

Counterbalance Valve, Poppet Type, SAE 10

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



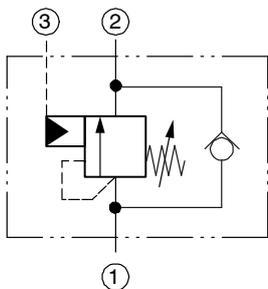
- Leak proof internal screw adjustment
- Adjustment screw can not be backed out of the valve
- Overset protection - spring can not go solid
- Hardened precision fitted piston & poppet provide reliable, long life
- A unibody adapter cage construction provides very reliable operation
- Non-sealed pilot piston
- 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...). 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 or M20 x 1.5 mm
Size	SAE 10, cavity type C1025 / T-11A
Weight	0.62 lbs (0.28 kg)
Mounting attitude	unrestricted
Ambient temperature range	-40 °F ... +250 °F (-40 °C ... +120 °C)

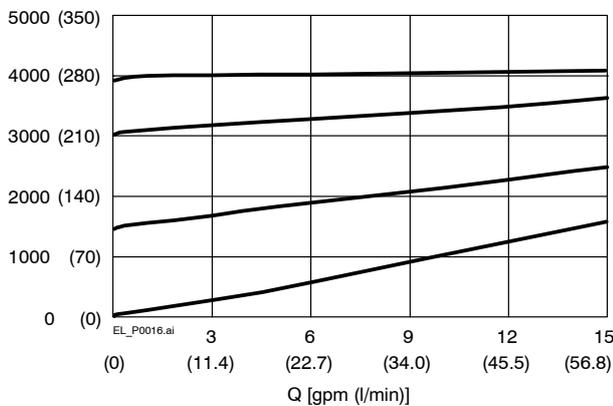
Hydraulic characteristics	Description, value, unit	
Maximum operating pressure	5000 psi	(350 bar)
Maximum flow rate	Standard 15.0 gpm	(60 l/min)
Nominal pressure ranges	1500, 3000, 5000 psi	(100, 210, 350 bar)
	For further pressure ranges, please contact BUCHER	
Pilot Ratio	1.5, 2.3, 3.0, 4.5, 10.0 to 1	
	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 ² /s (cSt), recommended 15...250 mm ² /s (cSt)	
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999	class 20/18/15	

4 Performance graphs

[measured with oil viscosity 33 mm²/s (cSt)]

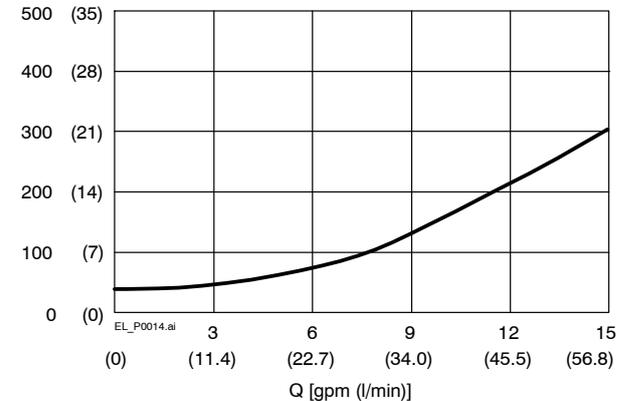
$\Delta p = f(Q)$ Relief Characteristic [pw = 5000psi]
unrestricted

Δp [psi (bar)]



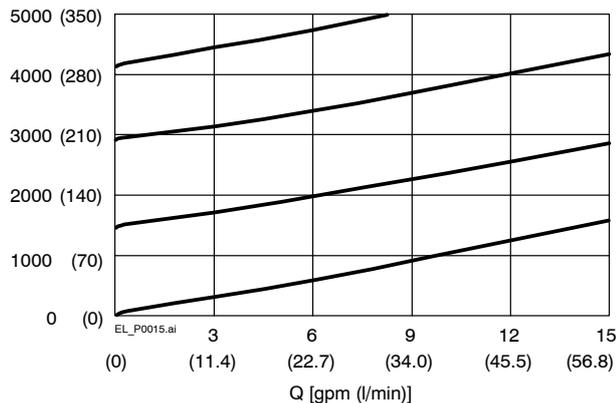
$\Delta p = f(Q)$ Pressure drop - Flow rate characteristic
unrestricted

Δp [psi (bar)]



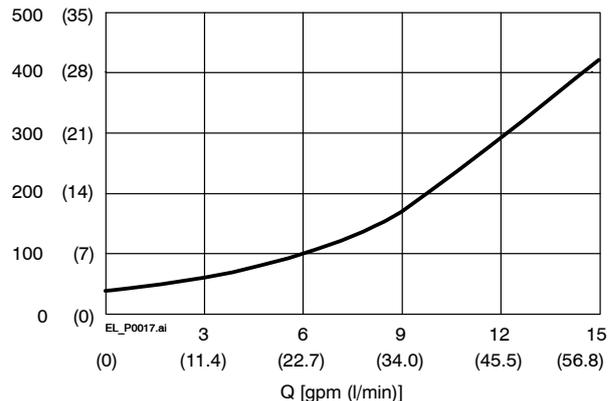
$\Delta p = f(Q)$ Relief Characteristic [pw = 5000psi]
restricted

Δp [psi (bar)]



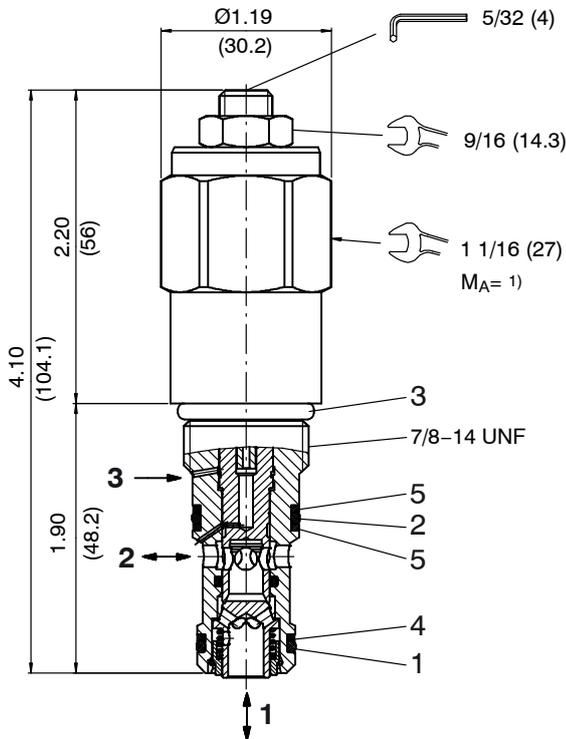
$\Delta p = f(Q)$ Pressure drop - Flow rate characteristic
restricted

Δp [psi (bar)]

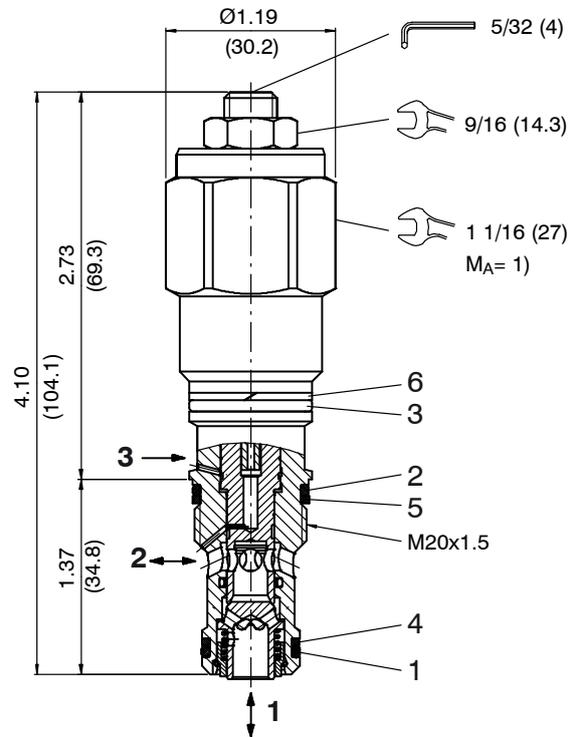


5 Dimensions & sectional view

5.1 Insertion in cavity type "C1025"



5.2 Insertion in cavity type "T-11A"



Tightening torque M_A ¹⁾

Cavity type	C0125		T-11A	
When fitted in steel	50...60 ft-lbs	75...80 [Nm]	T.b.d.	T.b.d.
When fitted in aluminum	35...40 ft-lbs	47...54 [Nm]	30...35 ft-lbs	40...47 [Nm]

6 Installation information

Seal kit NBR Nr. SKN-1028 ²⁾

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



IMPORTANT!

²⁾ 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 ³⁾

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



IMPORTANT!

³⁾ 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. 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 Ordering code

Ex. CBPP - [] - N - S - 0 - 3.0 - 50 - A

CBPP = counterbalance, non-vented, pilot assistend

10 = size 10, cavity C1025

20M = size 10, 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 cappel adjustment Screw

0 = cartridge only

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

2.3 = pilot ratio 2.3:1

3.0 = pilot ratio 3.0:1

4.5 = pilot ratio 4.5:1

10.0 = pilot ratio 10.0:1

15 = pressure range 500 - 1500 psi

30 = pressure range 1000 - 3000 psi

50 = pressure range 1500 - 5000 psi

A = check spring 20 psi (standard)

B = check spring 5 psi

C = check spring 20 psi, restricted

D = check spring 5 psi, restricted

8 Related data sheets

Reference	(Old no.)	Description
520-P-000220	(0-022.0)	Cavity type C1025
T.b.d.		Cavity type T-11A
520-P-000221	(0-022.1)	Line-mounting body, 10 Series – 2.5-way
T.b.d.		Line-mounting body, 20M Series – 2.5-way

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