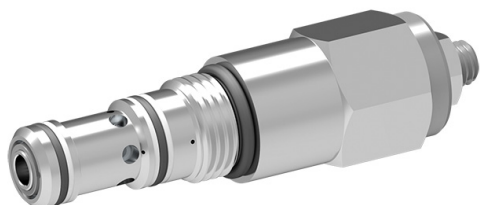


# Counterbalance Valve, Poppet Type, SAE 10 / NG 8

$Q_{max} = 15.0 \text{ gpm (60 l/min)}$ ,  $p_{max} = 5000 \text{ psi (350 bar)}$   
direct acting, pilot assisted, poppet type, non-vented, adjustable  
Series CBPP-10... / CBPP-20M...



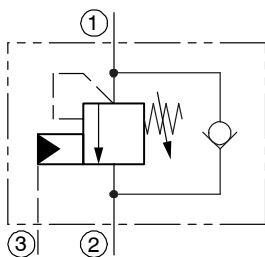
- Leak free and smooth-running pressure adjustment
- Adjustment screw can not be backed out of the valve
- Overset protection - spring can not go solid
- Hardened precision fitted piston & poppet provide reliable, long life
- A unibody adapter cage construction provides very reliable operation
- Low hysteresis - pilot piston not sealed towards the spring chamber
- Can be fitted in a line-mounting body

## 1 Description

The Counterbalance Valve model series CBPP... is a differential area, direct acting, screw in cartridge style, non-vented, poppet type, adjustable, pilot assisted, hydraulic counterbalance valve with thread 7/8-14 UNF (CBPP-10...) or 20 x 1.5 mm (CBPP-20M...) are size SAE 10 / NG 8. This valve controls a moving load, preventing it from running ahead of the pump. Locking the load in any position, it also provides static overload and thermal expansion protection. This valve is a modulating device that allows free flow from

port 2 to port 1, then blocks reverse flow until a pilot pressure inversely proportional to the load pressure is sensed at port 3 modulating flow from port 1 to port 2. Back pressure at port 2 adds to the spring setting (pilot ratio +1) x back pressure. All external parts of the cartridge are zinc plated and chromited (CrVI-free). If you intend to manufacture your own cavities or are designing a line-mounting installation, please refer to the section "Related data sheets".

## 2 Symbol



## 3 Technical data

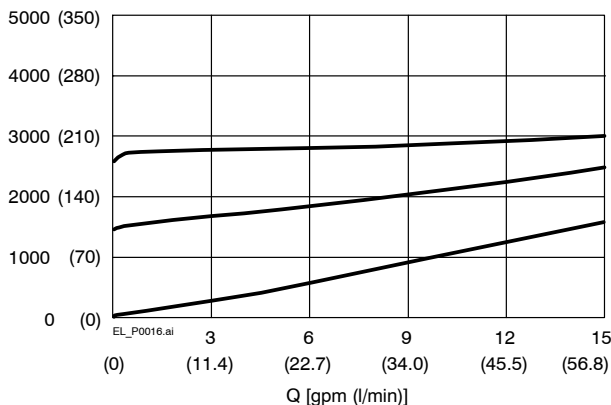
General characteristics	Description, value, unit
Designation	counterbalance valve, non-vented
Design	poppet type, free reverse flow, pilot assisted
Mounting method	screw-in cartridge 7/8-14 UNF-2A or M20 x 1.5 mm
Size	SAE 10 / NG 8, cavity type C1025 or T-11A
Weight	0.62 lbs (0.28 kg)
Mounting attitude	design B: unrestricted design S,C,T: hanging or horizontal mounting position
Ambient temperature range	-40 °F ... +250 °F (-40 °C ... +120 °C)

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	5000 psi (350 bar)
Maximum flow rate <span style="float: right;">Standard</span>	15.0 gpm (60 l/min)
Nominal pressure ranges	1500, 3000, 5000 psi (100, 210, 350 bar) For further pressure ranges, please contact BUCHER
Pilot Ratio	2.3, 3.0, 4.5 to 1 – 1.5 and 10 to 1 on request For further pilot ratios, please contact BUCHER
Leakage flow rate	5 drops/min. @ 80 % of crack pressure
Definition of Crack	evident at 0.06 gpm (0,25 l/min)
Hydraulic fluid	Mineral-based or synthetics with lubricating properties. HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER
Hydraulic fluid temperature range	-13 °F ... +175 °F (-25 °C ... +80 °C)
Viscosity range	10...500 mm <sup>2</sup> /s (cSt), recommended 15...250 mm <sup>2</sup> /s (cSt)
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999	class 20/18/15

#### 4 Performance graphs [measured with oil viscosity 33 mm<sup>2</sup>/s (cSt)]

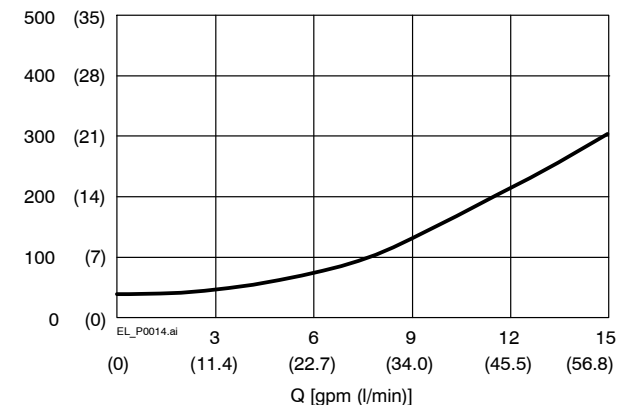
$\Delta p = f(Q)$  Relief Characteristic [pw = 5000 psi]  
unrestricted \*\*\*

$\Delta p$  [psi (bar)]



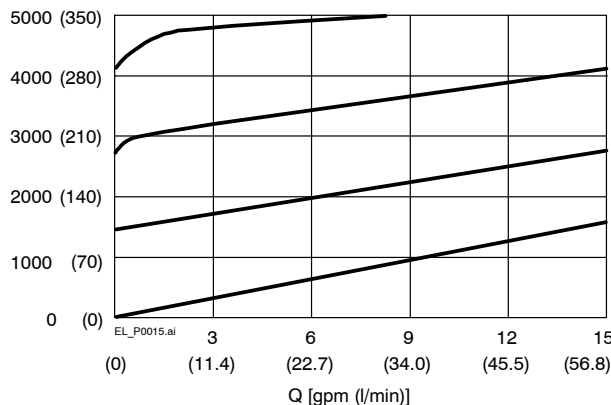
$\Delta p = f(Q)$  Pressure drop - Flow rate characteristic  
unrestricted \*\*\*

$\Delta p$  [psi (bar)]



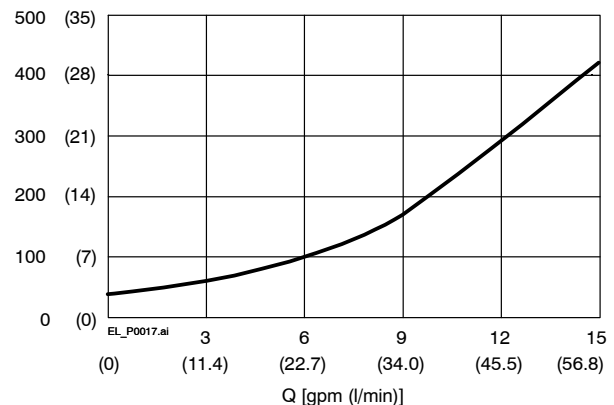
$\Delta p = f(Q)$  Relief Characteristic [pw = 5000 psi]  
restricted

$\Delta p$  [psi (bar)]



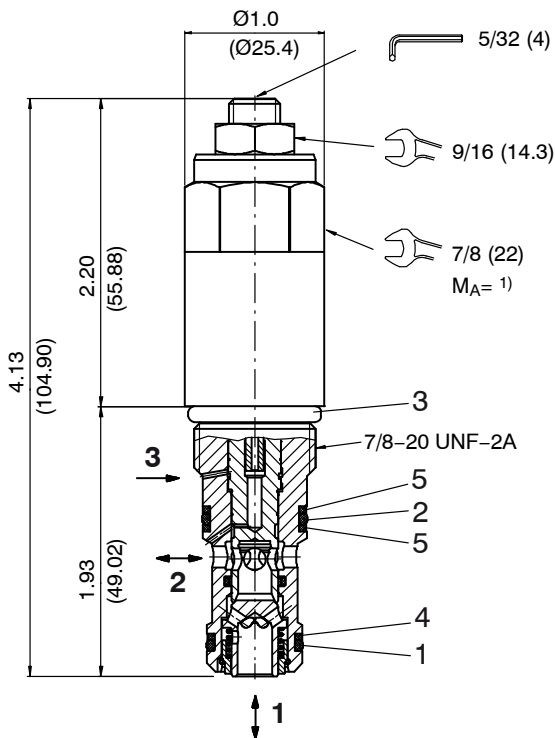
$\Delta p = f(Q)$  Pressure drop - Flow rate characteristic  
restricted

$\Delta p$  [psi (bar)]

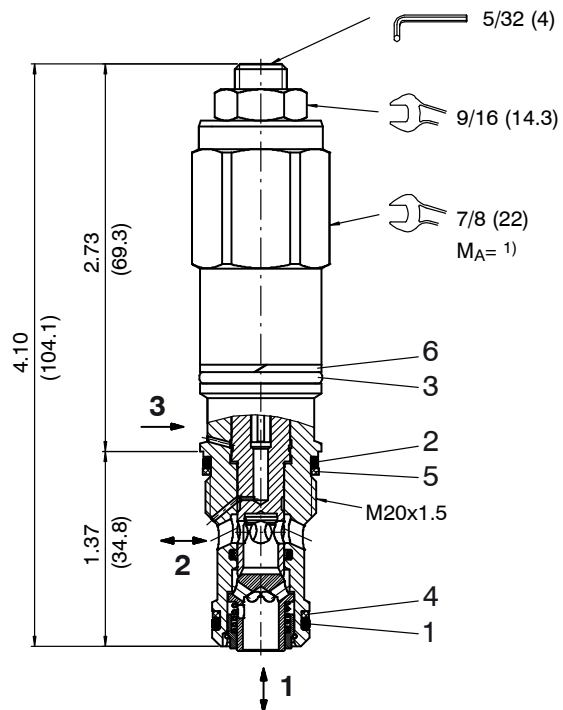


## 5 Dimensions & sectional view

### 5.1 Insertion in cavity type "C1025"



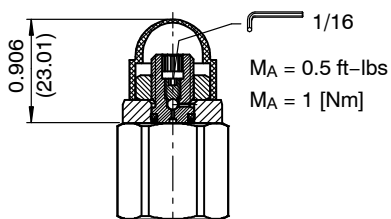
### 5.2 Insertion in cavity type "T-11A"



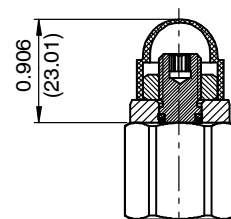
Tightening torque  $M_A$  <sup>1)</sup>

Cavity type	C1025		T-11A	
When fitted in steel	55...60 ft-lbs	75...81 [Nm]	30...35 ft-lbs	40...47 [Nm]
When fitted in aluminum	35...40 ft-lbs	47...54 [Nm]	30...35 ft-lbs	40...47 [Nm]

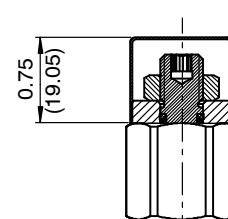
Air bleeding with capped adjustment screw "B"



With capped adjustment screw "C" \*\*



Adjusting screw with tamper-proof cap "T" \*\*  
(order separately in plain language)



\*\* recommended hanging or horizontal mounting position only.

### 6 Installation information

Seal kit NBR Nr. SKN-1028 <sup>2)</sup>

Item	Qty.	Description
1	1	O-ring no. 910 $\varnothing$ 0.755 x 0.097 N90
2	1	O-ring no. 016 $\varnothing$ 0.614 x 0.070 N70
3	1	O-ring Nr. 015 $\varnothing$ 0.551 x 0.070 N70
4	2	Backup ring $\varnothing$ 0.643 x 0.053 x .048
5	1	Backup ring $\varnothing$ 0.580 x 0.053 x .048



**IMPORTANT!**

<sup>2)</sup> Seal kit SKV-1028 (Viton "V")

Item no. 5207300016 = Seal kit NBR (Buna)

Item no. 5207300065 = Seal kit FKM (Viton)

Seal kit NBR Nr. SKN-1029 <sup>3)</sup>

Item	Qty.	Description
1	1	O-ring Nr. 015 $\varnothing$ 0.551 x 0.070 N70
2	1	O-ring no. 016 $\varnothing$ 0.614 x 0.070 N70
3	1	O-ring no. 017 $\varnothing$ 0.676 x 0.07 N70
4	1	Backup ring $\varnothing$ 0.580 x 0.053 x .048
5	2	Backup ring $\varnothing$ 0.697 x 0.052 x .047
6	2	Backup ring $\varnothing$ 0.750 x 0.054 x .048



**IMPORTANT!**

<sup>3)</sup> Seal kit SKV-1029 (Viton "V")

Item no. 52073000.. = Seal kit NBR (Buna)

Item no. 5207300066 = Seal kit FKM (Viton)



**IMPORTANT!**

When fitting the cartridges, use the specified tightening torque. The recommended relief pressure setting is 30 % above operating pressure.



**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 Ordering code

Ex. CBPP - 10 - N - S - 0 - 3.0 - 50 / - A

CBPP	= counterbalance, non-vented, pilot assisted	
10	= size SAE 10 / NG 8, cavity C1025	
20M	= size SAE 10 / NG 8, cavity T-11A *	
N	= NBR (Nitrile) seals (standard)	
V	= FKM (Viton) seals (special seals - please consult BUCHER)	
S	= adjustment screw **	
C	= capped adjustment screw **	
T	= tamperproof adjustment screw **	
B	= air bleeding with capped adjustment screw	
0	= cartridge only (standard) *	
03BA	= line-mounting body G3/8 BSPP	aluminum
03BS	= line-mounting body G3/8 BSPP	steel
04BA	= line-mounting body G1/2 BSPP	aluminum
04BS	= line-mounting body G1/2 BSPP	steel
08TA	= line-mounting body SAE-#8	aluminum
08TS	= line-mounting body SAE-#8	steel
10TA	= line-mounting body SAE-#10	aluminum
10TS	= line-mounting body SAE-#10	steel
1.5	= pilot ratio 1.5 : 1 (on request)	
2.3	= pilot ratio 2.3 : 1	
3.0	= pilot ratio 3.0 : 1	
4.5	= pilot ratio 4.5 : 1	
10	= pilot ratio 10 : 1 (on request)	
15	= pressure range 500 - 1500 psi ( 35 - 103 bar)	
30	= pressure range 1000 - 3000 psi ( 70 - 207 bar)	
50	= pressure range 1500 - 5000 psi (103 - 345 bar) (standard)	
without	= without pressure setting (standard)	
...	= pressure setting in 100 psi steps (setting value 100 psi = /1 or 500 psi = /5)	
A	= opening pressure check valve 20 psi (1.4 bar) ***	
B	= opening pressure check valve 5 psi (0.4 bar) ***	
C	= opening pressure check valve 20 psi (1.4 bar), restricted (standard)	
D	= opening pressure check valve 5 psi (0.4 bar), restricted	

- \* Cavity T-11A available as cartridge only. (no line-mounting body available)  
 \*\* recommended hanging or horizontal mounting position only.  
 \*\*\* recommended up to 3000 psi or non-overcenter applications only.

## 8 Related data sheets

Reference	(Old no.)	Description
520-P-000050		Form tools
520-P-000220	(0-022.0)	Cavity type C1025
520-P-000221	(0-022.1)	Line-mounting body, 10 Series – 2.5-way (with C1025)

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www.bucherhydraulics.com/commoncavity

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