Vickers®
Counterbalance Valve

CB Series
315 Bar
80-560 L/min

Mainfold Mounting
SAE Flange Mounting
Subplate Mounting

Powering Business Worldwide

Table of Contents

Counterbalance Valve

General Description

General:

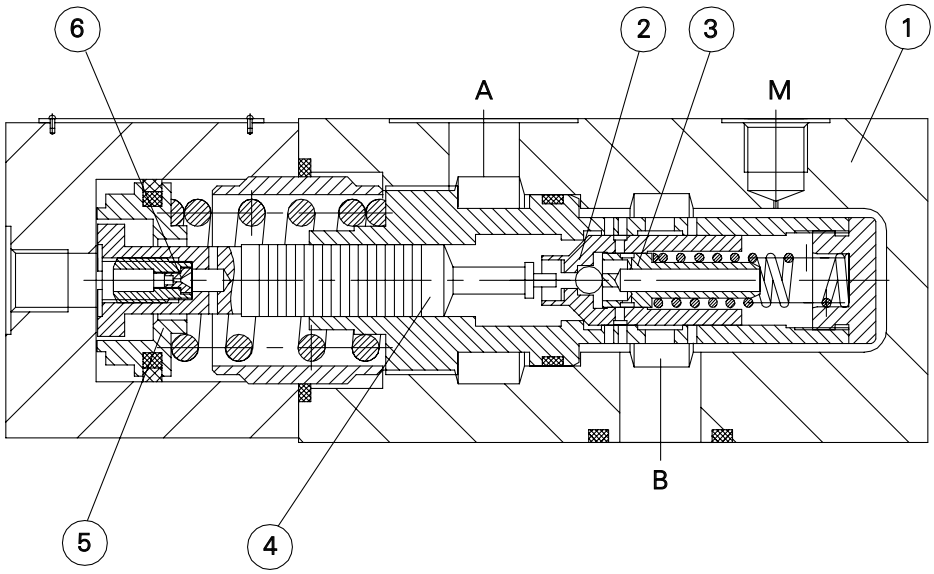
Counterbalance valve are used in hydraulic systems to control the speed of hydraulic motors and cylinders independent of the load (prevents running away). In addition there is a isolater function for pipe burst safety. Counterbalance valve comprises basically of the housing (1), main poppet (2), pilot part (3), pilot spool (4), damping spool (5) and pilot damping (6).

Specs:

Pressure rating 315 bar
Flow up to 560 LPM

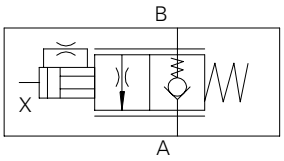
Features:

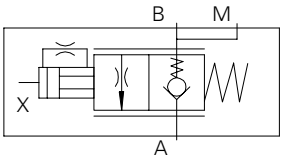
- Pilot operated check valve, leak-free function
- The counterbalance valve controls the returning flow q v2 in relation to the flow being directed into the other side of the actuator q v1. With cylinders the area ratio (q v2=q v1) has to be taken into account
- By-pass valve, free flow in opposite direction
- Optional built-on secondary pressure relief valve (only for flange mounted valve)



Functional Symbols

Without secondary pressure relief valve





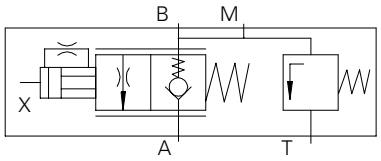
Valve Type:

CB 12 KA 10/B30
CB 16 KA 10/B30
CB 25 KA 10/B40
CB 32 KA 10/B60

Valve Type:

CB 12 GA 10/B30
CB 16 GA 10/B30
CB 25 GA 10/B40
CB 32 GA 10/B60

With secondary pressure relief valve



CB 12 FA 10/B30
CB 16 FA 10/B30
CB 25 FA 10/B40
CB 32 FA 10/B60

Valve Type:

CB 12 F** 10/B30
CB 16 F** 10/B30
CB 25 F** 10/B40
CB 32 F** 10/B60

Model Code

F3 CB 12 G A 10 B00

1 2 3 4 5 6 7

1 Seal Options

F3 – Fluorocarbin seals, for Phosephate Ester (class L-HFD)

Blank – Nitrile, for Mineral oil Anti-wear hydraulic oil (class L-HM) Invert emulsion (class L-HFB)

2 Counterbalance Valve

3 Size

12 - Size 12
16 - Size 16
25 - Size 25
32 - Size 32

4 Mounting Style

F - SAE flange mounting (CD 62)
G - Subplate mounting
K - Cartridge only (for manifold)

5 Secondary Relief Valve

A - No
200 - 200 bar (only on F style)
300 - 300 bar (only on F style)
350 - 350 bar (only on F style)

6 Design Number

7 Orifice

B00 - No orifice
B30 - ϕ 0.3mm orifice (size 12 & 16)
B40 - ϕ 0.4mm orifice (size 25)
B60 - ϕ 0.6mm orifice (size 32)

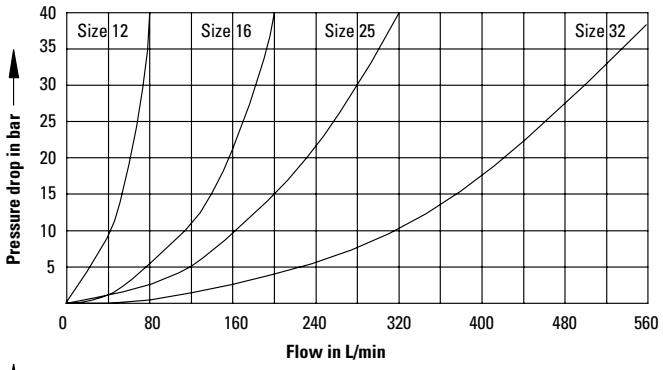
Technical Data

(for applications outside these parameters, please consult us!)

Operating pressure ports A, X	315 bar max.
Operating pressure port B	350 bar max.
Pilot pressure port X	20-35 bar min; 315 bar max.
Cracking pressure A to B	2 bar
Max pressure setting for secondary relief valve	to 350 bar
Flow	80 (size 12), 200 (size 16) L/min.
	320 (size 25), 560 (size 32) L/min.
Area ratio	$\frac{\text{Poppet seat area}}{\text{Pilot spool area}} = \frac{1}{20}$
Fluid temperature range	-20 to +80^0 C
Fluid viscosity range	10-800 mm^2/s
Fluid cleanliness	20/18/15

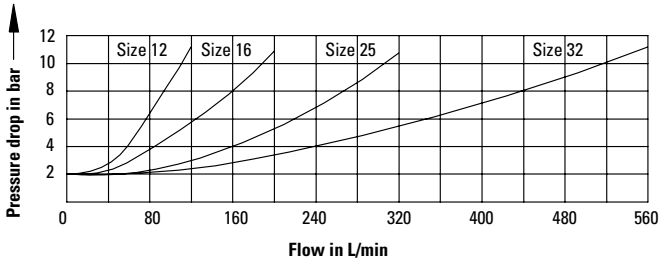
Flow Curves

(measured at v = 41 mm^2/s and t = 50^{O}C)



Pressure differential in relation to flow, measured at throttle position:

Throttle fully open (Px=65 bar) B to A



Flow in L/min.
Pressure differential in relation to flow, measured over the check valve A to B

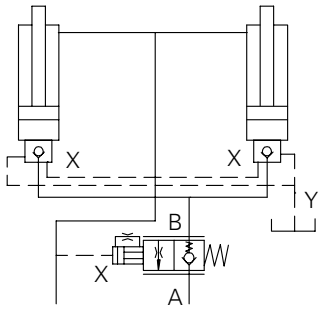
Circuit Examples

Note:

Two counterbalance cannot be used to control two cylinders which are forced mechanically to move together, as synchronization and the same pressure cannot be guaranteed in each cylinder.

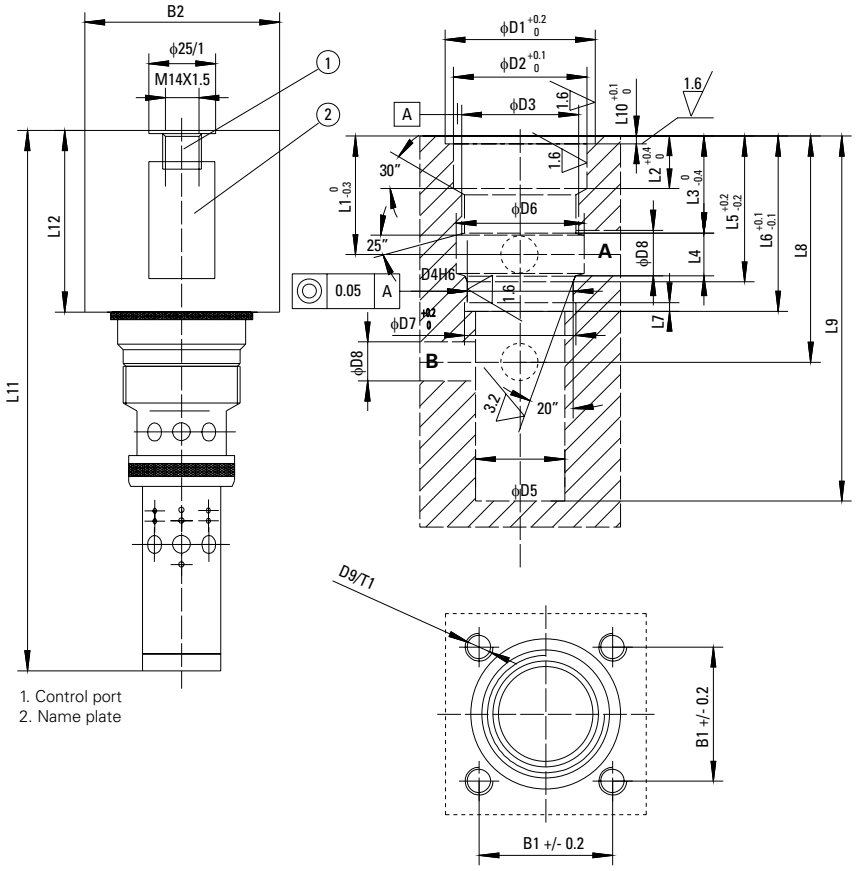
Therefore, the cylinders have to be equipped with two pilot operated check valves. The counterbalance valve is fitted in a common line.

In this case, the load pressure must not exceed 200 bar!



Manifold Mounting

(Dimensions in mm)



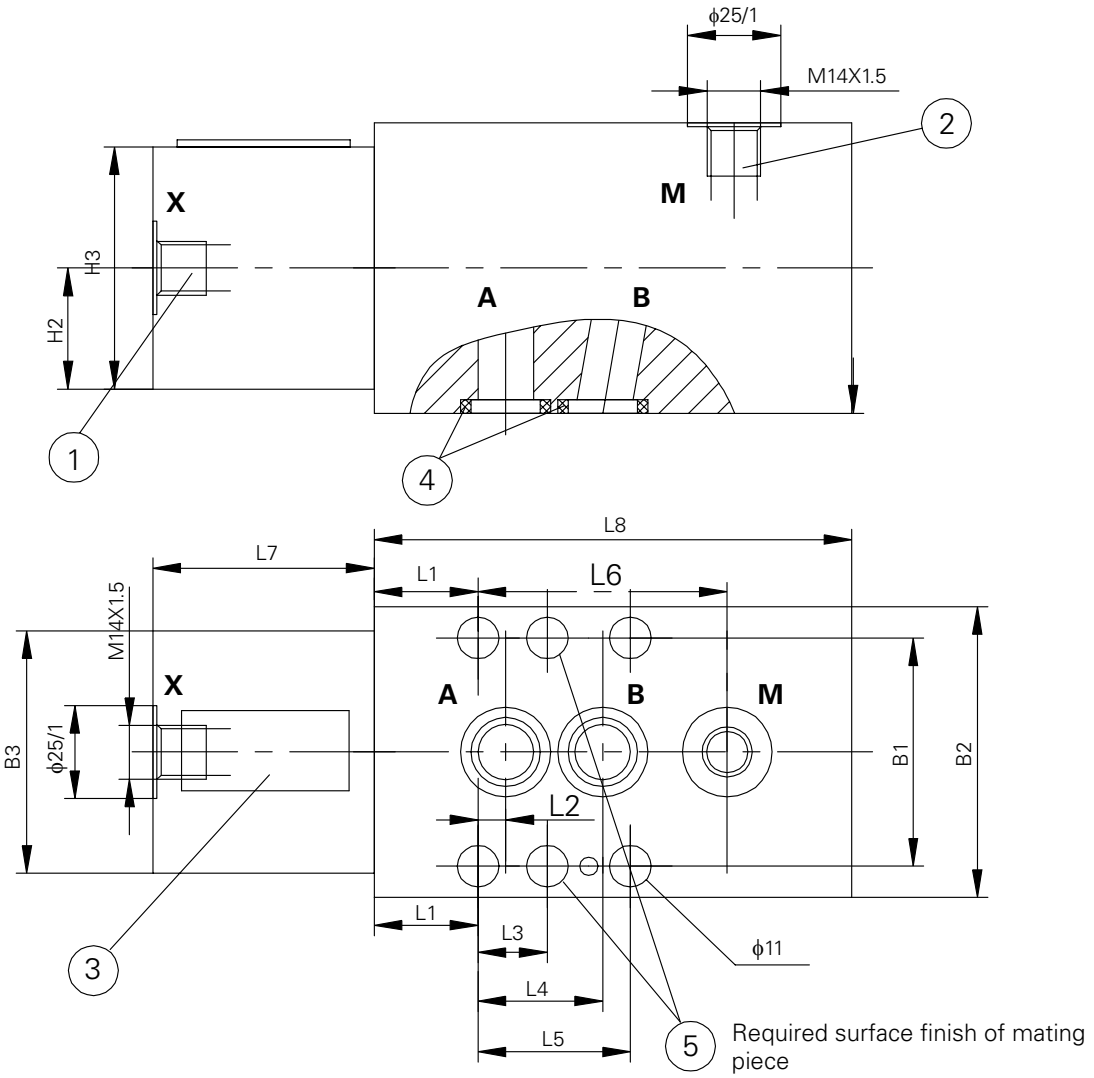
1. Control port
2. Name plate

Type	B1	B2	D1	D2	D3	D4	D5	D6	D7	D8	D9	T1	L1	L2	L3	L4	L5	L6
CB12KA10	48	70	54	46	M42×2	38	34	46	38.6	16	M10	16	39	16	32	15.5	50.6	60
CB16KA10	48	70	54	46	M42×2	38	34	46	38.6	16	M10	16	39	16	32	15.5	50.6	60
CB25KA10	56	80	60	54	M52×2	48	40	60	48.6	25	M12	19	50	19	39	22.0	65.0	80
CB32KA10	66	95	72	65	M64×2	58	52	74	58.6	30	M16	23	52	19	40	25.0	71.0	85

Type	L7	L8	L9	L10	L11	L12	Size	Bolts	Torque(Nm)	Weight
CB12KA10	3	78	128	2.3	191	65	12	4-M10×70-10.9	69	2.8 kg
CB16KA10	3	78	128	2.3	191	65	16	4-M10×70-10.9	69	2.8 kg
CB25KA10	4	105	182	2.3	253	75	25	4-M12×80-10.9	120	2.8 kg
CB32KA10	4	115	198	2.3	289	94	32	4-M16×100-10.9	295	7.5 kg

Sub-plate Mounting

(Dimensions in mm)



1. Control Port

2. Pressure Gauge Port

3. Name Plate

4. O-ring

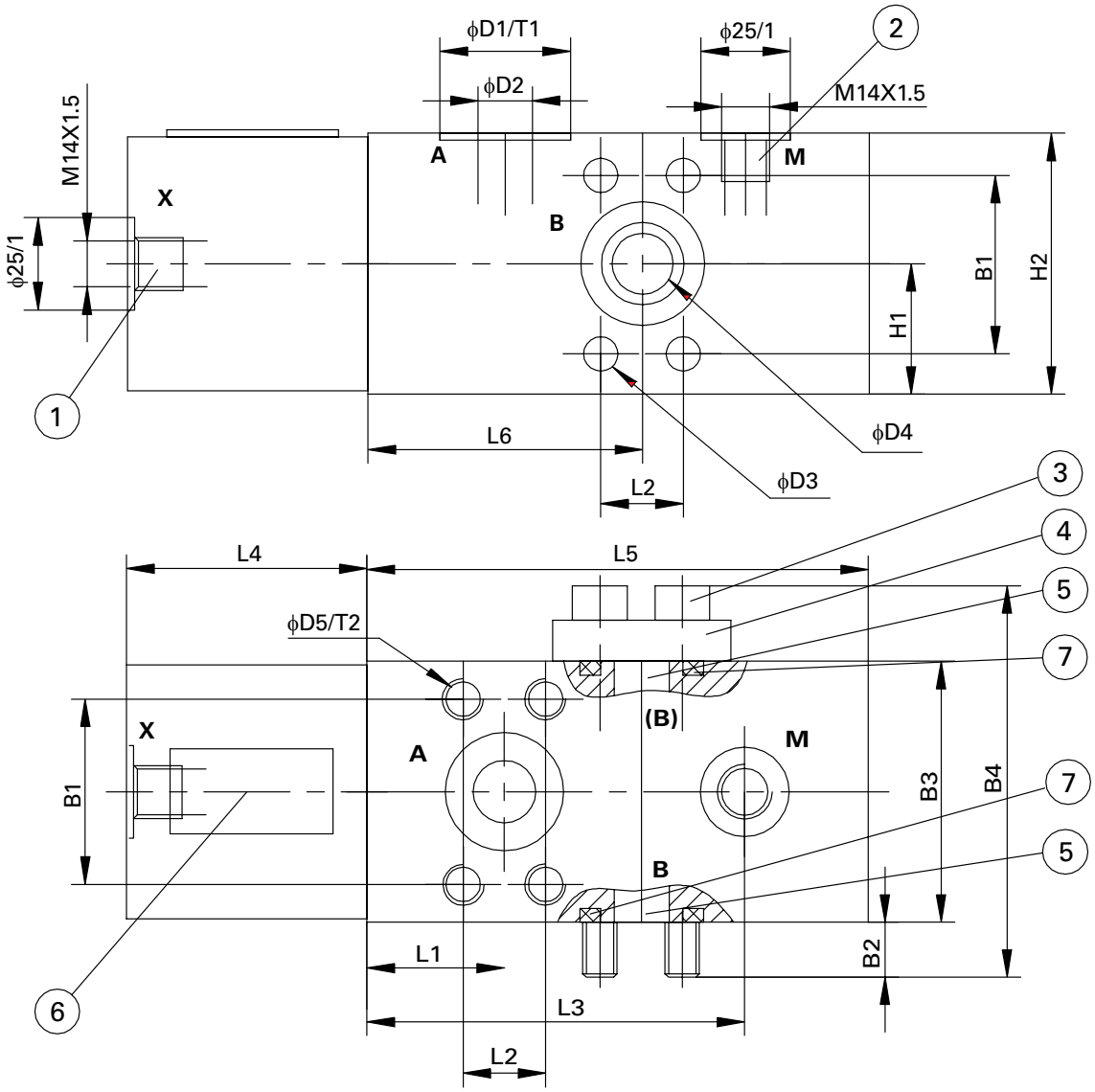
5. 6 Valve fixing holes for size 32

Type	B1	B2	B3	H1	H2	H3	L1	L2
CB 12 GA 10	66.5	85	70	85	42.5	70	32.0	7.0
CB 16 GA 10	66.5	85	70	85	42.5	70	32.0	7.0
CB 25 GA 10	79.5	100	80	100	50.0	80	39.0	11.0
CB 32 GA 10	97.0	120	95	120	60.0	95	35.5	16.5

Type	L3	L4	L5	L6	L7	L8	Weight	O-Ring
CB 12 GA 10	-	35.5	43.0	73.0	65	140	65 kg	21.3x2.4
CB 16 GA 10	-	35.5	43.0	73.0	65	140	65 kg	21.3x2.4
CB 25 GA 10	-	49.0	60.5	109.0	75	200	18 kg	29.82x2.62
CB 32 GA 10	42	67.5	84.0	119.5	94	215	24 kg	38x3

SAE Flange Mounting, Without Secondary Pressure Relief Valve

(Dimensions in mm)



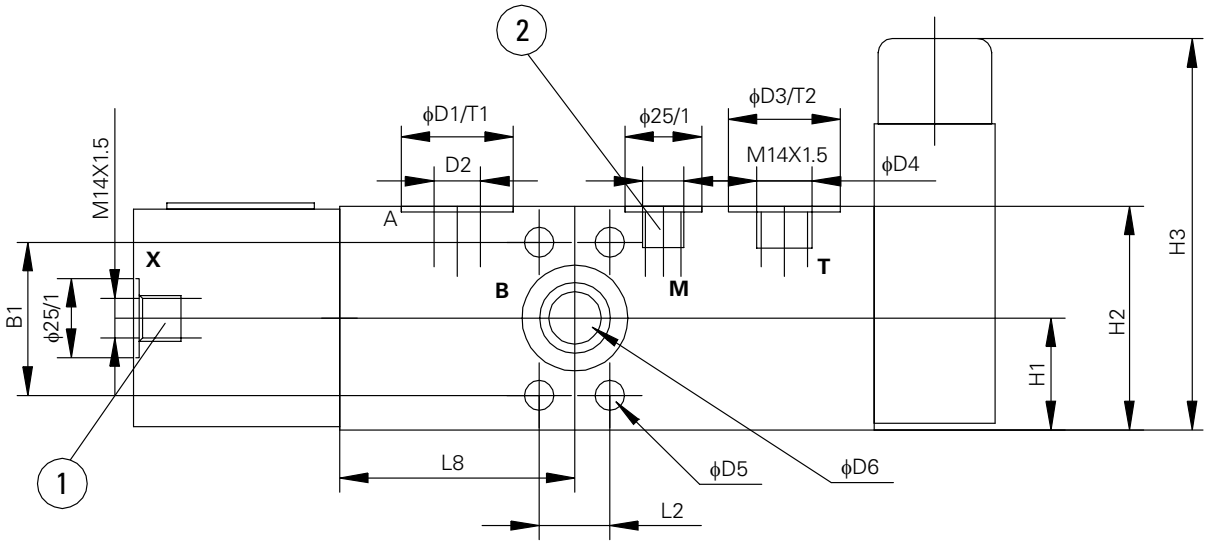
1. Control Port
2. Measuring Port
3. Flange fixing screws
4. Blanking flange
5. Optional port B
6. Name plate
7. O-ring

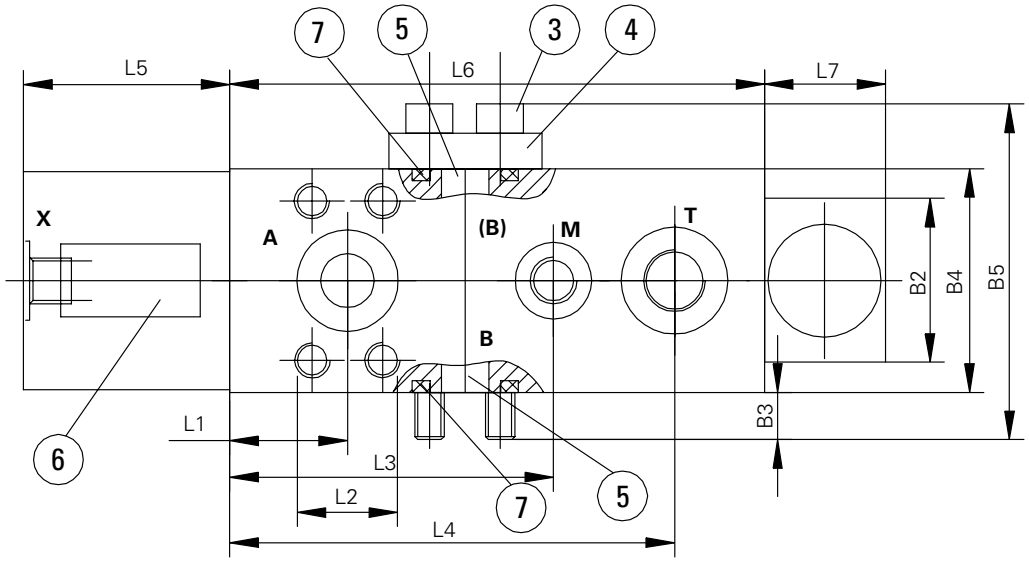
Type	B1	B2	B3	B4	D1	D2	D3	D4	D5	H1	H2
CB 12 FA 10	50.8	16.5	72	110	42	18	10.5	18	M10	36	72
CB 16 FA 10	50.8	16.5	72	110	42	18	10.5	18	M10	36	72
CB 25 FA 10	57.2	14.5	90	132	50	25	13.5	25	M12	45	90
CB 32 FA 10	66.7	20.0	105	154	56	30	15.0	30	M14	50	105

Type	L1	L2	L3	L4	L5	L6	T1	T2	Weight	O-Ring
CB 12 FA 10	39	23.8	105	65	140	78	0.2	15	7 kg	25x3.5
CB 16 FA 10	39	23.8	105	65	140	78	0.2	15	7 kg	25x3.5
CB 25 FA 10	50	27.8	148	75	200	105	0.2	18	16 kg	32.92x3.53
CB 32 FA 10	52	31.6	155	94	215	115	0.2	21	21 kg	37.7x3.53

For SAE Flange Mounting, With Secondary Pressure Relief Valve

(Dimensions in mm)





1. Control Port
2. Measuring Port
3. Flange fixing screws
4. Blanking flange
5. Optional port B
6. Name plate
7. O-ring

Type	B1	B2	B3	B4	B5	D1	D2	D3	D4	D5	D6	D7	H1	H2
CB 12 F** 10	50.8	49	16.5	72	110	42	18	34	M22x1.5	10.5	18	M10	36	72
CB 16 F** 10	50.8	49	16.5	72	110	42	18	34	M22x1.5	10.5	18	M10	36	72
CB 25 F** 10	57.2	78	14.5	90	132	50	25	42	M27x2	13.5	25	M12	45	90
CB 32 F** 10	66.7	78	20	105	154	56	30	42	M27x2	15.0	30	M14	50	105

Type	H3	L1	L2	L3	L4	L5	L6	L7	L8	T1	T2	T3	Weight	O-Ring
CB 12 F** 10	118	39	23.8	105	141.5	65	162	38	78	0.2	1	15	9 kg	25x3.5
CB 16 F** 10	118	39	23.8	105	141.5	65	162	38	78	0.2	1	15	9 kg	25x3.5
CB 25 F** 10	145	50	27.8	148	198.0	75	225	50	105	0.2	1	18	18 kg	32.92x3.53
CB 32 F** 10	145	52	31.6	155	215.0	94	240	50	115	0.2	1	21	24 kg	37.7x3.53

Released Part Numbers

Part Number	Model Code
02-413594	CB-12-F-A-10-B30
02-413595	CB-16-F-A-10-B30
02-413596	CB-25-F-A-10-B40
02-413597	CB-32-F-A-10-B60
02-413598	**F3-CB-12-F-A-10-B30**
02-413599	F3-CB-12-F-200-10-B30
02-413600	F3-CB-12-K-A-10-B30
02-413601	F3-CB-12-G-A-10-B30
02-413602	**F3-CB-16-F-A-10-B30**
02-413603	F3-CB-16-F-200-10-B30
02-413604	F3-CB-16-K-A-10-B30
02-413605	F3-CB-16-G-A-10-B30
02-413606	**F3-CB-25-F-A-10-B40**
02-413607	F3-CB-25-F-200-10-B40
02-413608	F3-CB-25-F-300-10-B40
02-413609	F3-CB-25-K-A-10-B40
02-413610	F3-CB-25-G-A-10-B40
02-413611	**F3-CB-32-F-A-10-B60**
02-413612	F3-CB-32-F-200-10-B60
02-413613	F3-CB-32-F-300-10-B60
02-413614	F3-CB-32-K-A-10-B60
02-413615	F3-CB-32-G-A-10-B60

Items in bold are preferred product

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