79 mm [millimeter]

(.031) = 0.031" [inch]

DDP 16 / E / ...



DDP 16 / D / ...



Item	Qty.	Description
1	1	O-Ring $\varnothing 26.70 \times 1.78$
2	1	O-Ring $\varnothing 23.52 \times 1.78$
3	1	Backup ring $\varnothing 28.00 / 25.10 \times 1.30$



### IMPORTANT!

Item No. 30003005470 = seal kit NBR (Nitril)  
 Item No. 3000300548 = seal kit FKM (Viton)  
 Item No. 3000301012 = seal kit MIL (low temp.)

Item	Qty.	Description
1	1	O-Ring $\varnothing 26.70 \times 1.78$
2	1	O-Ring $\varnothing 23.52 \times 1.78$
3	1	Backup ring $\varnothing 28.00 / 25.10 \times 1.30$
4	2	Seal-Lock sealing nut M6



### IMPORTANT!

Item No. 3000300957 = seal kit NBR (Nitril)  
 Item No. 3000301001 = seal kit FKM (Viton)  
 Item No. 3000301013 = seal kit MIL (low temp.)

## 7 Installation information



### IMPORTANT!:

The valve may only be used for its intended purpose within its nominal rating. If you plan to use it outside the nominal rating, you must contact the valve manufacturer.



### IMPORTANT!:

When fitting the cartridges, use the specified tightening torque. No adjustments are necessary, since the cartridges are set in the factory.



### 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.

### 7.1 Adjustment instructions



### IMPORTANT!:

The cartridge may only be adjusted by qualified personnel.

Pressure increase: clockwise  
 Pressure reduction: counter-clockwise  
 Rate of pressure change: Design D: 250 bar per rotation  
 Design E: 350 bar per rotation

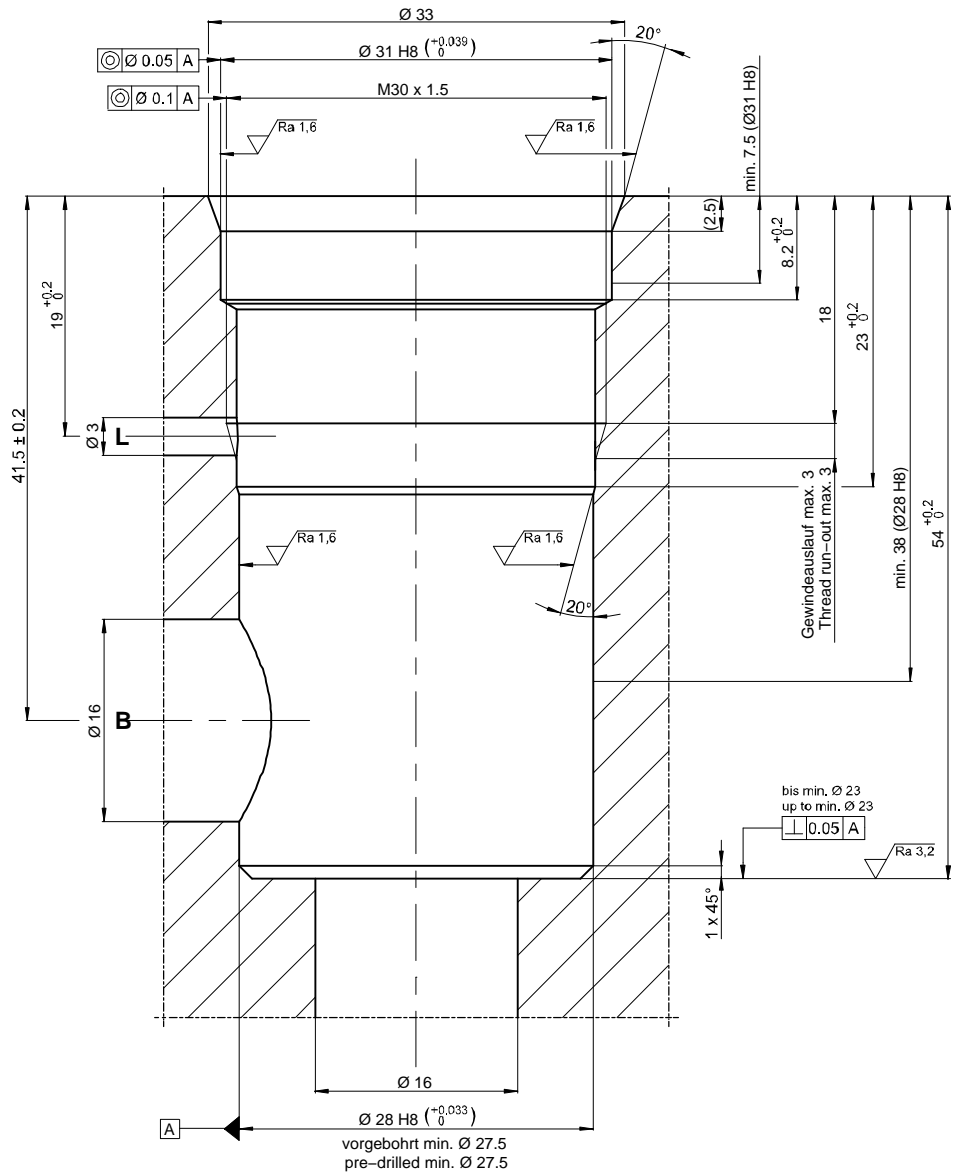
After making an adjustment, always secure the adjusting screw with the lock nut to prevent drift.  
 (see chapter 6, dimensional & section view).

## 8 Ordering code

DDP 16 / D / N / ... / ...

- DDP = double pressure-relief cartridge valve
- 16 = size 16
- D = with independent pressure setting for A and B
- E = with common pressure setting for A and B
- N = NBR (Nitrile) seals (standard)
- V = FKM (Viton) seals
- T = MIL (low temperature) seals  
(special seals - please contact BUCHER)
- ... = setting value variant D: ...480 bar (A → B)
- ... = setting value variant E: ...480 bar (A → B, B → A)
- ... = setting value variant D: ...480 bar (B → A)

## 9 Cartridge cavity



Toleranzen nach:  
Tolerances according to: DIN ISO 2768-mK

	$\sqrt{Ra\ 1,6}$	$\sqrt{Ra\ 3,2}$	$\sqrt{Ra\ 6,3}$
Rauheitsklasse Roughness class	N7	N8	N9
Rz [ $\mu\text{m}$ ]	10	20	40



### ATTENTION!

You must maintain the specified positional and diametral tolerances. To ensure trouble-free operation of the screw-in cartridges, we strongly recommend that pilot drilling, boring, reaming and cavity thread-cutting are always performed in one setup.

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Classification: 430.305.300.305.340.305.310