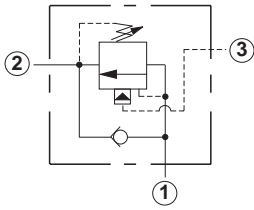


Counterbalance Valves

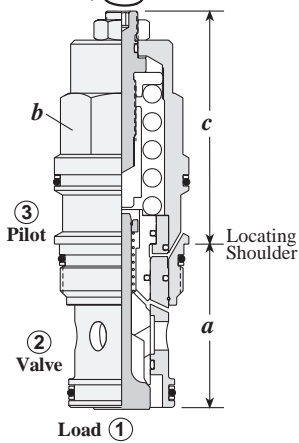
STANDARD, 280 BAR MAXIMUM SETTING



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	L	C	
60 L/min.	CBCA – LHN	T - 11A	34,9	22,2	50	56	40/50
120 L/min.	CBEA – LHN	T - 2A	34,9	28,6	61	64	60/70
240 L/min.	CBGA – LHN	T - 17A	46	31,8	70	84	200/215
480 L/min.	CBIA – LHN	T - 19A	63,5	41,3	90	104	465/500

OPTION ORDERING INFORMATION

Turn screw clockwise to reduce setting and release load. Complete Adjustment 3 Turns

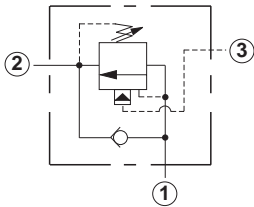


Nominal Capacity	Control**		Cracking Pressure		Seal
	Control**	Version	Cracking Pressure	Cracking Pressure	
C 60 L/min.	L Standard Screw		2 Bar Check Spring	N Buna-N	
E 120 L/min.	C Tamper Resistant		H 70 - 280 bar	V Viton	
G 240 L/min.			I 25 - 105 bar		
I 480 L/min.			0,3 Bar Check Spring		
	A 3:1 Pilot Ratio		A 70 - 280 bar		
	B 1.5:1 Pilot Ratio (with sealed pilot)		B 25 - 105 bar		
	Y 2:1 Pilot Ratio (with bleed through pilot)				

Adjustment Range Options:
A and H are standard set at 210 bar.
I and B are standard set at 70 bar.
Customer may specify setting.

** See page 244 for information on Control Options

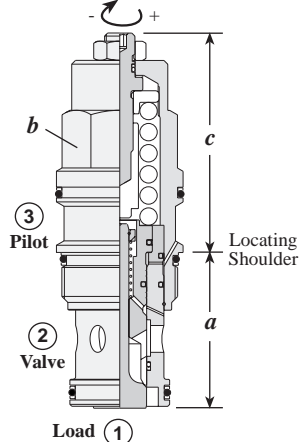
STANDARD, 350 BAR MAXIMUM SETTING



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions				Installation Torque (Nm)
			a	b	L	C	
60 L/min.	CBCG – LJN	T - 11A	34,9	22,2	50	56	40/50
120 L/min.	CBEG – LJN	T - 2A	34,9	28,6	61	64	60/70
240 L/min.	CBGG – LJN	T - 17A	46	31,8	70	84	200/215
480 L/min.	CBIG – LJN	T - 19A	63,5	41,3	90	104	465/500

OPTION ORDERING INFORMATION

Turn screw clockwise to reduce setting and release load. Complete Adjustment 3 Turns



Nominal Capacity	Control**		Cracking Pressure		Seal
	Control**	Version	Cracking Pressure	Cracking Pressure	
C 60 L/min.	L Standard Screw		2 Bar Check Spring	N Buna-N	
E 120 L/min.	C Tamper Resistant		J 140 - 350 bar	V Viton	
G 240 L/min.			K 70 - 175 bar		
I 480 L/min.			0,3 Bar Check Spring		
	G 4.5:1 Pilot Ratio		C 140 - 350 bar		
	H 10:1 Pilot Ratio		D 70 - 175 bar		
	L 2.3:1 Pilot Ratio (with sealed pilot)				

Adjustment Range Options:
J and C are standard set at 210 bar.
K and D are standard set at 140 bar.
Customer may specify setting.

** See page 244 for information on Control Options

TECHNICAL TIPS / PERFORMANCE CURVES

Counterbalance Valves, 3:1, 1.5:1 and 2:1 Pilot Ratio, External Pilot, Non-vented

Applications

The Sun three port counterbalance cartridges (with pilot to open assist) are modulating devices that allow free flow from port 2 (inlet) to port 1 (load) and then block reverse flow until a pilot pressure inversely proportional to the load pressure is sensed at port 3 (pilot) or load pressure exceeds relief setting. These valves improve the motion control of most control valve systems by ensuring that the actuator always sees a positive load pressure, even under overrunning load situations.

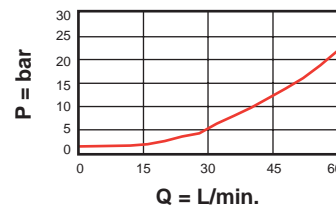
Design Concepts and Features

- Recommended minimum setting should be 1.3 times maximum load induced pressure.
- 3:1, 1.5:1, 2:1 pilot ratio, load holding to 210 bar (with 280 bar setting).
- Load reactive pilot assist for overcentre load control applications.
- 5 drops/min. maximum leakage at reseal.
- Reseat exceeds 85% of set pressure at standard setting.
- Back pressure at Port 2 may adversely affect operation of valve. For circuits with back pressure Sun recommends vented counterbalance valves CW** (vented valves).

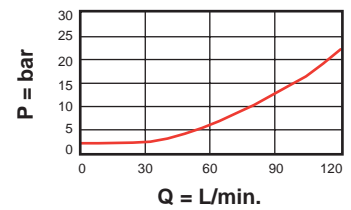
Performance Curves

Free Flow and Pilot Open Pressure Drop

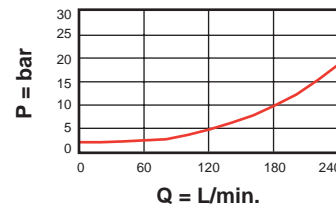
CBC*-L*N



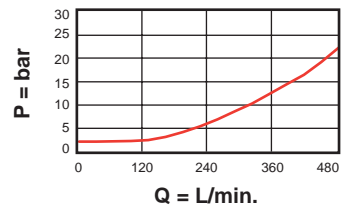
CBE*-L*N



CBG*-L*N



CBI*-L*N



Counterbalance Valves, 4.5:1, 10:1 and 2.3:1 Pilot Ratio, External Pilot, Non-vented

Applications

The Sun three port counterbalance cartridges (with pilot to open assist) are modulating devices that allow free flow from port 2 (inlet) to port 1 (load) and then block reverse flow until a pilot pressure inversely proportional to the load pressure is sensed at port 3 (pilot) or load pressure exceeds relief setting. These valves improve the motion control of most control valve systems by ensuring that the actuator always sees a positive load pressure, even under overrunning load situations.

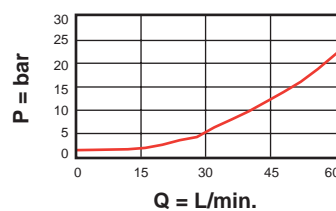
Design Concepts and Features

- Recommended minimum setting should be 1.3 times maximum load induced pressure.
- 4.5:1 10:1, 2.3:1 pilot ratio, load holding to 280 bar (with 350 bar setting).
- Load reactive pilot assist for overcentre load control applications.
- 5 drops/min. maximum leakage at reseal.
- Reseat exceeds 85% of set pressure at standard setting.
- Back pressure at Port 2 may adversely affect operation of valve. For circuits with back pressure Sun recommends vented counterbalance valves CW** (vented valves).

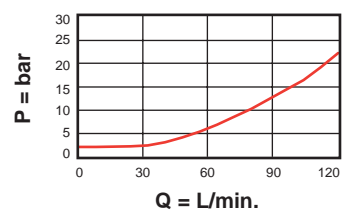
Performance Curves

Free Flow and Pilot Open Pressure Drop

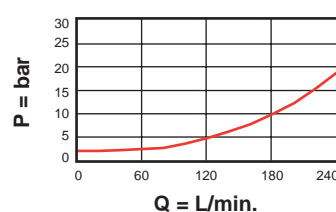
CBC*-L*N



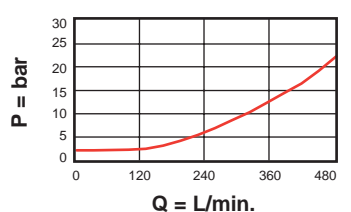
CBE*-L*N



CBG*-L*N



CBI*-L*N



General Application Requirements

- Operating Temperature Range: Buna-N seals -45° C to 90° C, Viton seals -15° C to 120° C.
- Viscosity Range: 10-600 centistokes.
- Fluid Contamination Level: ISO 4406 18/15 or better; Recommend $\beta_{10} \geq 75$ to achieve ISO 18/15 or better in most systems.
- Factory Pressure Setting for cartridge is established at cracking flow 35 cc/min.