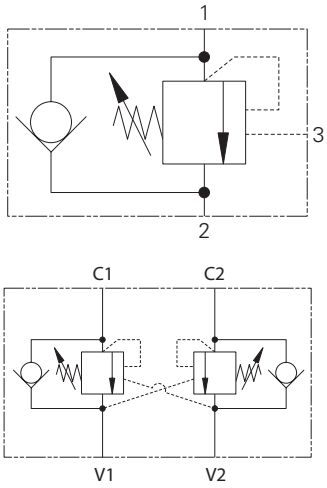
Motion control valves

Motion control functions for applications up to 350 bar (5000 psi) and 550 L/min (143 USgpm)

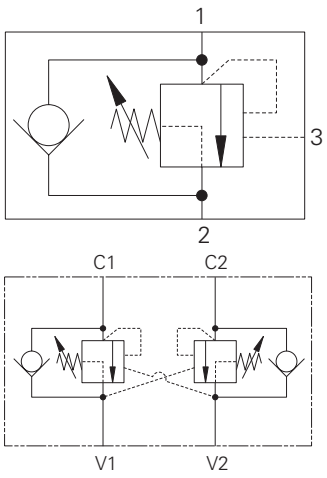
Powering Business Worldwide

Motion control valves

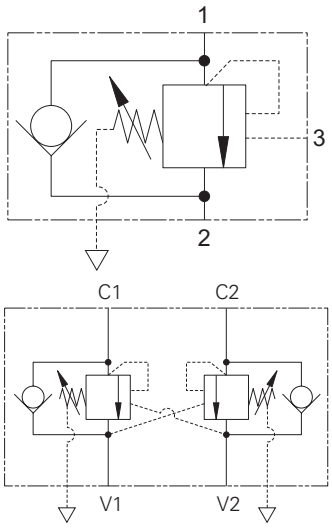
Functional symbol



Model	Cavity	Flow rating	Typical pressure	Page
OCV standard		L/min (USgpm)	bar (psi)	
1CE20	A22903	20 (5)	270 (4000)	F-10
1CE30	A6610	30 (8)	270 (4000)	F-12
1CEH30	A6610	30 (8)	350 (5000)	F-14
1CE90	A12336	90 (23)	270 (4000)	F-30
1CEH90	A12336	90 (23)	350 (5000)	F-32
1CE120	A877	120 (32)	270 (4000)	F-48
1CE140	A20081	140 (37)	340 (4390)	F-58
1CE300	A6935	300 (80)	270 (4000)	F-64
1SE30	A20090-T11A	30 (8)	270 (4000)	F-76
1SE90	A20092-T2A	90 (23)	270 (4000)	F-84
1SE140	A20094-T17A	140 (37)	340 (4390)	F-92



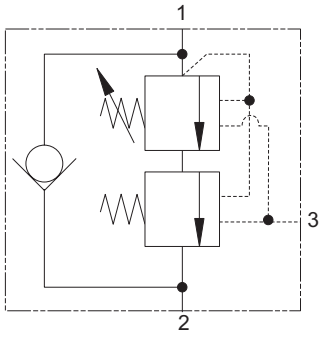
Model	Cavity	Flow rating	Typical pressure	Page
OCV part balanced		L/min (USgpm)	bar (psi)	
1CER30	A6610	30 (8)	270 (4000)	F-16
1CERH30	A6610	30 (8)	350 (5000)	F-18
1CER90	A12336	90 (23)	270 (4000)	F-34
1CERH90	A12336	90 (23)	350 (5000)	F-36
1CER140	A20081	140 (37)	340 (4390)	F-60
1SER30	A20090-T11A	30 (8)	270 (4000)	F-78
1SER90	A20092-T2A	90 (23)	270 (4000)	F-86
1SER140	A20094-T17A	140 (37)	340 (4390)	F-96



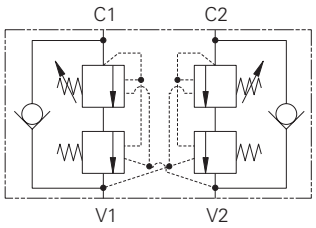
Model	Cavity	Flow rating	Typical pressure	Page
OCV fully balanced		L/min (USgpm)	bar (psi)	
1CEB30	A6610	30 (8)	270 (4000)	F-20
1CEB90	A12336	90 (23)	270 (4000)	F-38
1CEB120	A877	120 (32)	270 (4000)	F-50
1CEB300	A6935	300 (80)	270 (4000)	F-66
1SEB30	A20090-T11A	30 (8)	270 (4000)	F-80
1SEB90	A20092-T2A	90 (23)	270 (4000)	F-88

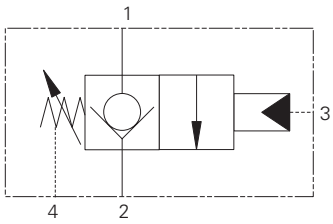
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Functional symbol

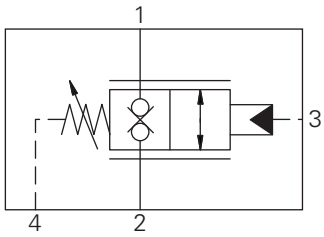


Model	Cavity	Flow rating	Typical pressure	Page
OCV counterbalanced		L/min (USgpm)	bar (psi)	
1CEL30	A6610	30 (8)	380 (5510)	F-24
1CEL90	A12336	90 (23)	380 (5510)	F-42
1CEL140	A20081	140 (37)	380 (5510)	F-62
1SEL30	A20090-T11A	30 (8)	380 (5510)	F-82
1SEL90	A20092-T2A	90 (23)	380 (5510)	F-90
1SEL140	A20094-T17A	140 (37)	380 (5310)	F-96

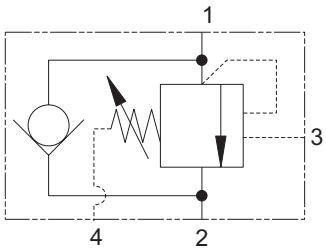




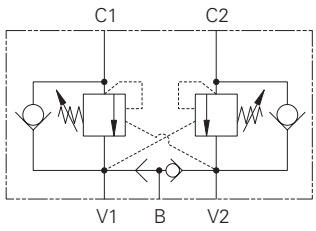
Model	Cavity	Flow rating	Typical pressure	Page
OCV zero differential		L/min (USgpm)	bar (psi)	
1CPBD30	AXP 20530	30 (8)	350 (5000)	F-26
1CPBD90	A12196	90 (23)	350 (5000)	F-44
1CPBD120	A6726	180 (47)	400 (5800)	F-54
1CPBD300	A13098	300 (80)	400 (5800)	F-70



Model	Cavity	Flow rating	Typical pressure	Page
OCV normally closed zero differential		L/min (USgpm)	bar (psi)	
1CPPD90	A12196	90 (23)	350 (5000)	F-46
1CPPD300	A13098	300 (80)	350 (5000)	F-72



Model	Cavity	Flow rating	Typical pressure	Page
OCV fully balanced		L/min (USgpm)	bar (psi)	
1CEBD30	A20530	30 (8)	350 (5000)	F-22
1CEBD90	A12196	90 (23)	270 (4000)	F-40
1CEBD120	A6726	180 (47)	270 (4000)	F-52
1CEBD300	A13098	300 (80)	270 (4000)	F-68



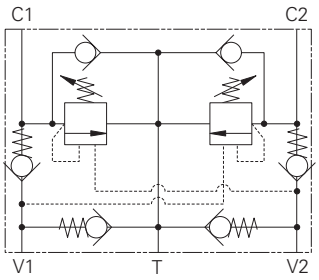
Model	Cavity			
Motion control valve, with brake shuttle		L/min (USgpm)	bar (psi)	Page
1CEESH35		30 (8)	270 (4000)	F-98
1CEESH95		90 (23)	270 (4000)	F-100
1CEESH150		150 (40)	270 (4000)	F-102
1CEESH350		300 (80)	270 (4000)	F-104

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

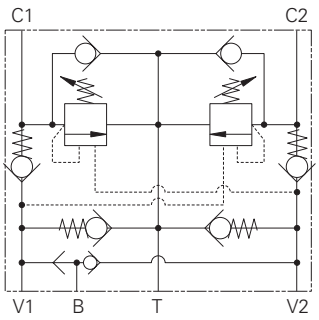
Motion controls

Valve locator

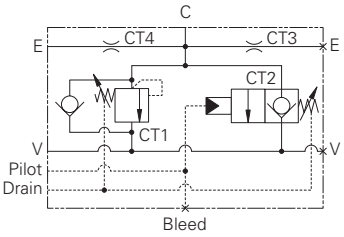
Functional symbol



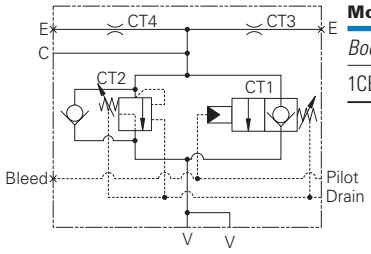
Model	Cavity	Flow rating	Typical pressure	Page
Motion control valve & lock		**L/min (USgpm)**	**bar (psi)**	
1CEEC35		30 (8)	270 (4000)	F-106
1CEEC95		95 (25)	270 (4000)	F-108
1CEEC150		150 (40)	270 (4000)	F-110
1CEEC350		300 (80)	270 (4000)	F-112



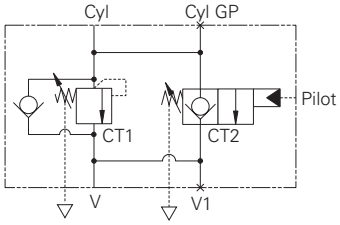
Model	Cavity	Flow rating	Typical pressure	Page
Motion control valve & lock with brake shuttle		**L/min (USgpm)**	**bar (psi)**	
1CEECSH35		30 (8)	270 (4000)	F-114
1CEECSH95		95 (25)	270 (4000)	F-116
1CEECSH150		150 (40)	270 (4000)	F-118
1CEECSH350		350 (80)	270 (4000)	F-120



Model	Cavity	Flow rating	Typical pressure	Page
BoomLoc		**L/min (USgpm)**	**bar (psi)**	
1CEBL256		250 (66)	350 (5000)	F-124
1CEBL356		350 (92)	350 (5000)	F-126



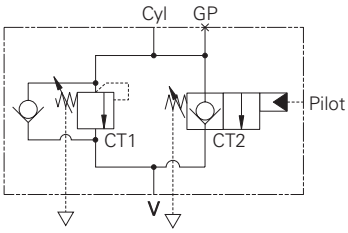
Model	Cavity	Flow rating	Typical pressure	Page
BoomLoc		**L/min (USgpm)**	**bar (psi)**	
1CEBL556		550 (145)	400 (5800)	F-128



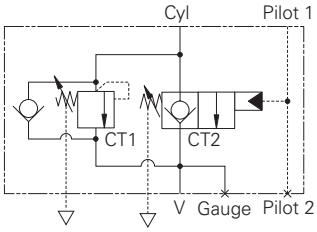
Model	Cavity	Flow rating	Typical pressure	Page
BoomLoc		**L/min (USgpm)**	**bar (psi)**	
1CEBL31F3W35P		30 (8)	350 (5000)	F-130

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

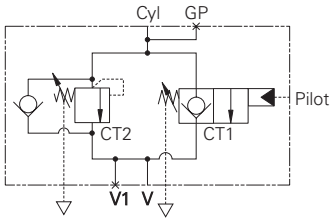
Functional symbol



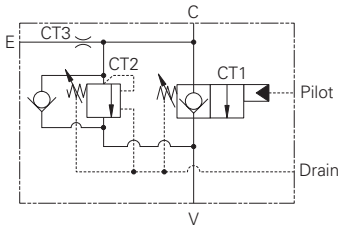
Model	Cavity	Flow rating	Typical pressure	Page
BoomLoc		L/min (USgpm)	bar (psi)	
1CEBL31F1/2635P		30 (8)	350 (5000)	F-133



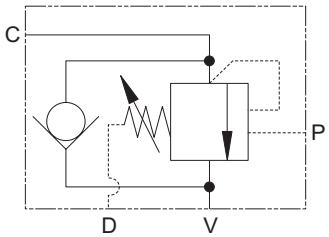
Model	Cavity	Flow rating	Typical pressure	Page
BoomLoc		L/min (USgpm)	bar (psi)	
1CEBL31F4W35P		30 (8)	350 (5000)	F-135



Model	Cavity	Flow rating	Typical pressure	Page
BoomLoc		L/min (USgpm)	bar (psi)	
1CEBL91F4W35P		90 (24)	350 (5000)	F-136



Model	Cavity	Flow rating	Typical pressure	Page
BoomLoc		L/min (USgpm)	bar (psi)	
1CEBL151F4W35P		150 (40)	350 (5000)	F-138



Model	Cavity	Flow rating	Typical pressure	Page
BoomLoc		L/min (USgpm)	bar (psi)	
1CEBL153F4W35P		150 (40)	350 (5000)	F-140

F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Motion control valves

Section contents

This section contains a most extensive range of overcenter and motion control cartridges, including normal, part vented and fully vented versions. Suitable for load holding, load safety and to prevent load runaway, giving low pressure drops, various pilot ratios and excellent stability to all types of moving loads.

Adjustments

The adjustment range and Max setting figures shown throughout this catalogue give the design range for each valve, higher or lower values may be attainable but should not be used without first contacting our Engineering department. Setting must ALWAYS be carried out using an appropriate gauge and it must NOT be assumed that screwing an adjuster to its maximum or minimum position will yield the maximum or minimum stated design setting for that valve.

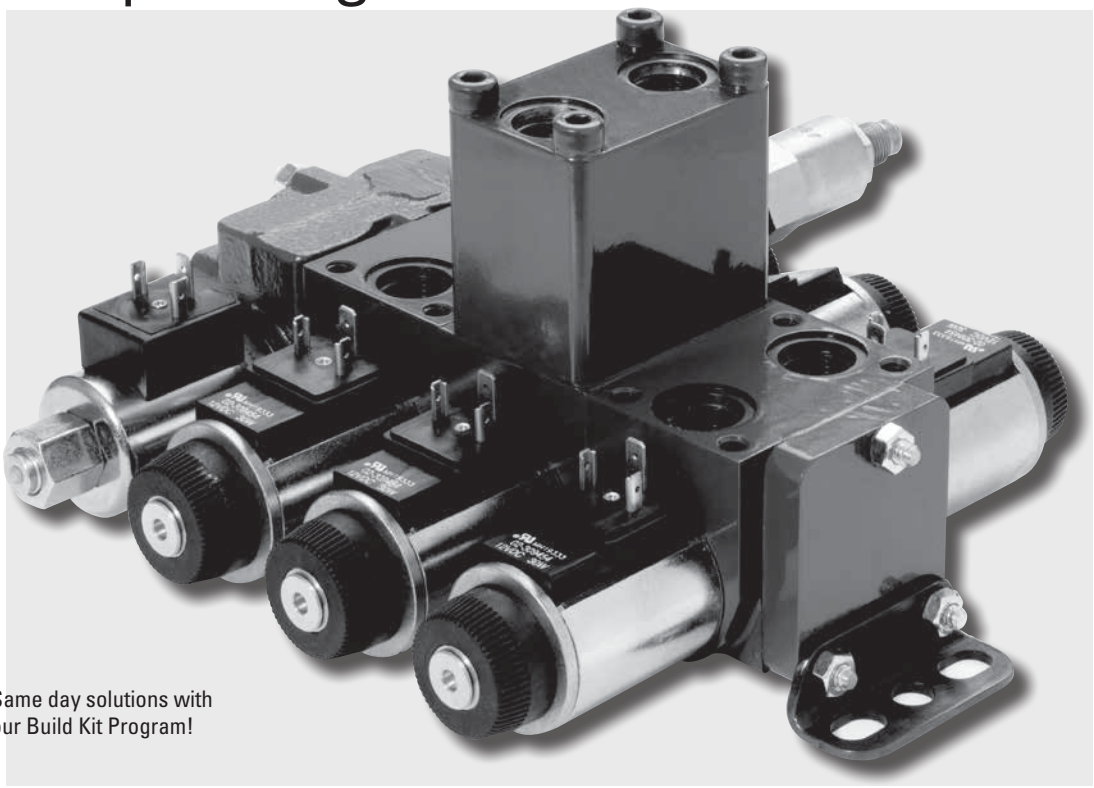
1CE/1CEE Overcenter cartridge pilot assisted relief with check	To control moving loads and prevent load runaway, giving load holding and hose failure safety
1CER Overcenter cartridge as 1CE series with relief balanced	As 1CE series but with relief balanced against back pressure allowing the valve to be used with closed center DCV with service line reliefs
1CEB/1CEBD Overcenter cartridge as 1CE series with relief and pilot balanced	As 1CE series but balanced on relief and pilot areas. For use on proportional systems or applications with widely varying back pressures
1CEL Overcenter cartridge with constant counterbalance pressure	This valve is used in systems where the machine framework introduces instability, such as telescopic handlers, cranes and concrete pumps
1CPB/1CPBD Pilot controlled cartridges without relief function, unaffected by back pressure	For use on boom lock applications giving load-holding and hose failure safety. With or without internal relief
1CEEC Line mounted overcenter with make up checks. Piece parts in body style	Motion control valves with make up checks and cross line relief function for use on transmission systems or single rod cylinders when dual relief is required
1CEESH/1CEECSH As ICEEC series with brake shuttle. Piece parts in body style	As ICEEC series but with added brake shuttle for removal of spring applied park brakes
1CEBL In-line or cylinder mounted BoomLoc valves incorporating 1CPB(D) cartridge and additional relief cartridge element	These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Versatile, Proven, Best Value

Sectional Design for Multiple Configurations



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EATON
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MDG Mobile Valve

Eaton's MDG mobile directional control valve uses a modular, versatile design based on our proven Vickers® DG4V3 design.

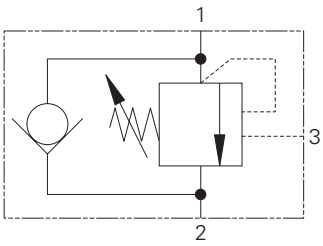
Eaton® MDG valves, truly designed for mobile applications, offer the traditional benefits of a stackable mobile valve and provide further value as circuit options for mobile manifold systems. This same versatility and flexibility applies to system applications, making it your best value for customized, multi-functional circuits.

For more information, contact your local Eaton distributor, call us at 800-547-7805 or visit us on the web at: www.eaton.com/hydraulics.

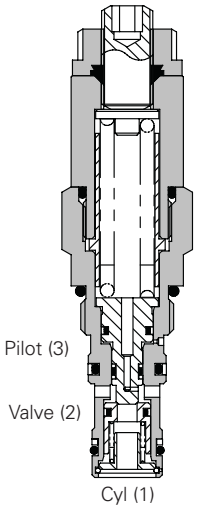
F

1CE20 - Overcenter valve

Pilot assisted relief with check
20 L/min (5 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

3:1 Best suited for extremely unstable applications such as long booms or flexible frameworks.

4.5:1 Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

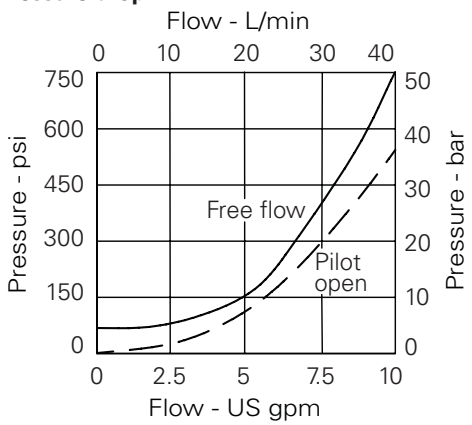
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40° C Viscosity = 32 cSt (150 SUS)	
Rated flow	20 L/min (5 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A22903 (See Section M)
Torque cartridge into cavity	40 Nm (30 lbs ft)
Weight	1CE20 0.16 kg (0.35 lbs) 1CE25 0.37 kg (0.82 lbs) 1CEE24 0.41 kg (0.89 lbs)
Seal kit number	SK1276 (Nitrile) SK1276V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30°C to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE* – F 3W – 35 S 3**
1 2 3 4 5 6

1 Basic code

1CE20 - Cartridge Only
1CE25 - Cartridge and Body
1CEE24 - Cartridges and Dual Body

2 Adjustment means

F - Screw Adjustment
N - Fixed - State pressure setting required.

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port sizes

Code	Port size	Housing number - body only			
		Aluminum single	Steel single	Aluminum dual	Steel dual
3W	3/8" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B24255	B24254	B24261	B24260
6T	3/8" SAE Valve & Cyl Port. 1/4" SAE Pilot Port	B24257	B24256	B24264	B24263

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 100-230 bar. Std setting 140 bar

35 - 200-350 bar. Std setting 210 bar

Std setting made at 4.8 L/min
Other pressure ranges available on request

5 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot ratio

3 - 3:1

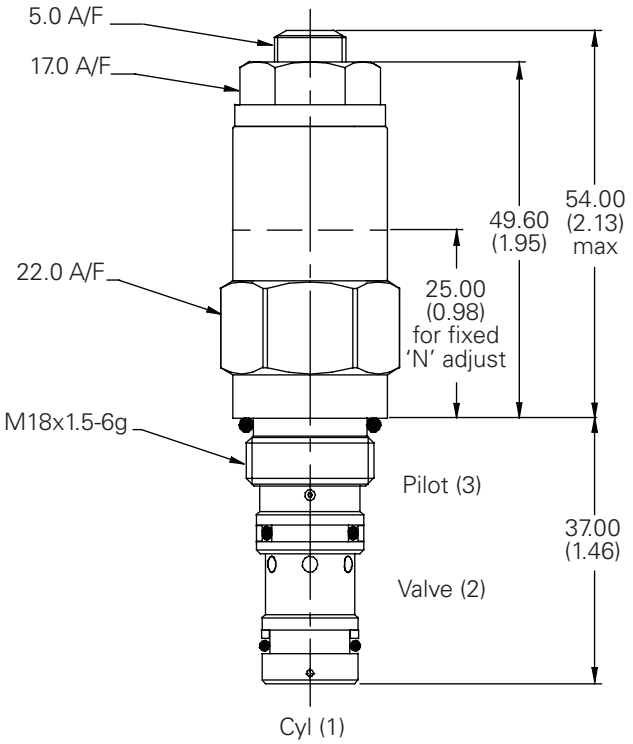
4 - 4.5.1

8 - 8:1

Dimensions

mm (inch)

Cartridge only
Basic Code
1CE20

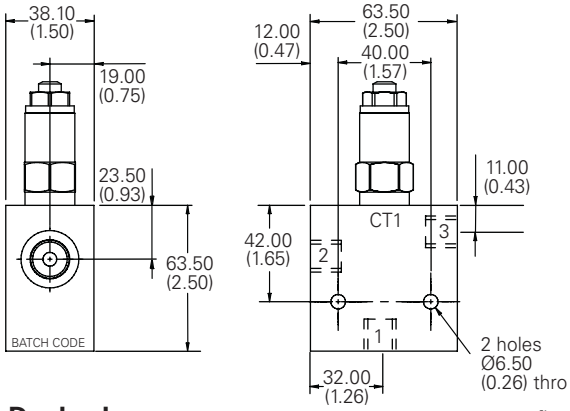


Note: For applications above 210 bar - please consult our technical department or use the steel body option.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

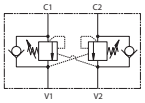
Single valve

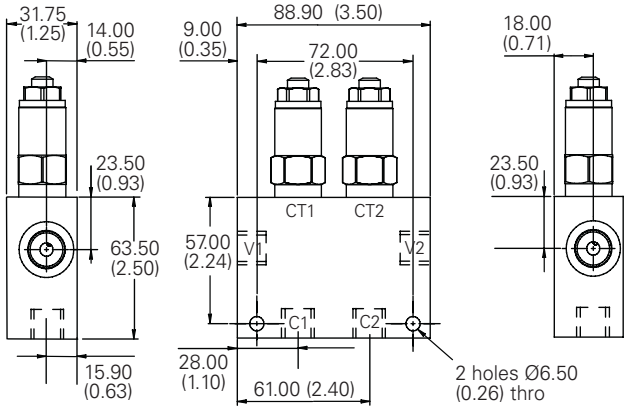
3/8" Ports
Basic Code 1CE25



Dual valve

3/8" Ports
Basic Code 1CEE24 (Internally Cross Piloted)

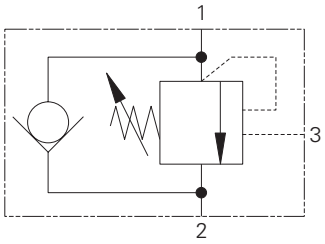




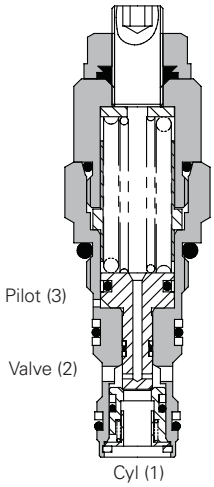
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CE30 - Overcenter valve

Pilot assisted relief with check
30L/min (8 USgpm) • 270 bar (4000 psi)



Sectional View



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

2.5:1 Best suited for extremely unstable applications such as long booms or flexible frameworks.

5:1 (standard) Best suited for applications where load varies and machine structure can induce instability.

10:1 Best suited for applications where the load remains relatively constant.

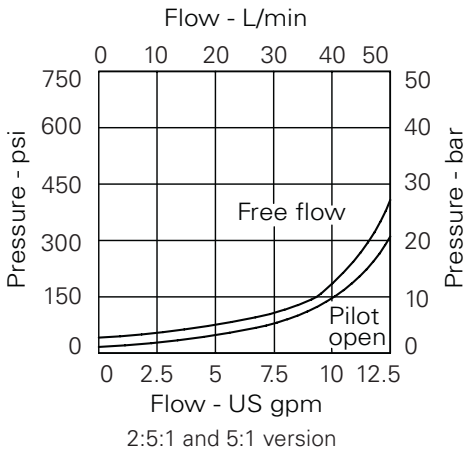
Performance data

Ratings and specifications

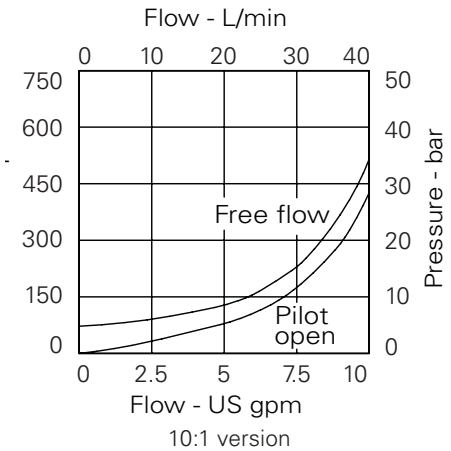
Figures based on: Oil Temp = 40° C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity	A6610 (See Section M)
Torque cartridge into cavity	45 Nm (33 lbs ft)
Weight	1CE30 0.15 kg (0.33 lbs) 1CE35 0.41 kg (0.90 lbs) 1CEE34 0.90 kg (1.98 lbs)
Seal kits	SK395 (Nitrile) SK395V (Viton®)
Filtration	Cleanliness code 18/13 (25 micron nominal)
Temperature range	-30°C to +90°C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



2:5:1 and 5:1 version



10:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE* – F 3W – 35 S 5**

1 2 3 4 5 6

1 Function

1CE30 - Cartridge Only

1CE35 - Cartridge in body

1CEE34 - Cartridges in dual body

2 Adjustment

F - Screw adjustment

N - Fixed

For fixed versions add setting in 10 bar increments to end of part number. Subject to a +/-10% tolerance.

3 Port size

Code	Port size	Housing number - body only			
		Aluminum single	Steel single	Aluminum dual	Steel dual
3W	3/8" BSPP	B6743	B12823	B6836	B13803
6T	3/8" SAE	B10536		B10805	
8T	1/2" SAE	B7884		B30237	

4 Pressure range

Note: Code based on pressure in bar.

20 - (2.5:1 and 5:1): 70-210 bar.
Std setting 100 bar
(10:1): 100-210 bar.
Std setting 100 bar

35 - (2.5:1 and 5:1): 100-350 bar.
Std setting 210 bar
(10:1): 120-350 bar.
Std setting 210 bar

5 Seal material

S - Buna-N

SV - Viton

6 Pilot ratio

2 - 2:1

5 - 5:1

10 - 10:1

F

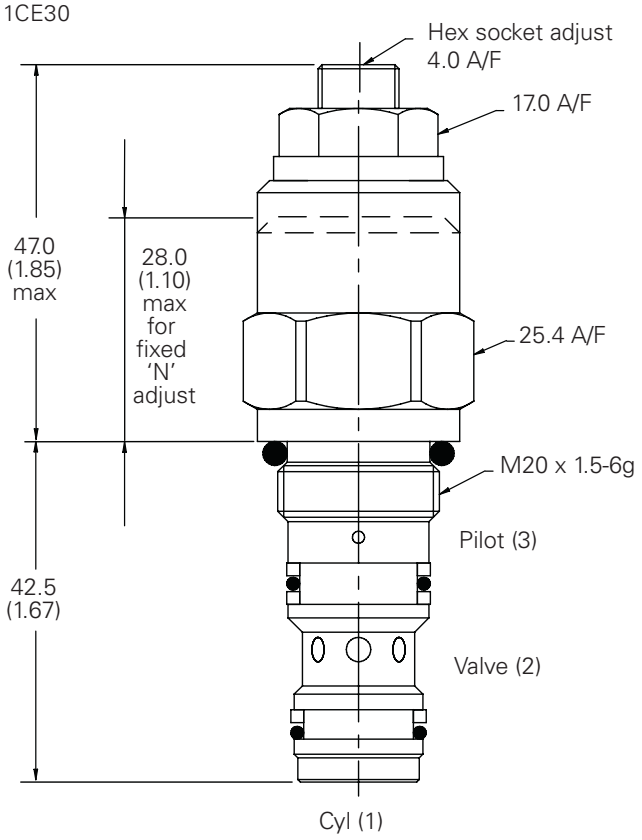
Dimensions

mm (inch)

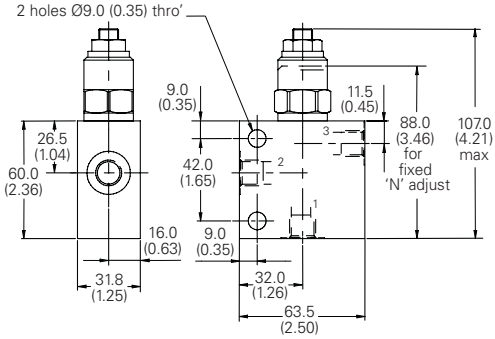
Note: For applications above 210 bar - please consult our technical department or use the steel body option

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

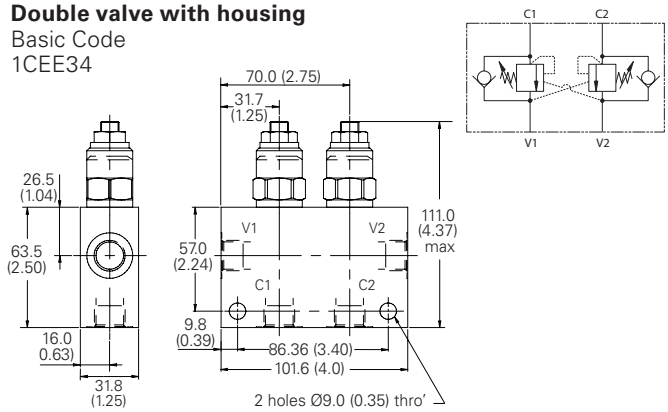
Cartridge only
Basic Code
1CE30



Single valve with housing
Basic Code
1CE35



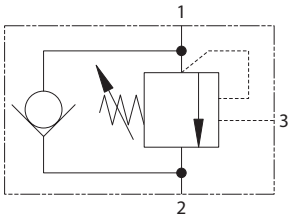
Double valve with housing
Basic Code
1CEE34



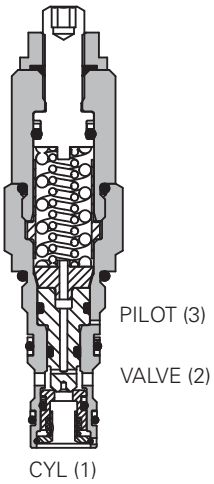
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEH30 - High pressure overcenter valve

Pilot assisted relief with check
30L/min (8 USgpm) • 350 bar (5000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Dynamic seals on the internal moving parts to provide longer fatigue life.

Pilot ratio

3:1 Best suited for extremely unstable applications such as long booms or flexible frameworks.

5:1 (standard) Best suited for applications where load varies and machine structure can induce instability.

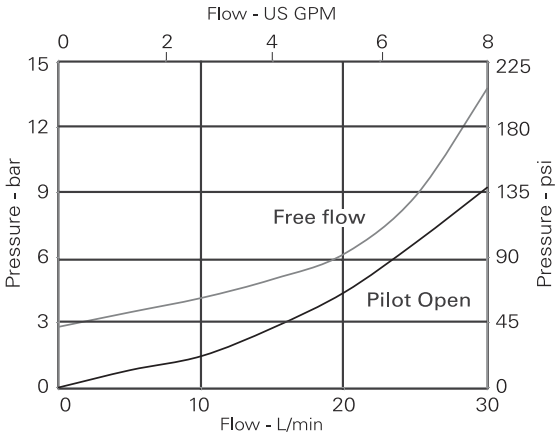
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40° C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief pressure	430 bar (6240 psi)
Max load induced pressure	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Steel. Add suffix "377".
Mounting position	Unrestricted
Cavity	A6610 (See Section M)
Torque cartridge into cavity	68-75 Nm (50-56 lbs ft)
Weight	1CEH30 0.25 kg (0.55 lbs) 1CEH35 0.51 kg (1.12 lbs) 1CEEH34 1 kg (2.2 lbs)
Seal kits	9900925-000 (Nitrile) 9900926-000 (Viton®)
Filtration	Cleanliness code 18/13 (25 micron nominal)
Temperature range	-30°C to +90°C (-22° to +194°F)
Internal leakage	5 dpm - Leakage at 85% of Crack Pressure
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



3:1 and 5:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CEH* – F 3W – 43 S ***

1 2 3 4 5 6

1 Function

1CEH30 - Cartridge Only

1CEH35 - Cartridge in body

1CEEH34 - Cartridges in dual body

2 Adjustment

F - Screw adjustment

3 Port size

Code	Port size	Housing number - body only	
		Steel single	Steel dual
3W	3/8" BSPP	B12823	B13803
8T	1/2" SAE	B11811	B11812

4 Pressure range

Note: Code based on pressure in bar.

43 - (3:1 and 5:1): 250-430 bar.
Std setting 350 bar.
Std setting made at
1 L/min

Note: Contact CSR for special pressure setting.

5 Seal material

S - Buna-N

SV - Viton

6 Pilot ratio

2 - 3:1

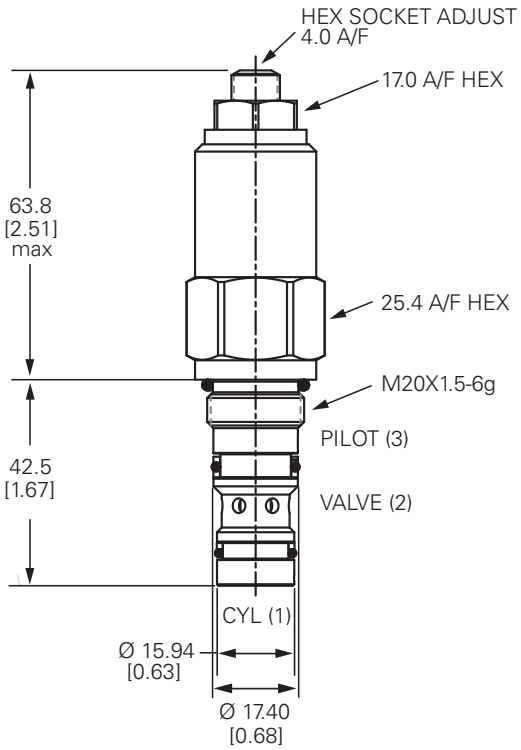
5 - 5:1

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

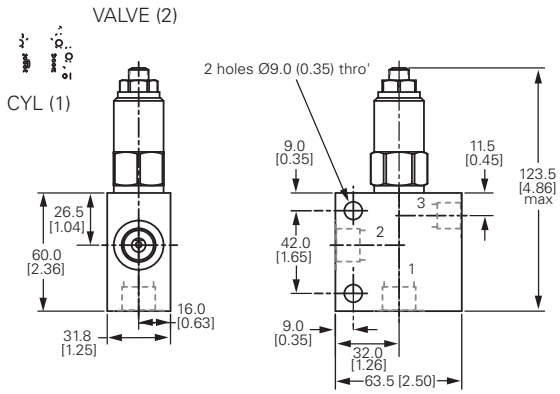
Dimensions

mm (inch)

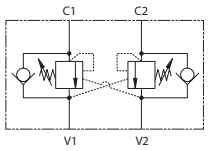
Cartridge only
Basic Code
1CEH30

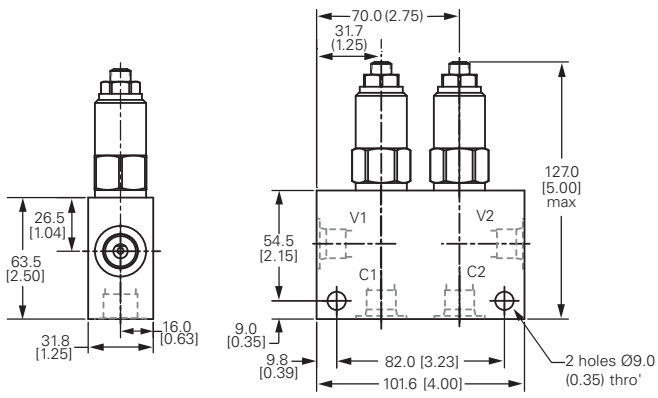


Single valve with housing
Basic Code
1CEH35



Double valve with housing
Basic Code
1CEE34



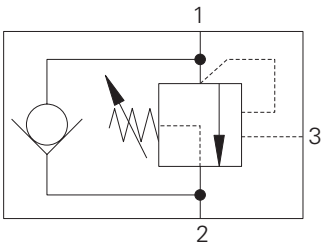


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CER30 - Overcenter valve

Part balanced, pilot assisted relief with check
30 L/min (8 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

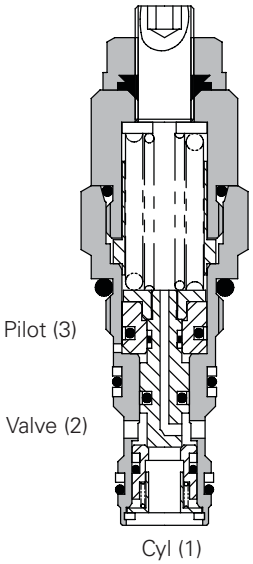
Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

2.5:1 Best suited for extremely unstable applications such as long booms or flexible frameworks.

4:1 Best suited for applications where load varies and machine structure can induce instability.

Sectional view



Description

The 1CER series overcenter valve performs all duties of a regular overcenter but is able to relieve and stay open irrespective of downstream pressure. This enables the valve to operate when used with a closed center directional valve which has service line reliefs. The poppet is pressure balanced, preventing relief setting increase due to back pressure.

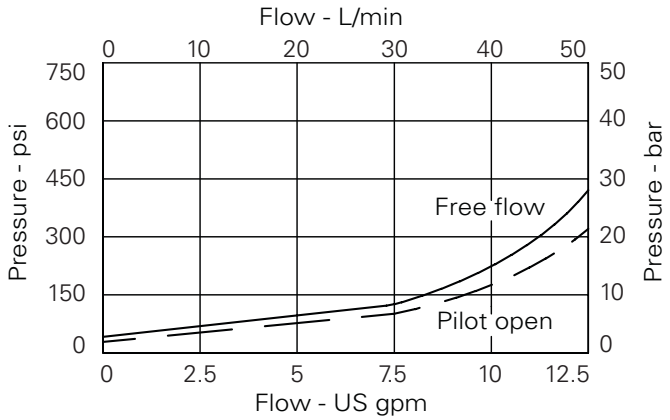
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40° C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity	A6610 (See Section M)
Torque cartridge into cavity	45 Nm (33 lbs ft)
Weight	1CER30 0.15 kg (0.33 lbs) 1CER35 0.41 kg (0.90 lbs) 1CEER34 0.90 kg (1.98 lbs)
Seal kits	SK395 (Nitrile) SK395V (Viton®)
Filtration	Cleanliness code 18/13 (25 micron nominal)
Temperature range	-30°C to +90°C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Part balanced, pilot assisted relief with check
30 L/min (8 USgpm) • 270 bar (4000 psi)

Model code

1CE****	–	F	3W	–	35	S	4
1		2	3		4	5	6

1 Basic code

1CER30 - Cartridge only

1CER35 - Cartridge and body

1CEER34 - Cartridges and dual body

2 Adjustment

F - Screw adjustment

N - Fixed - State pressure setting required.

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port sizes - bodied valves only

Code	Port size	Housing number			
Body Only		Aluminum single	Steel single	Aluminum dual	Steel dual
3W	3/8" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B6743	B12823	B6836	B13803
6T	3/8" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10536		B10805	
8T	1/2" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B7884	B11811	B30237	B11812

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - 100-350 bar. Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile

SV - Viton

6 Pilot ratio

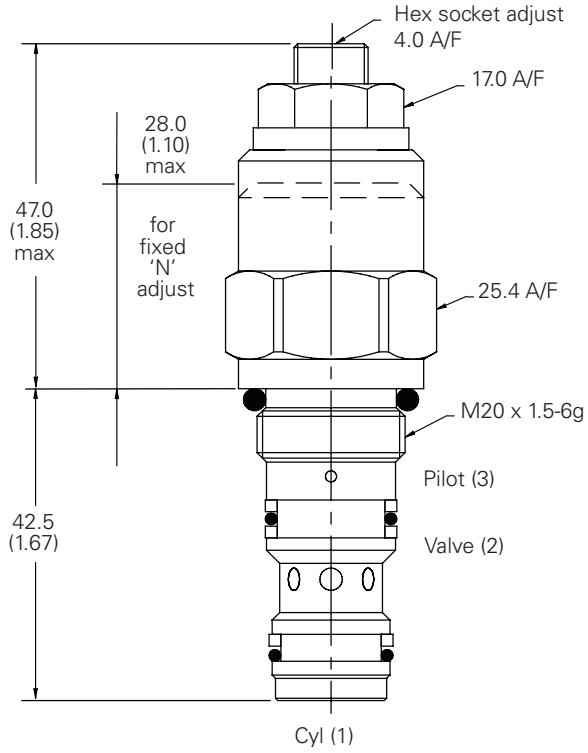
2 - 2.5:1

4 - 4:1

Dimensions

mm (inch)

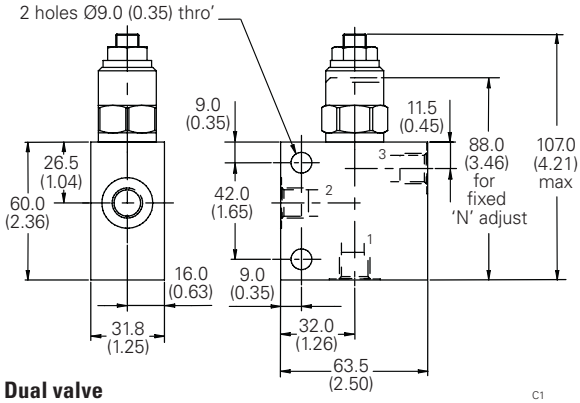
Cartridge only
Basic Code
1CER30



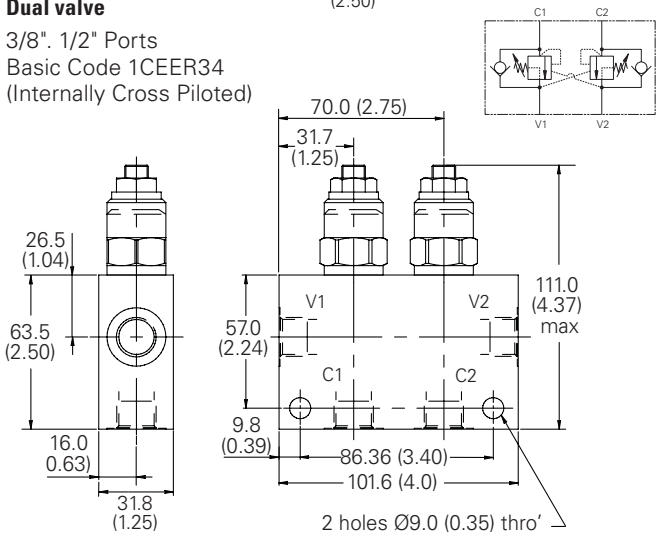
Note: For applications above 210 bar - please consult our technical department or use the steel body option

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

Single valve
3/8". 1/2" Ports
Basic Code 1CER35



Dual valve
3/8". 1/2" Ports
Basic Code 1CEER34
(Internally Cross Piloted)

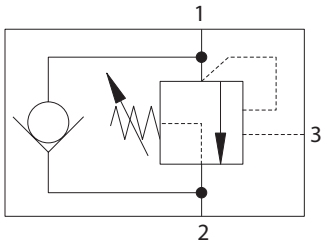


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CERH30 - High pressure overcenter valve

Pilot assisted relief with check
30L/min (8 USgpm) • 350 bar (5000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

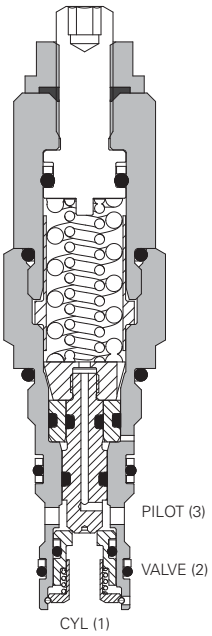
Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

3:1 Best suited for extremely unstable applications such as long booms or flexible frameworks.

5:1 Best suited for applications where load varies and machine structure can induce instability.

Sectional view



Description

The 1CERH series overcenter valve performs all duties of a regular overcenter but is able to relieve and stay open irrespective of downstream pressure. This enables the valve to operate when used with a closed center directional valve which has service line reliefs. The poppet is pressure balanced, preventing relief setting increase due to back pressure.

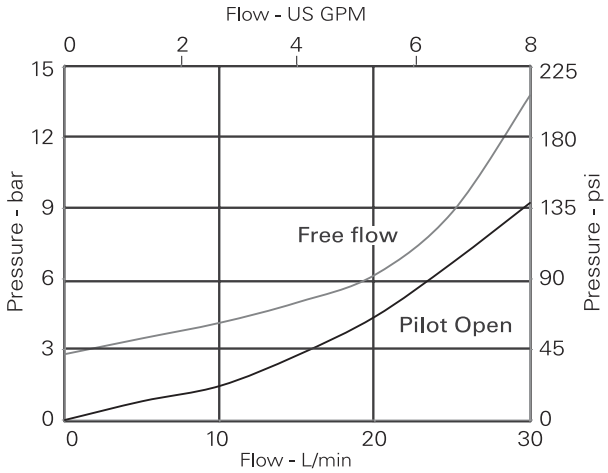
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40° C Viscosity = 32 cSt (150 SUS)		
Rated flow		30 L/min (8 USgpm)
Max relief pressure		430 bar (6240 psi)
Max load induced pressure		350 bar (5000 psi)
Cartridge material		Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material		Steel. Add suffix "377".
Mounting position		Unrestricted
Cavity		A6610 (See Section M)
Torque cartridge into cavity		68-75 Nm (50-56 lbs ft)
Weight	1CERH30 1CERH35 1CEERH34	0.2 kg (0.55 lbs) 0.51 kg (1.12 lbs) 1.0 kg (2.2 lbs)
Seal kits		9900925-000 (Nitrile) 9900926-000 (Viton®)
Filtration		Cleanliness code 18/13 (25 micron nominal)
Temperature range		-30°C to +90°C (-22° to +194°F)
Internal leakage		5 dpm @ 85% of Cracking
Nominal viscosity range		5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



3:1 and 5:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Pilot assisted relief with check
30L/min (8 USgpm) • 350 bar (5000 psi)

Model code

1CERH** – F 3W – 43 S ***

1 2 3 4 5 6

1 Basic code

1CERH30 - Cartridge only

1CERH35 - Cartridge and body

1CEER34 - Cartridges and dual body

2 Adjustment

F - Screw adjustment

3 Port sizes - bodied valves only

Code	Port size	Housing number	
Body Only		**Steel single**	**Steel dual**
3W	3/8" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B12823	B13803
8T	1/2" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B11811	B11812

4 Pressure range

Note: Code based on pressure in bar.

43 - 250-430 bar. Std setting 350 bar
Std setting made at 1 L/min

Note: Contact CSR for special pressure setting.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

5 Seals

S - Nitrile

SV - Viton

6 Pilot ratio

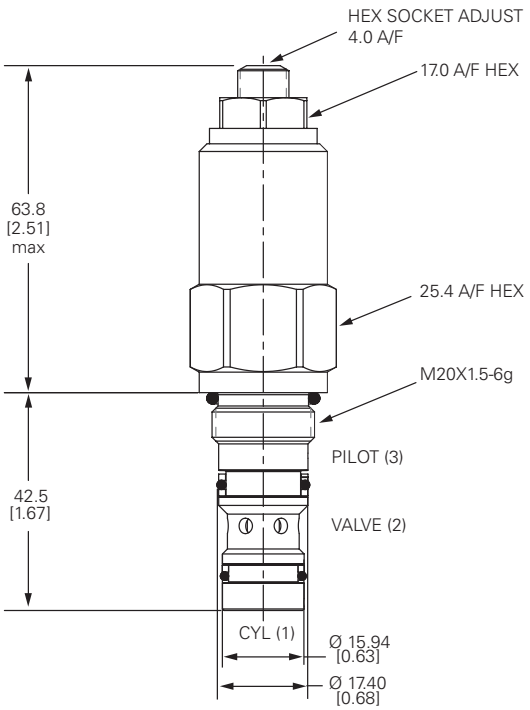
3 - 3:1

5 - 5:1

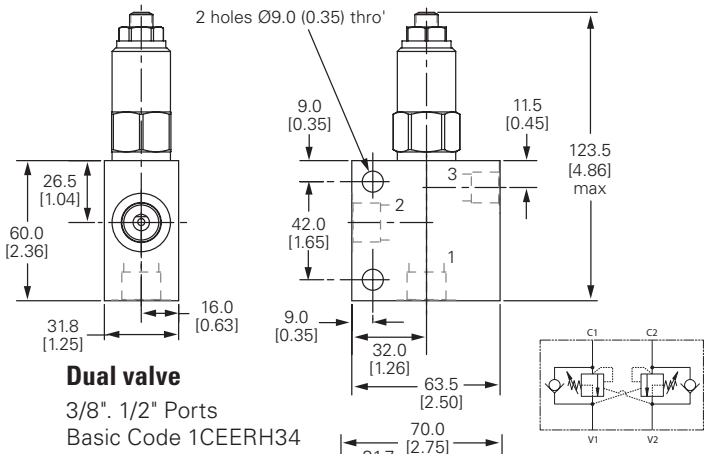
Dimensions

mm (inch)

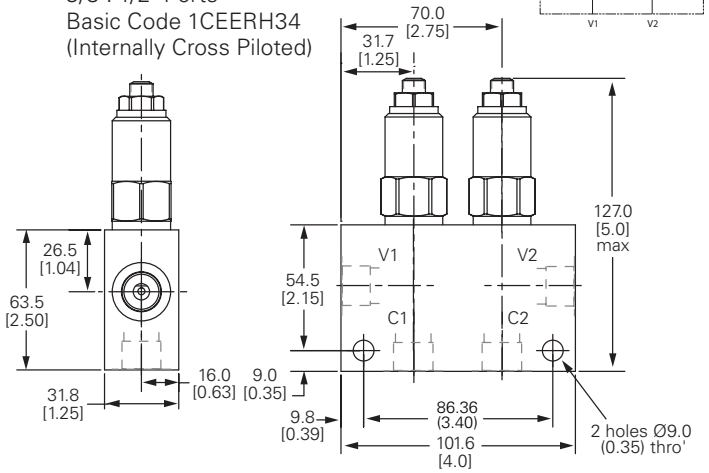
Cartridge only
Basic Code
1CERH30



Single valve
3/8". 1/2" Ports
Basic Code 1CERH35



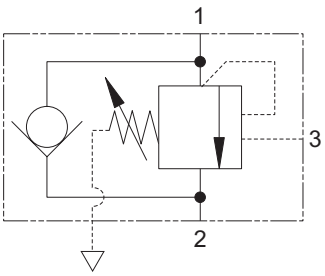
Dual valve
3/8". 1/2" Ports
Basic Code 1CEERH34
(Internally Cross Piloted)



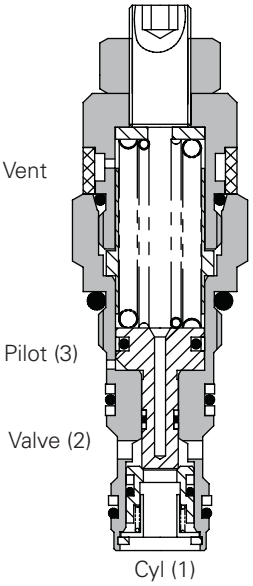
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEB30 - Overcenter valve

Fully balanced, pilot assisted, relief with check
30 L/min (8 USgpm) • 270 bar (4000 psi)



Sectional View



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They prevent runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced valve is unaffected by back pressure, allowing service line reliefs to operate and for the valve to be used in regenerative or proportional valve systems.

The overcenter valve should be mounted either into, onto or as close to the actuator as possible to give maximum protection.

Single overcenter valves control unidirectional loads such as in aerial platforms, cranes or winches and dual overcenters are suited to bi-directional motion such as wheel motor applications or cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

5.1:1 (standard) Best suited for applications where load varies and machine structure can induce instability.

Note: This valve is not suitable for high frequency applications and aggressive environmental conditions.

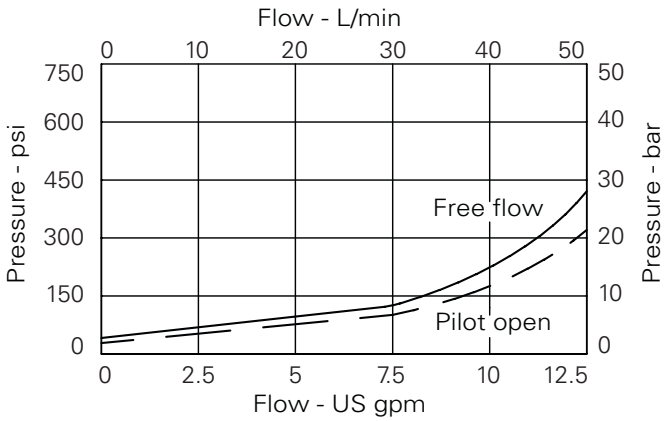
Performance data

Ratings and specifications

Figures based on: Oil Tem = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A6610 (See Section M)
Torque cartridge into cavity	45 Nm (33 lbs ft)
Weight	1CEB30 0.14 kg (0.30 lbs) 1CEB35 0.40 kg (0.88 lbs) 1CEEB34 0.88 kg (1.94 lbs)
Seal kit number	SK395 (Nitrile SK395V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30°C to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE*** – F 3W – 35 S 5

1 2 3 4 5 6

1 Function

1CEB30 - Cartridge Only
1CEB35 - Cartridge and Body
1CEEB34 - Cartridges and Dual Body

2 Adjustment means

F -Screw Adjustment

N - Fixed - State pressure setting required.

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port sizes

Code	Port size	Housing number - body only			
		Aluminium single	Steel single	Aluminium dual	Steel dual
3W	3/8" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B6743	B12823	B6836	B13803
6T	3/8" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10536		B10805	
8T	1/2" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B7884	B11811	B30237	B11812

4 Pressure range

@ 4.8 L/min

Note: Code based on pressure in bar.

35 - 100-350 bar.
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S -Nitrile (For use with most industrial hydraulic oils)

SV -Viton (For high temperature and most special fluid applications)

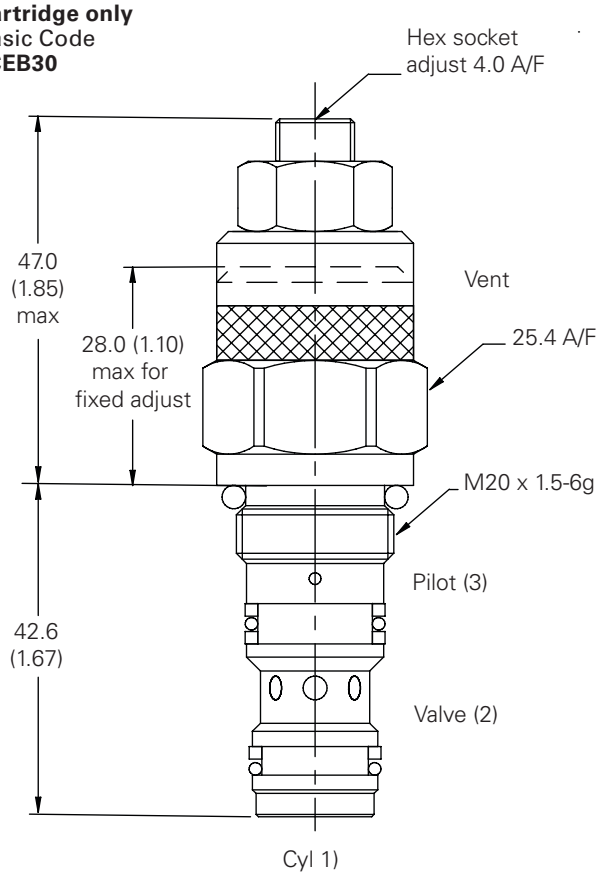
6 Pilot ratio

5 - 5:1

Dimensions

mm (inch)

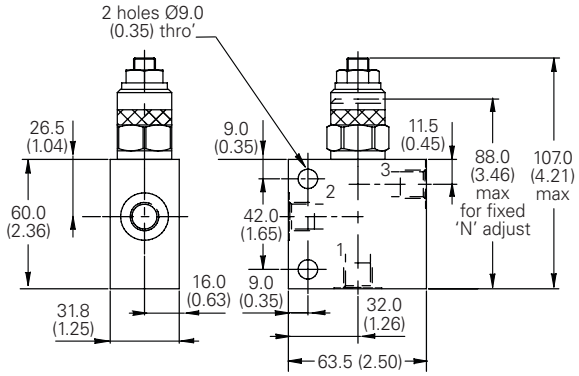
Cartridge only
Basic Code
1CEB30



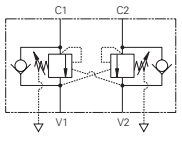
Note: For applications above 210 bar - please consult our technical department or use the steel body option

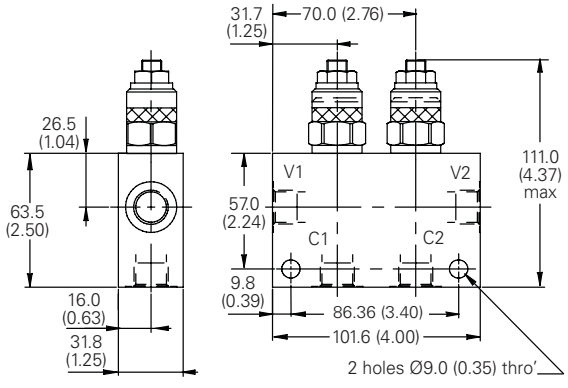
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

Single valve
3/8". 1/2" Ports
Basic Code
1CEB35



Dual valve
3/8". 1/2" Ports
Basic Code
1CEEB34
Internally Cross Piloted

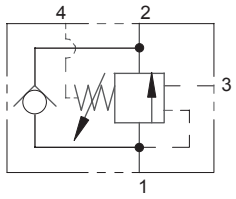




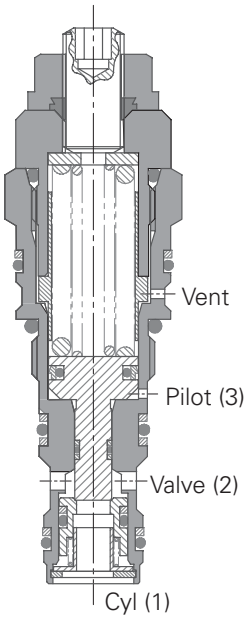
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBD30 - Overcenter valve

Fully balanced, pilot assisted, relief
30 L/min (8 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They prevent runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced valve is unaffected by back pressure, allowing service line reliefs to operate and for the valve to be used in regenerative or proportional valve systems.

The overcenter valve should be mounted either into, onto or as close to the actuator as possible to give maximum protection.

Single overcenter valves control unidirectional loads such as in aerial platforms, cranes or winches and dual overcenters are suited to bi-directional motion such as wheel motor applications or cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve.

For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple 'dual purpose' cavity. Allows quick, easy field service - reduces down time. Directly interchangeable with 30 litres/min pilot check valve.

Pilot ratio

5.1:

Performance data

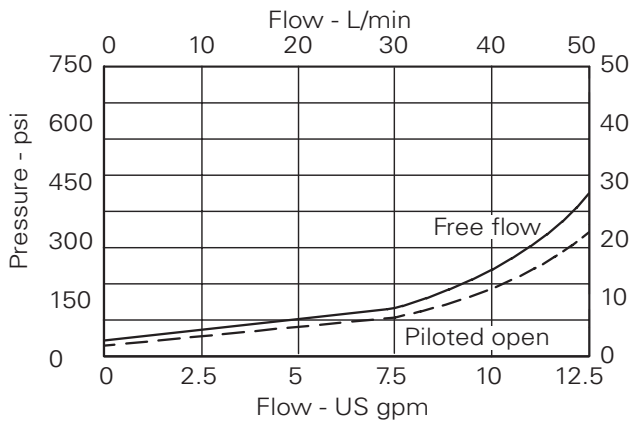
Ratings and specifications

Figures based on Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure*	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Mounting position	Unrestricted
Cavity	A20530 (See section M)
Torque cartridge into cavity	45 Nm (33 lbs ft)
Weight	0.14 kg (0.30 lbs)
Seal kit	SK1159 (Nitrile) SK1159V (Viton®) SK634P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-20° to +90°C (-4° to +194°F)
Leakage	0.3 milliliters/min (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

*For applications above 210 bar please consult our technical department or use the steel body option.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CEBD30 – F 35 – S 5

1 2 3 4 5

1 Function

1CEBD30 - Cartridge Only

2 Adjustment

F - Screw adjustment

3 Pressure range @4.8L/min

Note: Code based on pressure in bar.

20 - 70-210 bar. Standard setting 100 bar

20 - 100-350 bar.

Standard setting made at 4.8 L/min

4 Seal

S - Nitrile (for use with most industrial hydraulic oils)

SV - Viton (for high temperature and most special fluid applications)

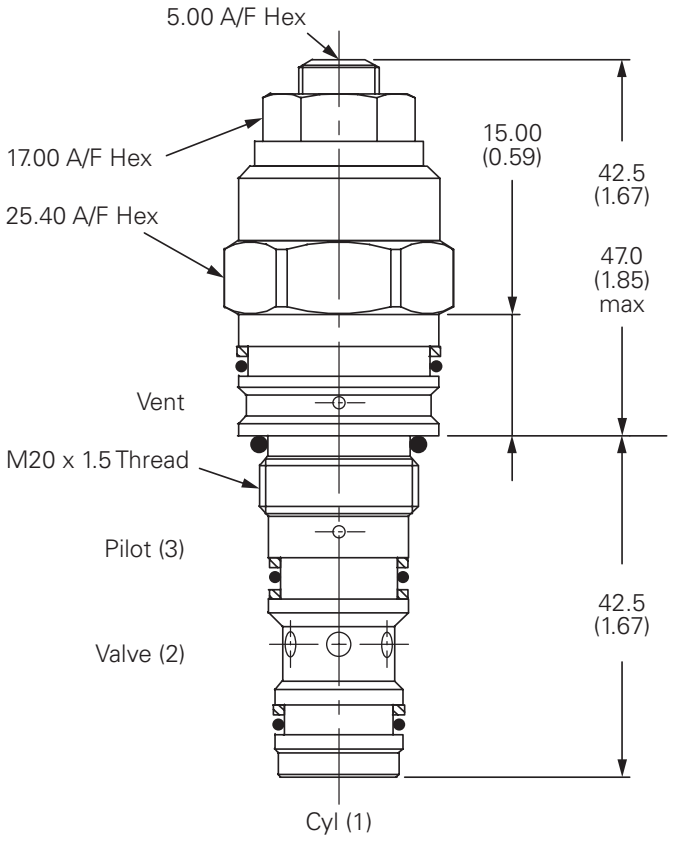
5 Pilot ratio

5 - 5:1

Dimensions

mm (inch)

Cartridge only
Basic Code
1CEBD30

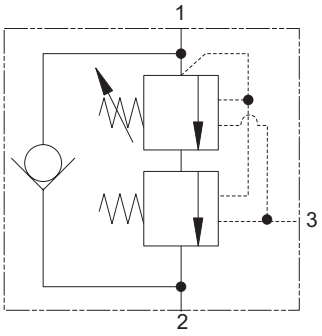


F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEL30 - Overcenter valve

Counterbalance pilot assisted relief with check
30 L/min (8 USgpm) • 380 bar (5510 psi)



Operation

The check section allows free flow and then locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied, maintaining a counterbalance pressure to prevent initial pressure loss and therefore instability. The total pressure setting will normally be set at 1.3 times the load induced pressure. The counterbalance pressure reduces as the pilot pressure increases.

Features

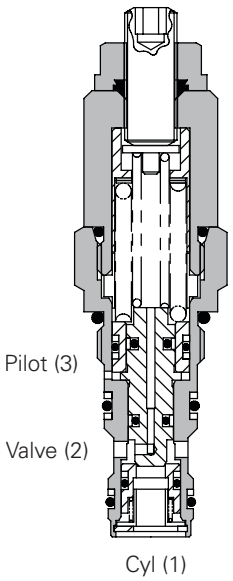
Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

Primary 4.3:1

Secondary 0.4:1

Sectional view



Description

The 1CEL overcenter valve performs all duties of a regular overcenter but maintains a counterbalance pressure to provide dampening of cylinders when there is a rapid loss in stored pressure. This counterbalance pressure reduces as the pilot pressure increases. Typical applications include extension cylinders on telescopic handlers where it is important to have a smooth operation when retracting from full extension.

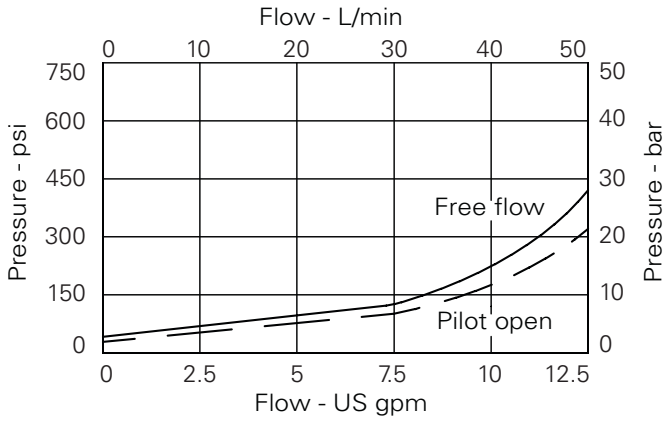
Performance data

Ratings and specifications

Performance data is typical with fluid at 32 cST (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max setting	380 bar (5510 psi)
Internal leakage	0.3 ml/min (5 dpm)
Temperature range	-30° to +90°C (-22° to +194°F)
Cavity	A6610 (see Section M)
Torque cartridge into cavity	45 Nm (33 lbs ft)
Mounting position	Unrestricted
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Nominal viscosity range	5 to 500 cSt
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Aluminium up to 210 bar. Add suffix "377" for steel option.
Weight	0.15 kg (0.33 lbs)
Seal kit	SK395 (Nitrile) SK395V (Viton®)

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Note: This valve has been designed to eliminate instability from flexible boom applications or where he load induced pressure varies greatly. To get the best results, the settings should be adjusted for each application and then factory set for production quantities. Please contact our Technical Department for more information.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE** – F 3W – 30 S 230 / 50**

1 2 3 4 5 6 7

1 Function

1CEL30 - Cartridge only

1CEL35 - Cartridge and body

1CEEL34 - Cartridges and dual body

2 Adjustment means/ counterbalance setting

F - Screw adjustment

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

Code	Port size	Housing number - body only			
		Aluminium single	Steel single	Aluminium dual	Steel dual
3W	3/8" BSP valve & cylinder port. 1/4" BSP pilot port	B6743	B12823	B6836	B13803
6T	3/8" SAE valve & cylinder port. 1/4" SAE pilot port	B10536	B10805		
8T	1/2" SAE valve & cylinder port. 1/4" SAE pilot port	B7884	B11811	B30237	B11812

4 Pressure range bar @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 170-300 bar.
Std setting 220 bar

30 - 240-370 bar.
Std setting 280 bar

40 -270-380 bar.
Std setting 350 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile

SV - Viton

6 High pressure setting bar

10 bar increments
150 to 310 bar
(2175 to 5000 psi)

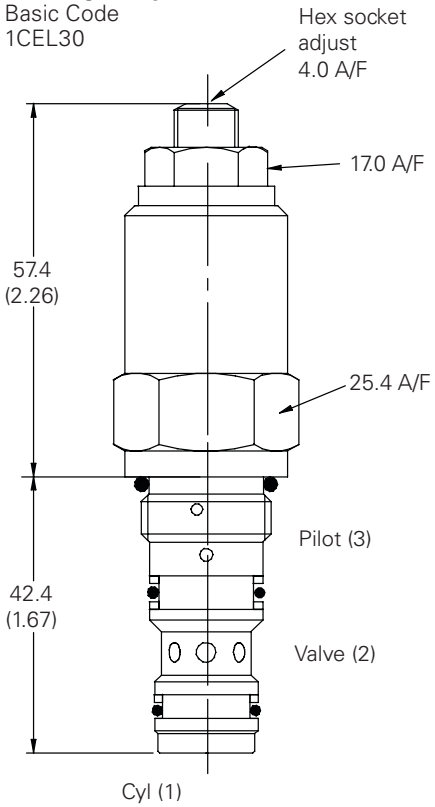
7 Counterbalance setting bar

10 bar increments
20 to 120 bar (300 to 1740 psi)

Dimensions

mm (inch)

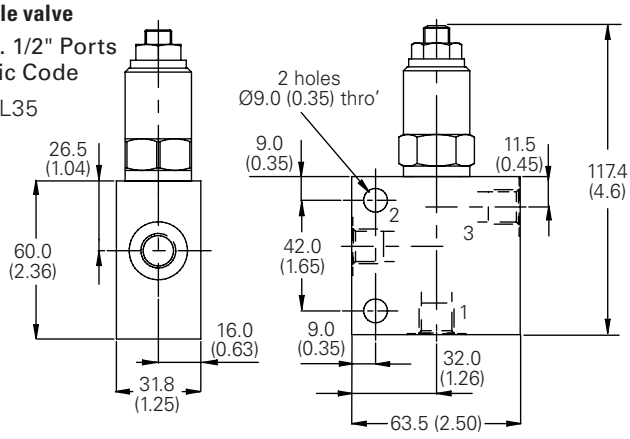
Cartridge only
Basic Code
1CEL30



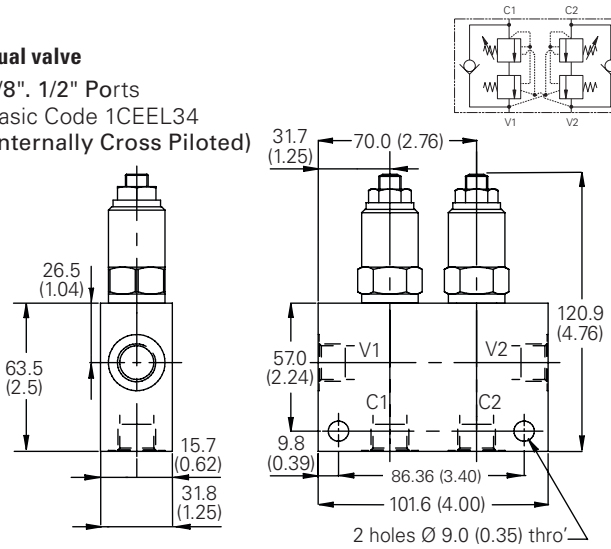
Note: Tightening torque of "F" adjuster locknut= 20-25 Nm.

Note: For applications above 210 bar - please consult our technical department or use the steel body option

Single valve
3/8". 1/2" Ports
Basic Code
1CEL35



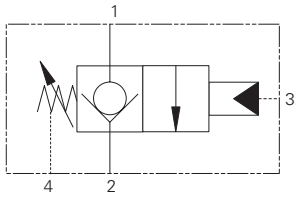
Dual valve
3/8". 1/2" Ports
Basic Code 1CEEL34
(Internally Cross Piloted)



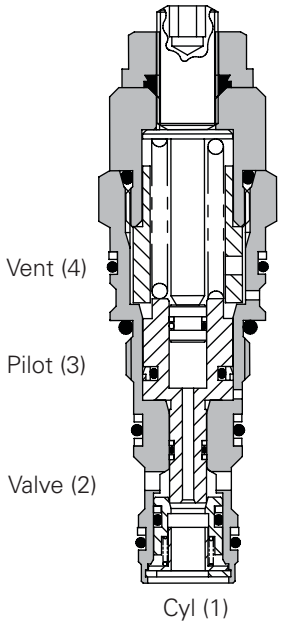
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CPBD30 - Overcenter valve

Zero differential with check
30 L/min (8 USgpm) • 350 bar (5000 psi)



Sectional view



Description

Zero differential overcenter valves give static and dynamic control of loads by supplying a restriction to flow related to the opening of the valve created by the pilot pressure.

The valve is used in conjunction with a remote pilot source to provide hose failure protection, load control and load holding functions.

If over-pressure or shock pressure protection is required then a separate relief valve should be used

The drain line allows the valve to be used in corrosive atmospheres preventing the ingress of atmospheric contaminant.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. By the application of pilot pressure to the pilot port the poppet moves back against the main spring opening the cylinder port to the valve port. The metering characteristic of the valve is controlled by the rate of the spring, the seat angle and the pilot pressure applied.

Due to the balanced poppet design load induced pressure will not open the valve and once open valve port pressure will not increase the pilot pressure required to keep the valve open

Features

The cartridge fits a simple cavity allowing quick, easy field service reducing down time. Hardened poppet and seat provide for long leak free performance.

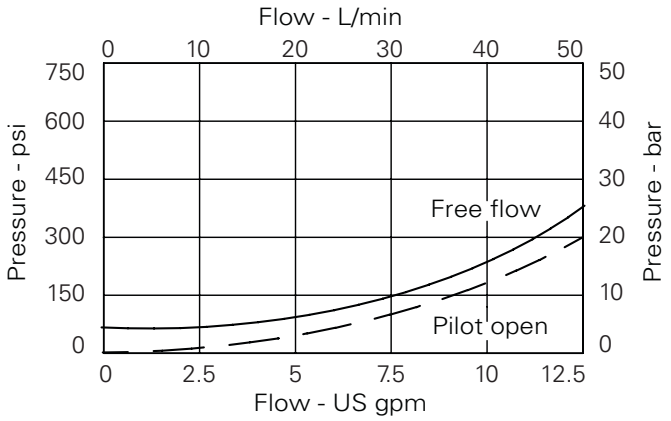
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max working pressure	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Mounting position	Unrestricted
Cavity	AXP20530 (See Section M)
Torque cartridge into cavity	45 Nm (33 lbs ft)
Weight	0.15 kg (0.33 lbs)
Seal kit	SK1159 (Nitrile) SK1159V (Viton®) SK1159P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 milliliters/min max (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CPBD30 – F – 2 P

1 2 3 4

1 Function

1CPBD30 - Cartridge only

2 Adjustment

F - Screw adjustment

3 Pilot adjust range

Note: Code based on pressure in bar.

2 - 5-20 bar. Std setting 10 bar

Std setting made at 4.8 L/min

4 Seal material

S - Nitrile (For use with most industrial hydraulic oils)

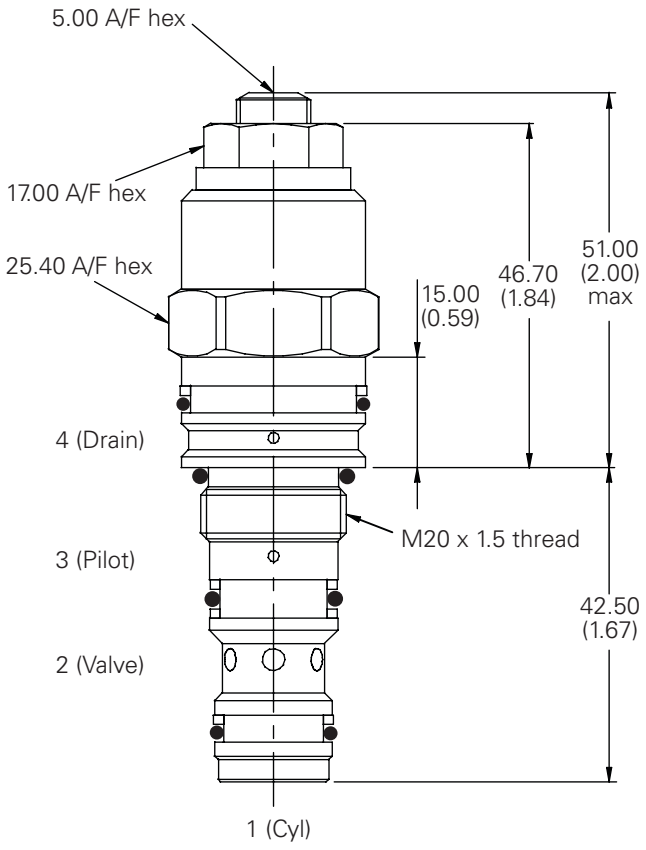
SV - Viton (For high temperature and most special fluid applications)

P -Polyurethane/Nitrile (For arduous applications)

Dimensions

mm (inch)

Cartridge only
Basic Code 1CPBD30



Note: Tightening torque of "F" adjuster locknut= 20-25 Nm.

1CE Series - Overcenter valve

Alternative body arrangements for 30 L/min valves

Model code

1C*** – F 3W – 35 S 5 230 / 50**

1 2 3 4 5 6 7 8

1 Function

1CE36/1CEB36/1CER36/1CEL36 - Cartridge & Body Through Ported

1CBE35/1CBEB35/1CBER35/1CBEL35 - Cartridge & Body Banjo

1CEG35/1CEBG35/1CERG35/1CELG35 - Cartridge & BodyGasket

1CEE35/1CEEB35/1CEER35/1CEEL35 - Cartridges & Dual Body

2 Adjustment means

F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port sizes

Code	Port size	Housing number	
		Aluminium	**Steel**
Through Ported			
3W	3/8" BSP - Body ONLY	B13542	B13543
Banjo Mounted			
3W	3/8" BSP - Sub Assembly	AXP13617-3W-S	
Gasket Mounted			
3W	3/8" BSP - Sub Assembly	BXP13621-3W-S	
Dual Overcenter (Internally Cross Piloted)			
3W	3/8" BSP - Sub Assembly	BXP24147-3W-S	BXP24147-3W-S-377
6T	3/4" SAE - Sub Assembly	BXP24147-6T-S	

4 Pressure range @ 4.8 L/min

See cartridge data sheet

5 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot ratio

(omit for 1CEL30 based options)

2 - 2.5:1 **4** - 4:1
5 - 5:1 **10** - 10:1
(See cartridge details)

7 High pressure setting

(1CEL30 based options only)

bar in 10 bar increments.

8 Counterbalance setting

(1CEL30 based options only)

bar in 10 bar increments.

F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

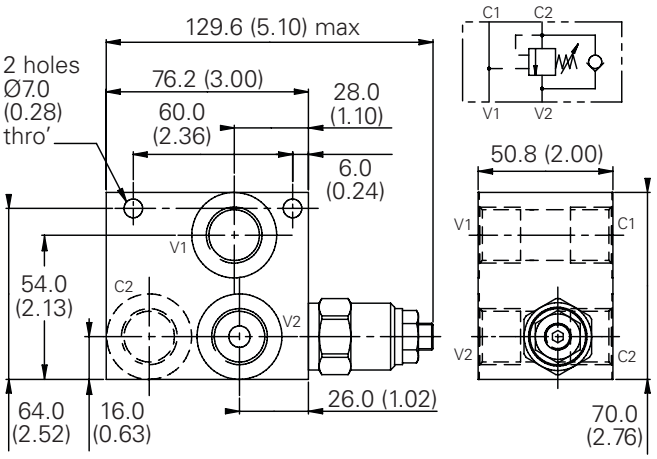
mm (inch)

Complete valve - through ported

3/8" Ports
Basic Code

1CE36/1CEB36/1CER36/1CEL36

Banjo Bolt torque - 47 Nm

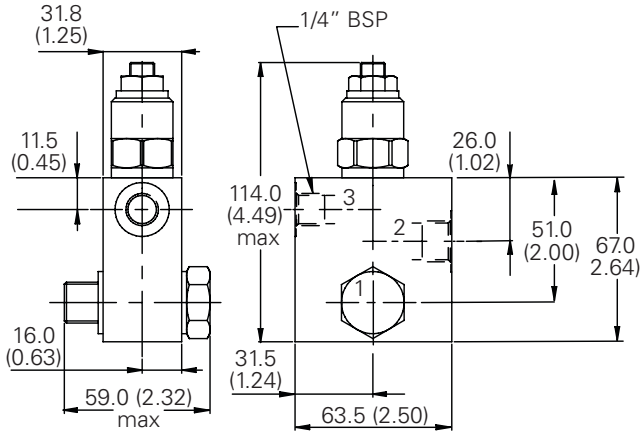


Complete valve - banjo mounted

3/8" Ports
Basic Code

1CBE35 / 1CBEB35 / 1CBER35 / 1CBEL35

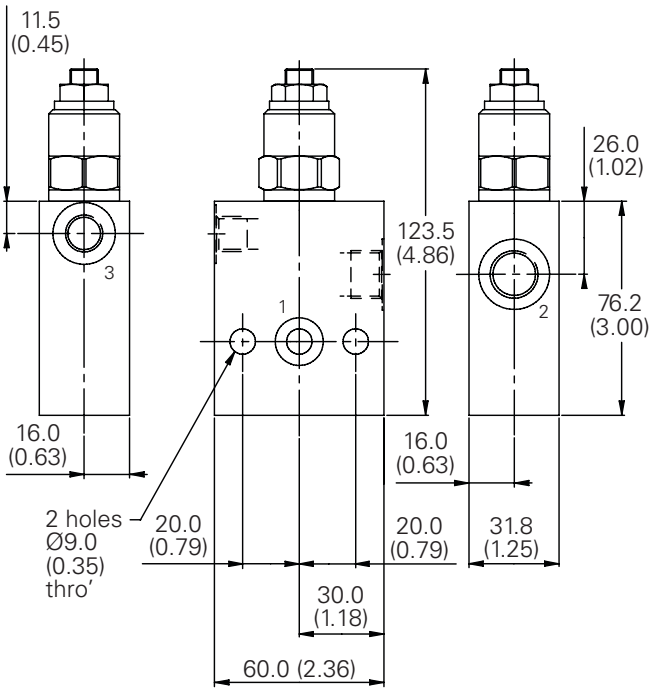
Banjo Bolt torque - 47 Nm



Complete valve - gasket mounted

3/8" Ports
Basic Code

1CEG35/1CEBG35/1CERG35/1CELG35



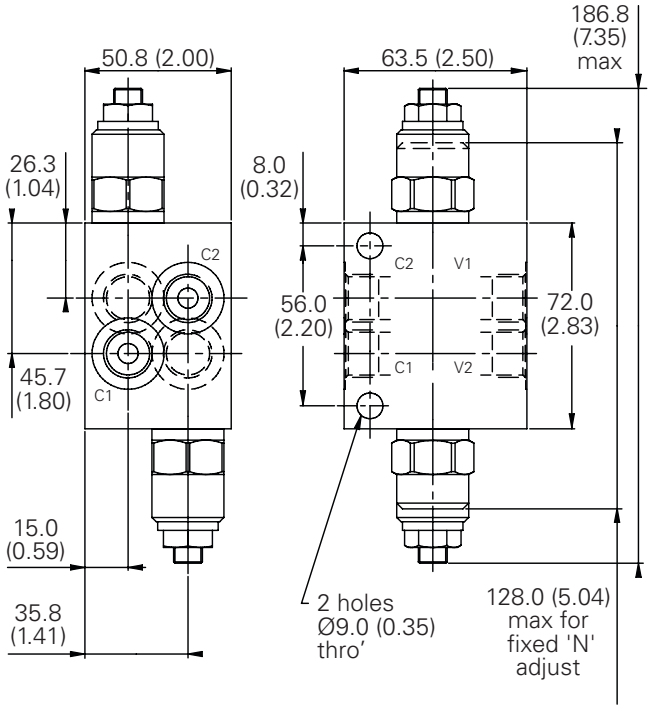
Note: Tightening torque of "F" adjuster locknut= 20-25 Nm.

Complete valve - dual overcenter

3/8" Ports
Basic Code

1CEE35/1CEEB35/1CEER35/1CEEL35

(Internally Cross-Piloted)

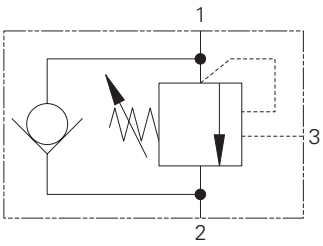


F

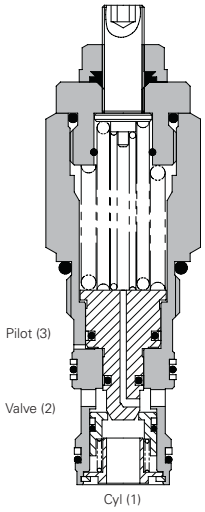
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CE90 - Overcenter valve

Pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

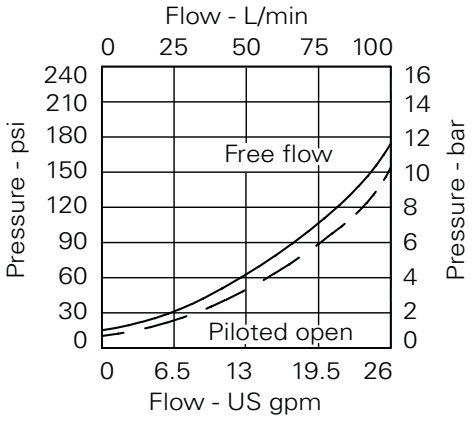
Performance data

Ratings and specifications

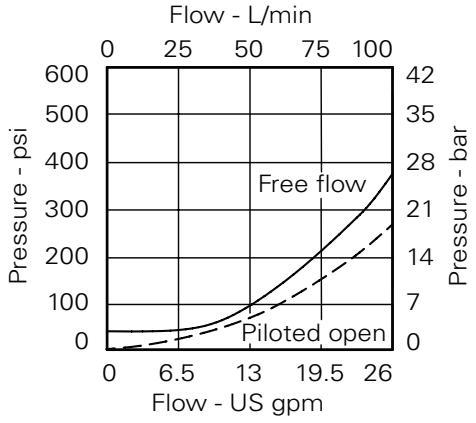
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max relief setting	350 bar (5000 psi).
Max load Induced pressure	270 bar (4000 psi).
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A12336 (See Section M)
Torque cartridge into cavity	60 Nm (44 lbs ft)
Weight	1CE90 0.29 kg (0.63 lbs) 1CE95 1.35 kg (2.97 lbs) 1CEE95 2.10 kg (4.62 lbs)
Seal kit number	SK633 (Nitrile) SK633V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



4:1 Version



8:1 Version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE***–	F	4W –	35	S	4
1	2	3	4	5	6

1 Function

1CE90 - Cartridge Only

1CE95 - Cartridge and Body

1CEE95 - Cartridges and Dual Body

2 Adjustment means

F - Screw Adjustment

N - Fixed - State pressure setting required.

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port Sizes

Code	Port size	Housing number - body only			
Body only		Aluminum single	Steel single	Aluminum dual	Steel dual
4W	1/2" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B13625	B13626	C13627	C13628
8T	1/2" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10806	B10922	C10807	C11561

4 Pressure range @ 4.8 l/min

Note: Code based on pressure in bar.

20 - 70-225 bar.
Std setting 100 bar

35 - 200-350 bar.
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot Ratio

4 - 4:1

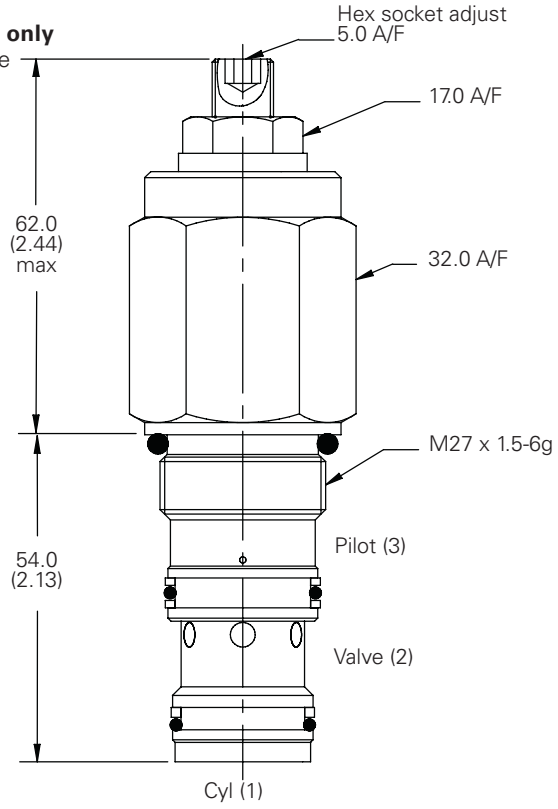
8 - 8:1

Other ratios available upon request

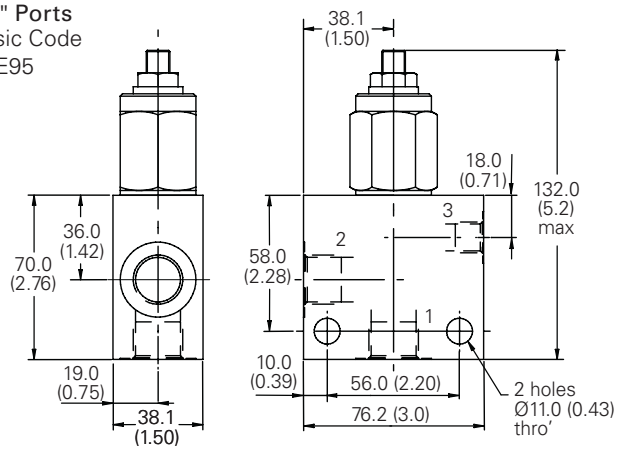
Dimensions

mm (inch)

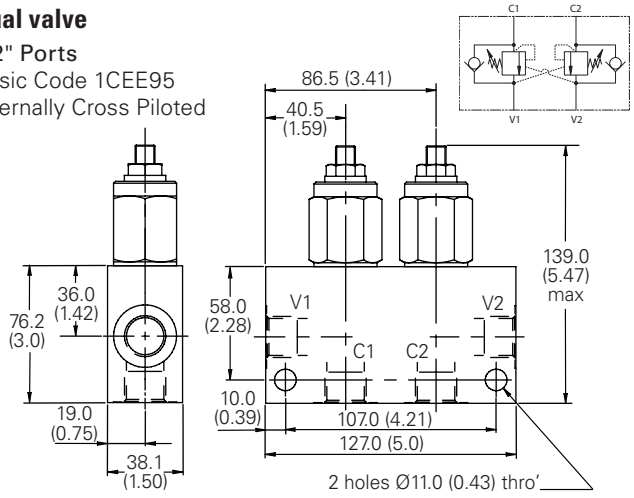
Cartridge only
Basic Code
1CE90



Single valve
1/2" Ports
Basic Code
1CE95



Dual valve
1/2" Ports
Basic Code 1CEE95
Internally Cross Piloted



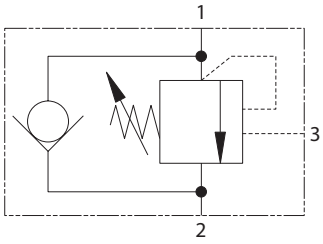
Note: For applications above 210 bar - please consult our technical department or use the steel body option

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

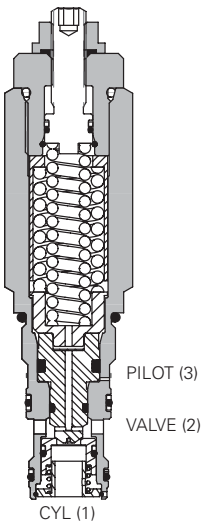
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEH90 - High pressure overcenter valve

Pilot assisted relief with check
90 L/min (23 USgpm) • 350 bar (5000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcente valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Dynamic seals on the internal moving parts to provide longer fatigue life.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

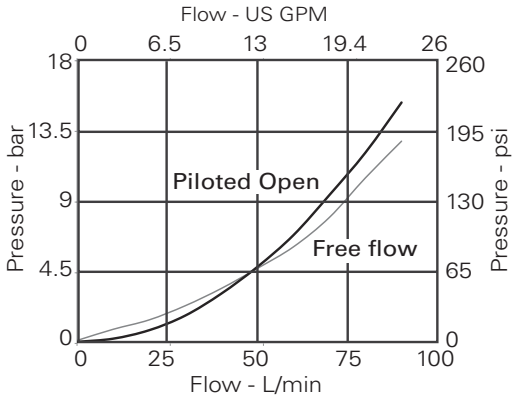
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max relief setting	430 bar (6240 psi).
Max load Induced pressure	350 bar (5000 psi).
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Steel. Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A12336 (See Section M)
Torque cartridge into cavity	100-110 Nm (73-81 lbs ft)
Weight	1CEH90 0.6 kg (1.32 lbs) 1CEH95 1.66 kg (3.66 lbs) 1CEEH95 2.72 kg (6.00 lbs)
Seal kit number	9900927-000 (Nitrile) 9900928-000 (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	5 dpm @ 85% of Cracking
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



4:1 Version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEH90 - High pressure overcenter valve

Pilot assisted relief with check
90 L/min (23 USgpm) • 350 bar (5000 psi)

Model code

1CEH* – F 4W – 43 S 4**

1 2 3 4 5 6

1 Function

1CEH90 - Cartridge Only

1CEH95 - Cartridge and Body

1CEEH95 - Cartridges and Dual Body

2 Adjustment means

F - Screw Adjustment

3 Port sizes

Code	Port size	Housing number - body only	
		Steel single	Steel dual
4W	1/2" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B13626	C13628
8T	1/2" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10922	C11561

4 Pressure range

Note: Code based on pressure in bar.

43 - (4:1) 275 - 430 bar. Std setting 350 bar

Std setting made at 1 L/min

Note: Contact CSR for special pressure setting requirement

Note: Co Tightening torque of "F" adjuster locknut - 20 to 25 Nm

5 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot Ratio

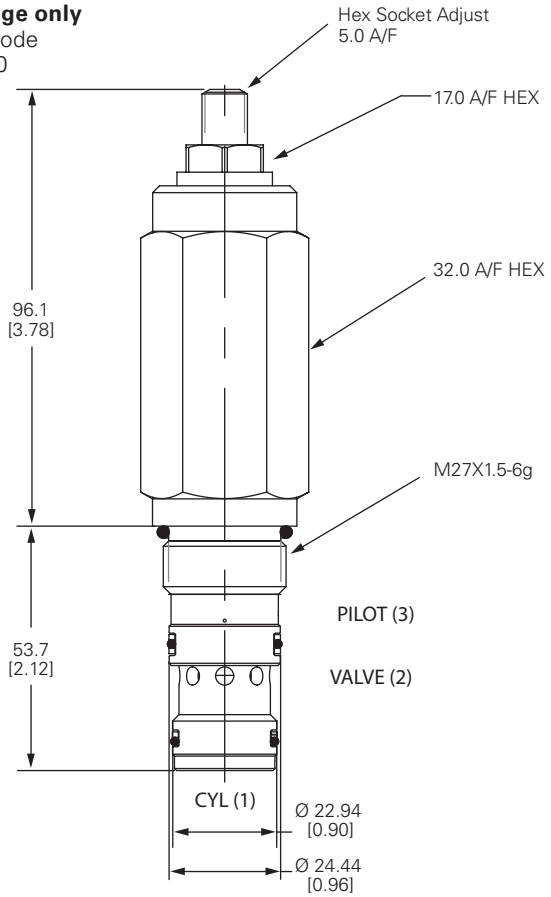
4 - 4:1

Other ratios available upon request

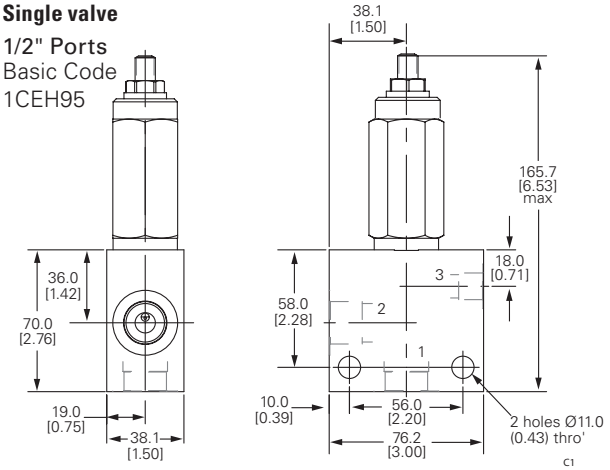
Dimensions

mm (inch)

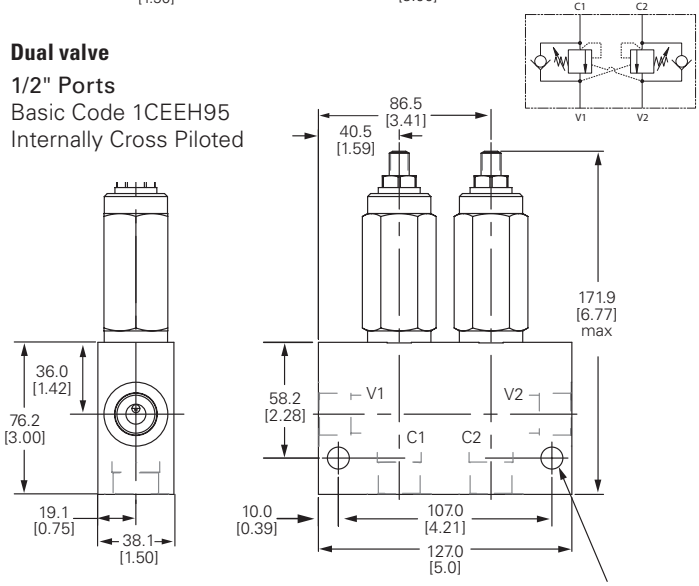
Cartridge only
Basic Code
1CEH90



Single valve
1/2" Ports
Basic Code
1CEH95



Dual valve
1/2" Ports
Basic Code 1CEEH95
Internally Cross Piloted

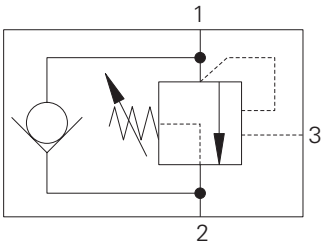


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

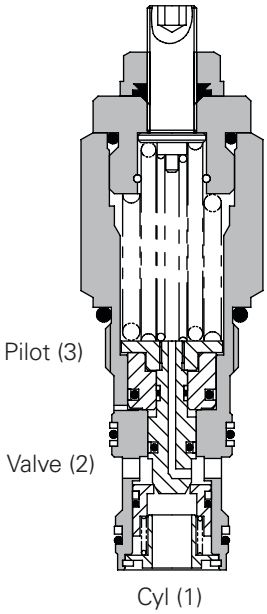
F

1CER90 - Overcenter valve

Part balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)



Sectional view



Description

The 1CER series overcenter valve performs all duties of a regular overcenter but is able to relieve and stay open irrespective of downstream pressure. This enables the valve to operate when used with a closed center directional valve which has service line reliefs. The poppet is pressure balanced, preventing relief setting increase due to back pressure.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

Other ratios available upon request.

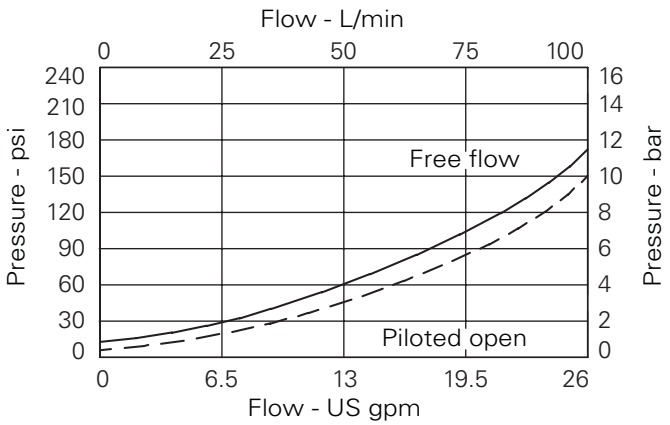
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Aluminum up to 210 bar. Add suffix "377" for steel option.
Cavity	A12336 (see Section M)
Mounting position	Unrestricted
Torque cartridge into cavity	60 Nm (44 lbs ft)
Weight	1CER90 29 kg (.63 lbs) 1CER95 1.35 kg (2.97 lbs) 1CEER95 2.10 kg (4.62 lbs)
Seal kit	SK633 (Nitrile) SK633V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 ml/min (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Part balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)

Model code

1CE****	–	F	4W	– 35	S	4
1		2	3	4	5	6

1 Function

1CER90 - Cartridge only

1CER95 - Cartridge and body

1CEER95 - Cartridges and body

2 Adjustment

F - Screw adjustment

N - Fixed - State pressure setting required.

For fixed versions add setting in 10 bar increments to end of part number. Subject to a +/-10% tolerance.

3 Port size

Code	Port size	Housing number - body only			
		Aluminum single	Steel single	Aluminum dual	Steel dual
4W	1/2" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B13625	B13626	C13627	C13628
8T	1/2" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10806	B10922	C10807	C11561

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 70-225 bar. Std setting 100 bar

35 - 200-350 bar. Std setting 210 bar

Std setting made at 4.8 L/min

5 Seal material

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

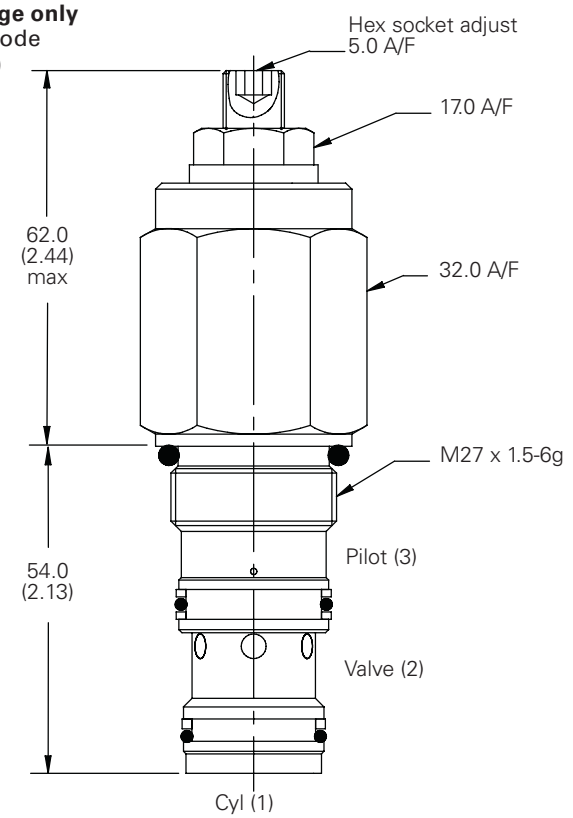
6 Pilot ratio

4 - 4:1 Other ratios available upon request

Dimensions

mm (inch)

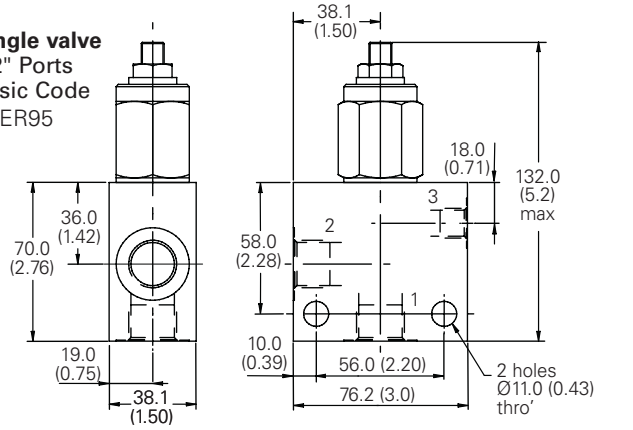
Cartridge only
Basic Code
1CER90



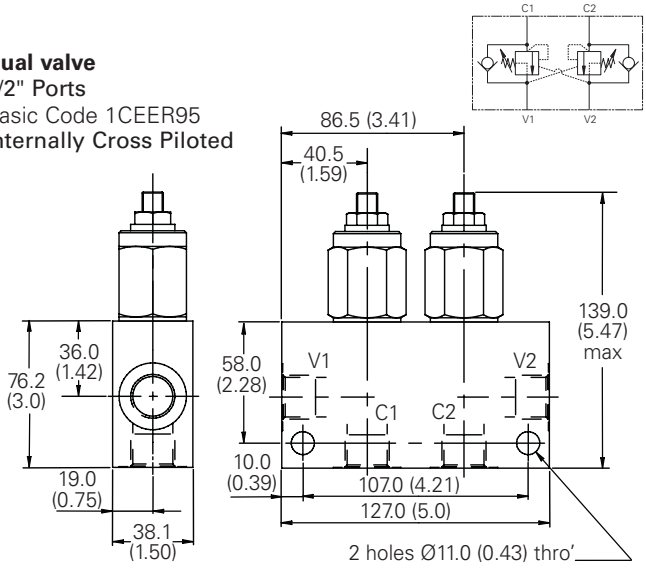
Note: For applications above 210 bar - please consult our technical department or use the steel body option.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Single valve
1/2" Ports
Basic Code
1CER95



Dual valve
1/2" Ports
Basic Code 1CEER95
Internally Cross Piloted

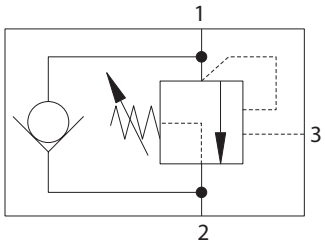


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

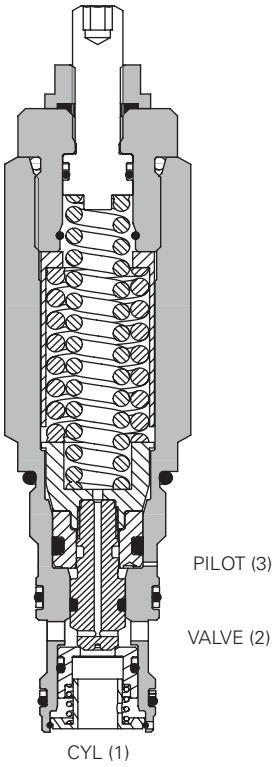
F

1CERH90 - High pressure overcenter valve

Part balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 350 bar (5000 psi)



Sectional view



Description

The 1CERH series overcenter valve performs all duties of a regular overcenter but is able to relieve and stay open irrespective of downstream pressure. This enables the valve to operate when used with a closed center directional valve which has service line reliefs. The poppet is pressure balanced, preventing relief setting increase due to back pressure.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Dynamic seals on the internal moving parts to provide longer fatigue life.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

Other ratios available upon request.

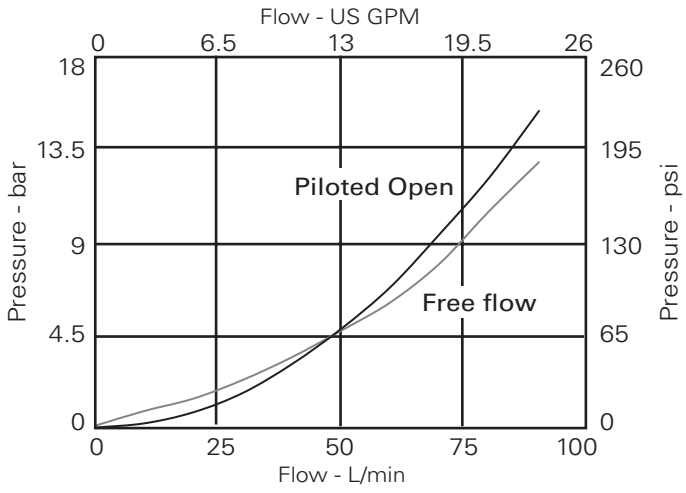
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max relief pressure	430 bar (6240 psi)
Max load induced pressure	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Steel. Add suffix "377".
Cavity	A12336 (see Section M)
Mounting position	Unrestricted
Torque cartridge into cavity	100-110 Nm (73-81lbs ft)
Weight	1CERH90 0.6 kg (1.32 lbs) 1CERH95 1.66 kg (3.66 lbs) 1CEERH95 2.72 kg (6.00 lbs)
Seal kit	9900927-000 (Nitrile) 9900928-000 (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	5 dpm @ 85% of Cracking
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CERH90 - High pressure overcenter valve

Part balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 350 bar (5000 psi)

Model code

1CERH* – F 4W – 43 S 4**

1 2 3 4 5 6

1 Function

1CERH90 - Cartridge only

1CERH95 - Cartridge and body

1CEERH95 - Cartridges and body

2 Adjustment

F - Screw adjustment

3 Port size

Code	Port size	Housing number - body only	
		Steel single	Steel dual
4W	1/2" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B13626	C13628
8T	1/2" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10922	C11561

4 Pressure range

Note: Code based on pressure in bar.

43 - (4:1) 275-430 bar. Std setting 350 bar

Std setting made at 1L/min

Note: Contact CSR for special pressure setting requirement

Note: Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

5 Seal material

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot ratio

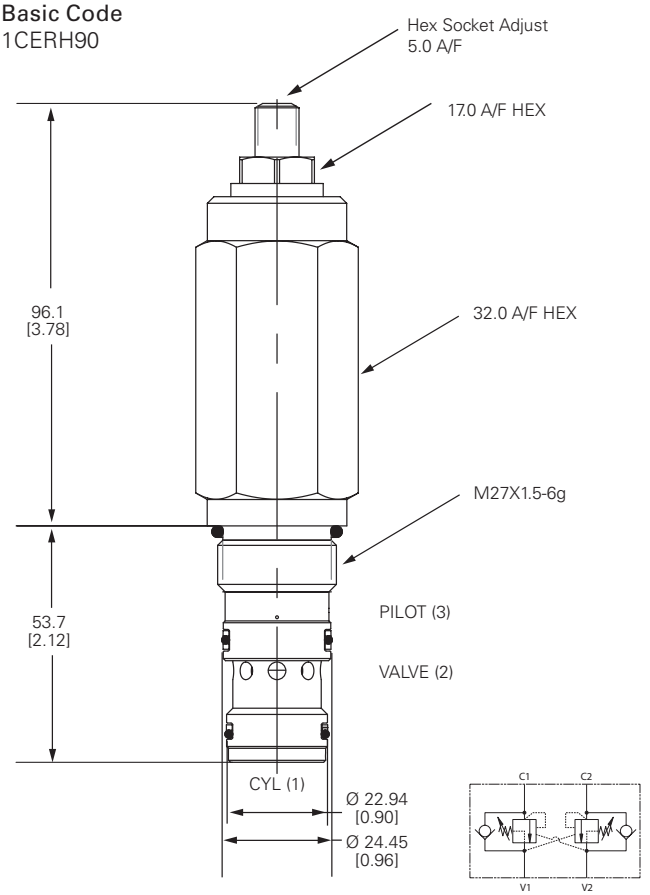
4 - 4:1 Other ratios available upon request

F

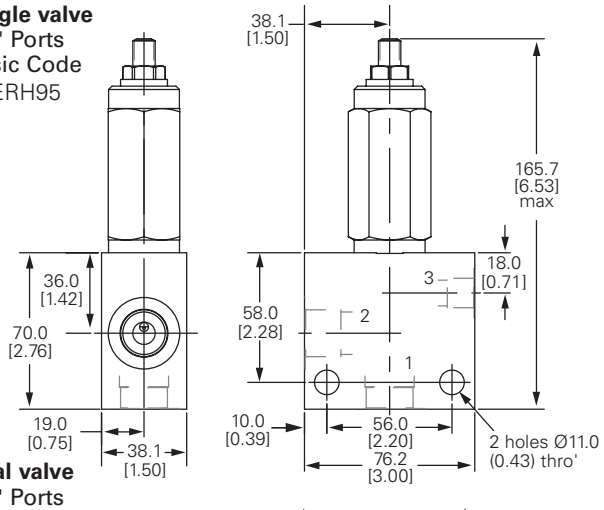
Dimensions

mm (inch)

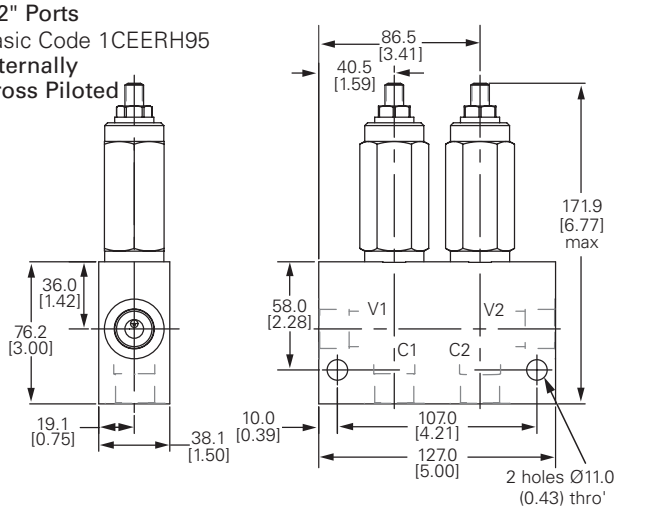
Cartridge only
Basic Code
1CERH90



Single valve
1/2" Ports
Basic Code
1CERH95



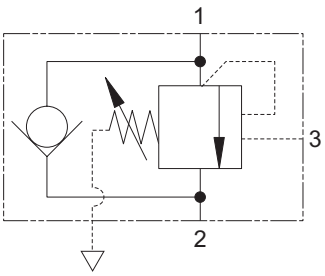
Dual valve
1/2" Ports
Basic Code 1CEERH95
Internally
Cross Piloted



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEB90 - Overcenter valve

Fully balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

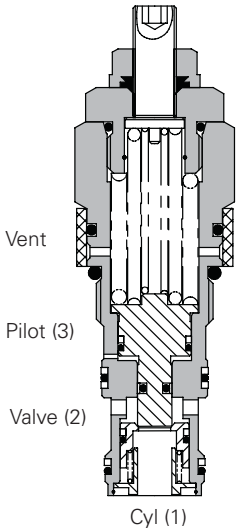
Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

Other ratios available upon request.

Sectional view



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They prevent runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced valve is unaffected by back pressure, allowing service line reliefs to operate and for the valve to be used in regenerative or proportional valve systems.

The overcenter valve should be mounted either into, onto or as close to the actuator as possible to give maximum protection.

Single overcenter valves control unidirectional loads such as in aerial platforms, cranes or winches and dual overcenters are suited to bi-directional motion such as wheel motor applications or cylinders going over center.

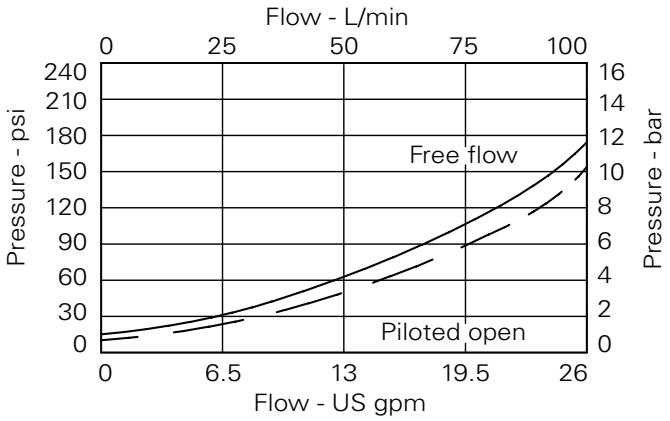
Performance data

Ratings and specifications

Performance data is typical with fluid at 32 cST (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts steel. External surfaces zinc plated.
Standard housing materials	Aluminum up to 210 bar. Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity	A12336 (see Section M)
Torque cartridge into cavity	60 Nm (44 lbs ft)
Weight	1CEB90: .29 kg (.63 lbs) 1CEB95: 1.35 kg (2.97 lbs) 1CEEB95: 2.10 kg (4.62 lbs)
Seal kit	SK634 (Nitrile) SK634V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 ml/min (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE****	–	F	4W	– 35	S	4
1		2	3	4	5	6

1 Function

1CEB90 - Cartridge only

1CEB95 - Cartridge and body

1CEEB95 - Cartridges and dual body

2 Adjustment

F - Screw adjustment

N - Fixed - State pressure setting required.

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

Code	Port Size	Housing number - body only			
Body Only		Aluminium single	Steel single	Aluminium dual	Steel dual
4W	1/2" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B13625	B13626	C13627	C13628
8T	1/2" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10806	B10922	C10807	C11561

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 70-225 bar. Std setting 100 bar

35 - 200-350 bar. Std setting 210 bar

Std setting made at 4.8 L/min

5 Seal material

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

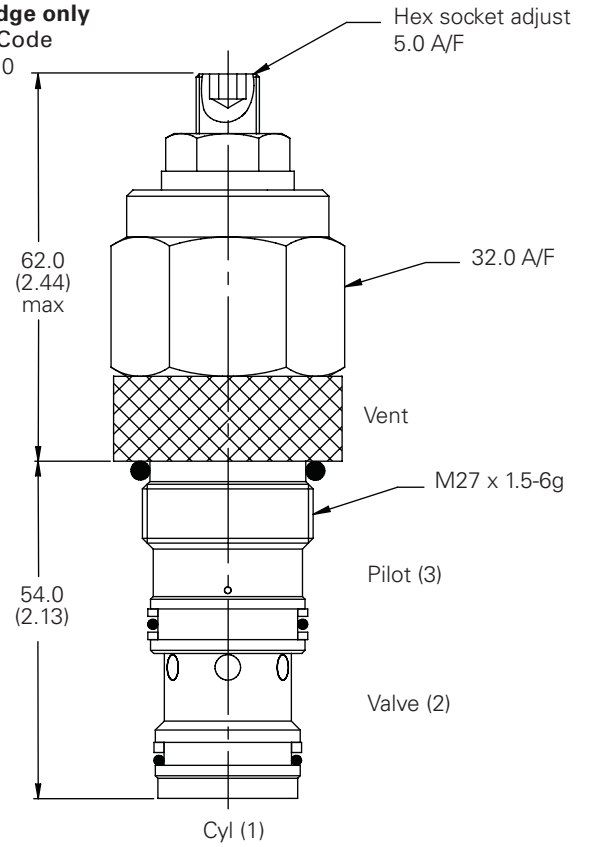
6 Pilot ratio

4 - 4:1 Other ratios available upon request

Dimensions

mm (inch)

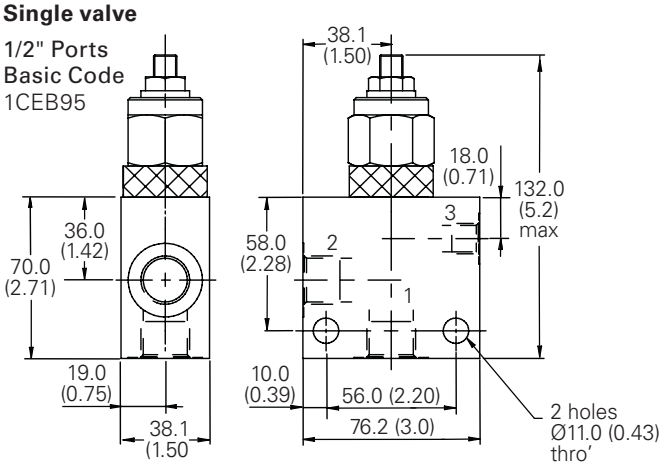
Cartridge only
Basic Code
1CEB90



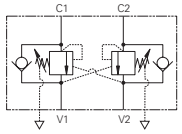
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

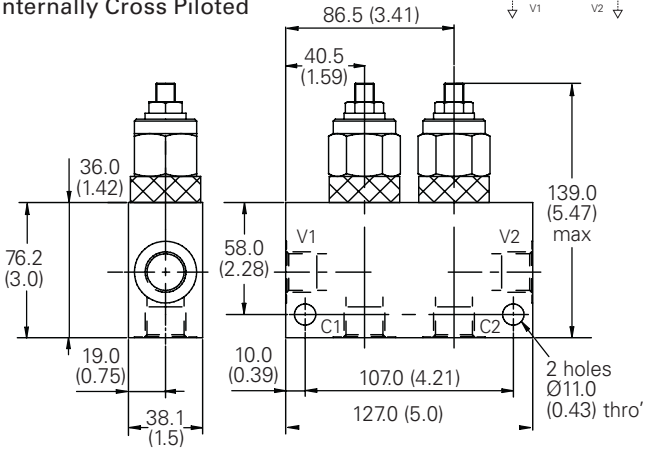
Note: For applications above 210 bar - please consult our technical department or use the steel body option.

Single valve
1/2" Ports
Basic Code
1CEB95



Dual valve
1/2" Ports
Basic Code 1CEEB95
Internally Cross Piloted

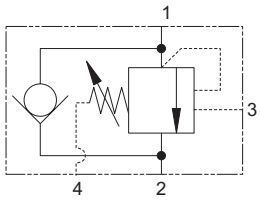




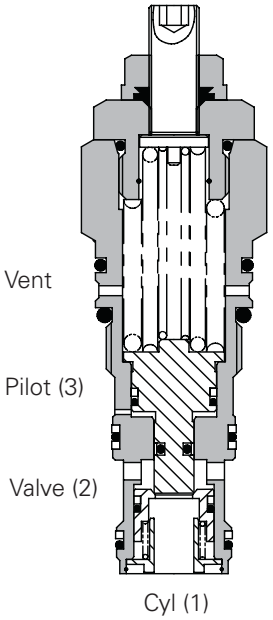
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBD90 - Overcenter valve

Fully balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They will stop runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced overcenter relief setting is unaffected by back pressure, enabling the valve to stay open when the valve port pressure rises. This will allow service line reliefs to work normally and will also allow the control of regenerative or proportional systems. The drain line allows the valve to be used in corrosive atmospheres preventing the ingress of atmospheric contaminant.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

Other ratios available upon request.

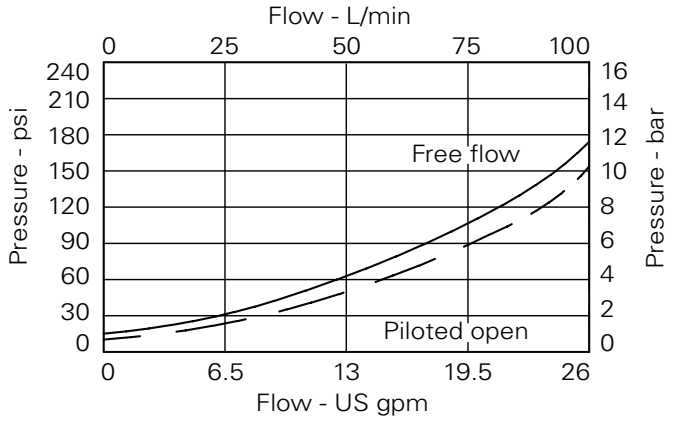
Performance data

Ratings and specifications

Figures based on Oil Temp = 40˚C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Mounting position	Unrestricted
Cavity	A12196 (See section M)
Torque cartridge into cavity	60 Nm (44 lbs ft)
Weight	0.29 kg (0.63 lbs)
Seal kit	SK634 (Nitrile) SK634V (Viton®) SK634P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Fully balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)

Model Code

1CEBD90 – F – ** P 4

1 2 3 4 5

1 Function
1CEBD90

2 Adjustment means
F - Screw adjustment

Line body available on request.

3 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 70-225 bar
Standard setting 100 bar

35 - 200-350 bar
Standard setting 210 bar

Standard setting made at 4.8 L/min

4 Seals

S - Nitrile (for use with most industrial hydraulic oils)

SV - Viton (for high temperature and most special fluid applications)

P - Polyurethane/Nitrile (for arduous applications)

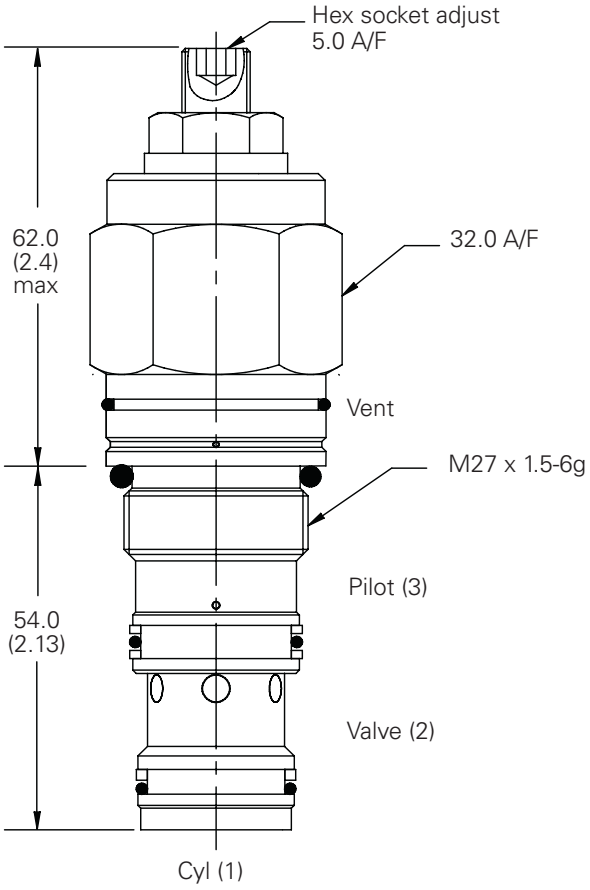
5 Pilot ratio

4 - 4:1 Other ratios available upon request

Dimensions

mm (inch)

Cartridge only
Basic Code
1CEBD90



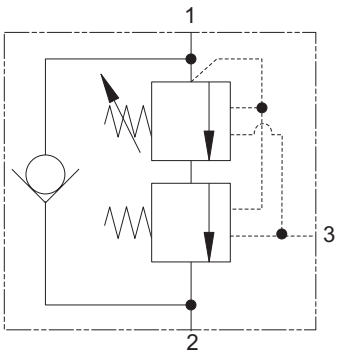
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEL90 - Overcenter valve

Counterbalance, pilot assisted relief with check
90 L/min (23 USgpm) • 280 bar (4000 psi)



Operation

The check section allows free flow and then locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied, maintaining a counterbalance pressure to prevent initial pressure loss and therefore instability. The total pressure setting will normally be set at 1.3 times the load induced pressure. The counterbalance pressure reduces as the pilot pressure increases.

Features

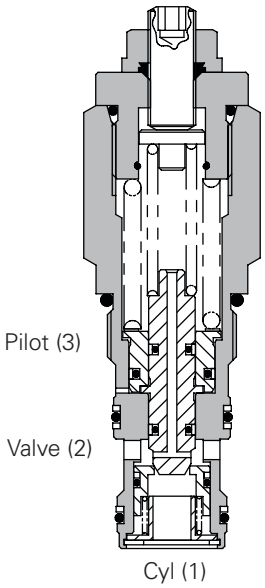
Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

Primary 5.6:1

Secondary 0.7:1

Sectional view



Performance data

Ratings and specifications

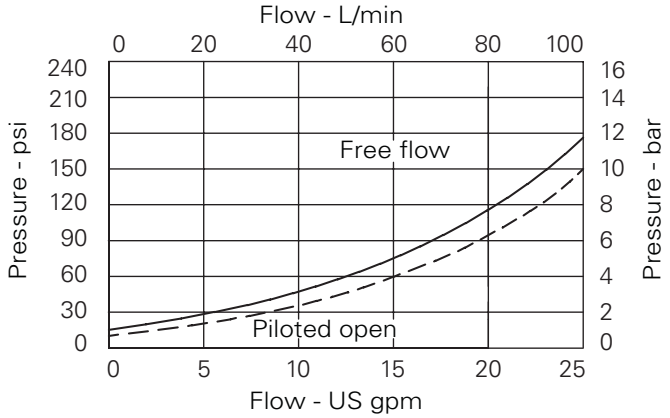
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Maximum setting	1SEL30
Max load induced pressure	280 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A12336 (See Section M)
Torque cartridge into cavity	60 Nm (44 ft. lbs.)
Weight	1CEL90 0.29 kg (0.63 lbs.) 1CEL95 1.35 kg (2.97 lbs.) 1CEEL95 2.10 kg (4.62 lbs.)
Seal kit number	SK633 (Nitrile) SK633V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° C to +90° C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Description

The 1CEL overcenter valve performs all duties of a regular overcenter but maintains a counterbalance pressure to provide dampening of cylinders when there is a rapid loss in stored pressure. This counterbalance pressure reduces as the pilot pressure increases. Typical applications include extension cylinders on telescopic handlers where it is important to have a smooth operation when retracting from full extension.

Pressure drop



Note: This valve has been designed to eliminate instability from flexible boom applications or where the load induced pressure varies greatly. To get the best results, the settings should be adjusted for each application and then factory set for production quantities. Please contact our Technical Department for more information.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE* – F 4W – 30 S 220 / 60**

1 2 3 4 5 6 7

1 Function

1CEL90 - Cartridge Only

1CEL95 - Cartridge and Body

1CEEL95 - Cartridges and Dual Body

2 Adjustment means counterbalance setting

F - Screw Adjustment
N - Fixed - State pressure setting required.

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port sizes

Code	Port Size	Housing Number - Body Only			
		Aluminium single	Steel Single	Aluminium dual	Steel dual
4W	1/2" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B13625	B13626	C13627	C13628
8T	1/2" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10806	B10922	C10807	C11561

4 Pressure range bar @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 170-350 Standard 220 (160/60)

30 - 210-380 Standard 280 (220/60).
Standard setting made at 4.8 L/min

5 Seals

S - Nitrile (for use with most industrial hydraulic coils)

SV - Viton (for high temperature and most special fluid applications)

6 High pressure setting bar

(10 bar increments) 150 to 230 bar (2175 to 3335 psi)

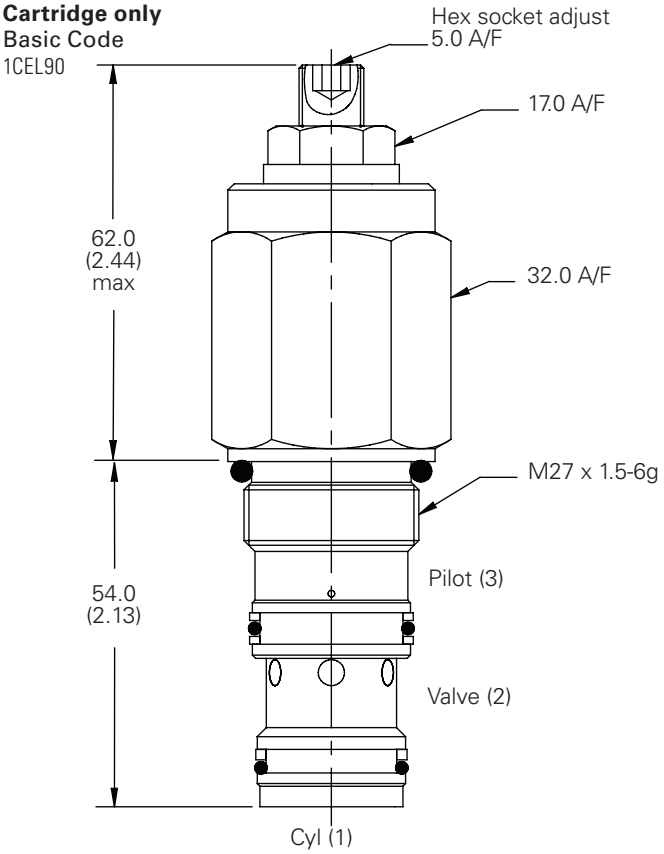
7 Counterbalance setting bar

(10 bar increments)
20 to 170 bar (300 tp 250 psi)

Dimensions

mm (inch)

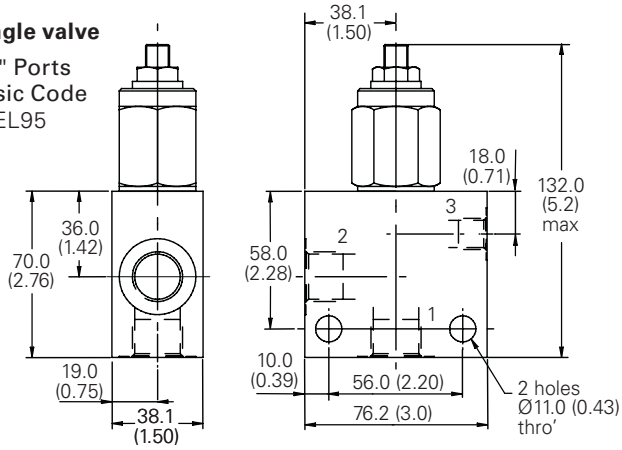
Cartridge only
Basic Code
1CEL90



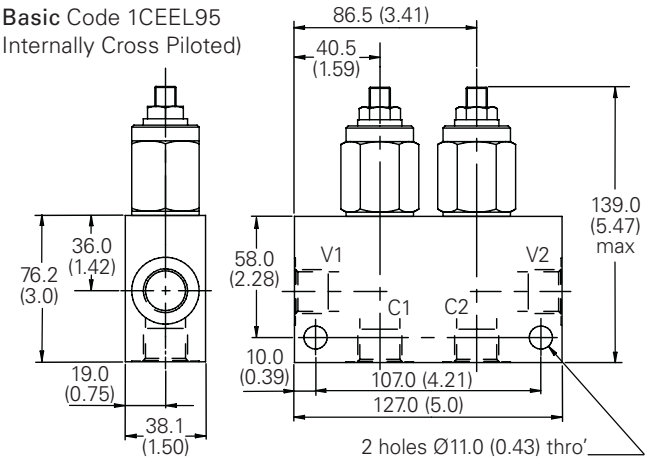
Note: For applications above 210 bar, please consult our technical department or use the steel body option.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Single valve
1/2" Ports
Basic Code
1CEL95



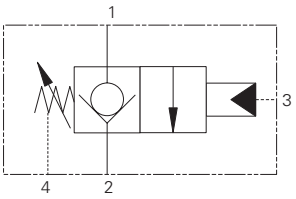
Dual valve
1/2" Ports
Basic Code 1CEEL95
Internally Cross Piloted)



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CPBD90 - Overcenter valve

Zero differential with check
90 L/min (23 USgpm) • 350 bar (5000 psi)



Operation

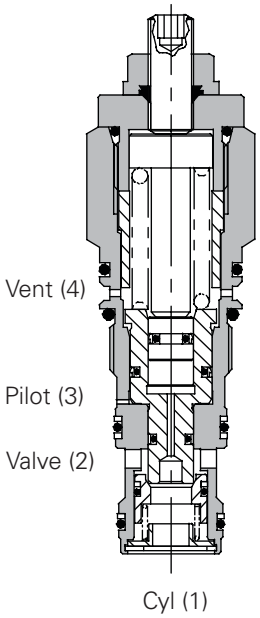
The check section allows free flow into the actuator then holds and locks the load against movement. By the application of pilot pressure to the pilot port the poppet moves back against the main spring opening the cylinder port to the valve port. The metering characteristic of the valve is controlled by the rate of the spring, the seat angle and the pilot pressure applied.

Due to the balanced poppet design load induced pressure will not open the valve and once open valve port pressure will not increase the pilot pressure required to keep the valve open.

Pilot ratios

The cartridge fits a simple cavity allowing quick, easy field service reducing down time. Hardened poppet and seat provide for long leak free performance.

Sectional view



Performance data

Ratings and Specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Maximum working pressure	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A12196 (See Section M)
Torque cartridge into cavity	60 Nm (44 ft. lbs.)
Weight	0.29 kg (0.63 lbs.)
Seal kit number	SK634 (Nitrile) SK634V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Temperature	-30° C to +90° C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Application

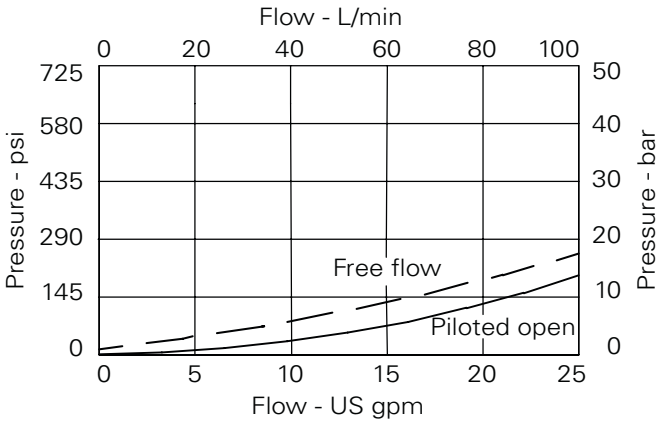
Zero differential overcenter valves give static and dynamic control of loads by supplying a restriction to flow related to the opening of the valve created by the pilot pressure.

The valve is used in conjunction with a remote pilot source to provide hose failure protection, load control and load holding functions.

If over-pressure or shock pressure protection is required then a separate relief valve should be used.

The drain line allows the valve to be used in corrosive atomspheres preventing the ingestion of atomosphere contamination.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CPBD90 – F – 2 P

1 2 3 4

1 Function

1CPBD90 - Cartridge Only

Line body available on request.

2 Adjustment means

F - Screw Adjustment

3 Pilot adjustment range @ 4.8 L/min

Note: Code based on pressure in bar.

2 - 5 - 20 bar.
Standard setting: 10 bar

Standard setting made at 4.8 L/min

4 Seals

S - Nitrile (for use with most industrial hydraulic coils).

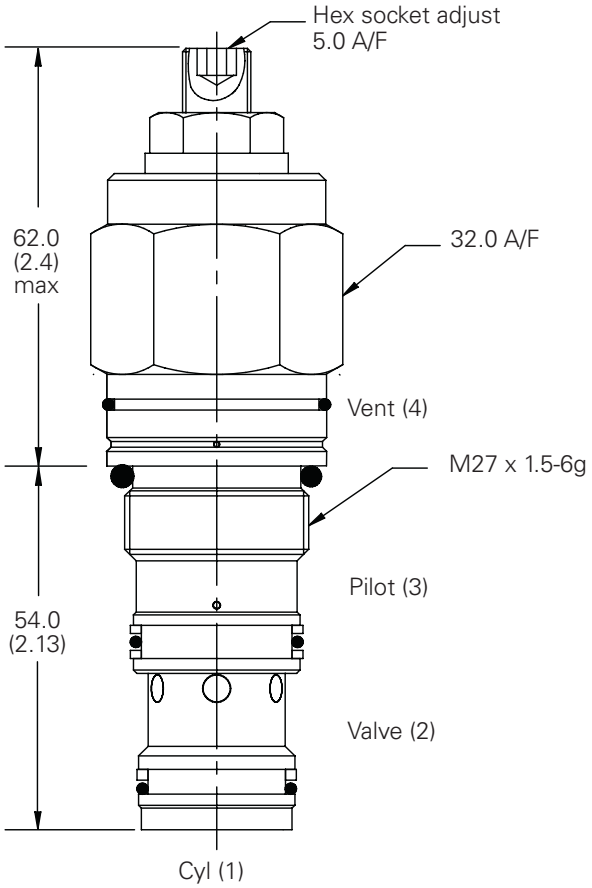
SV - Viton (for high temperature andmost special fluid applications).

P - Polyurethane/Nitrile (for arduous applications)

Dimensions

mm (inch)

Cartridge only
Basic Code
1CPBD90



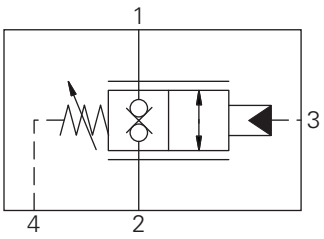
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CPPD90 - Piloted Bi-directional poppet valve

Poppet, pilot operated, normally closed, zero differential
90 L/min (23 USgpm) • 350 bar (5000 psi)



Operation

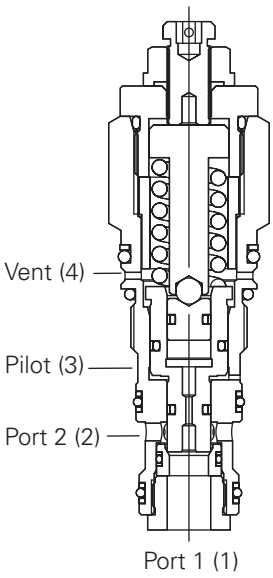
By the application of pilot pressure to the pilot port the poppet moves back against the main spring opening. The metering characteristic of the valve is controlled by the rate of the spring, the seat angle and the pilot pressure applied.

Due to the balanced poppet design load induced pressure will not open the valve and once open valve port pressure will not increase the pilot pressure required to keep the valve open.

Features

The cartridge fits a simple cavity allowing quick, easy field service reducing down time. Hardened poppet and seat provide for long leak free performance.

Sectional view



Performance data

Ratings and Specifications

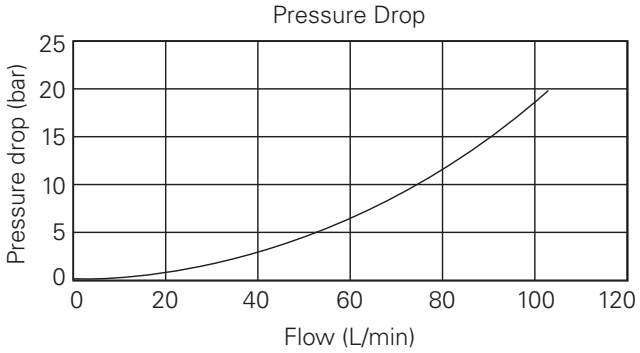
Figures based on: Oil Temp = 40˚C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Maximum working pressure	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel.
Mounting position	External surfaces Nickel/ Zinc plated.
Cavity number	Unrestricted
Torque cartridge into cavity	A12196 (See Section M)
Weight	60 Nm (44 ft. lbs.)
Seal kit number	SK1453 (Nitrile) SK1453V (Viton*) SK1453P (Polyurethane/ Nitrile)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Temperature	-30° C to +90° C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Application

Normally closed pilot operated zero differential bi-directional poppet valve providing flow control by application of pilot pressure to actuate the poppet and increase the flow path

Balanced construction ensures predictable switching regardless of pressure in port 1 or 2. The drain line allows the valve to be used in corrosive atmospheres preventing the ingress of atmospheric contamination.



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CPPD90 - Piloted Bi-directional poppet valve

Poppet, pilot operated, normally close, zero differential
90 L/min (23 USgpm) • 350 bar (5000 psi)

Model code

1CPPD90 – F – 2 P

1 2 3 4

1 Function

1CPPD90 - Cartridge Only

2 Adjustment means

F - Screw Adjustment
G - Tamperproof Cap
N - Fixed - State pressure setting required

3 Pilot adjustment range @ 4.8 L/min

Note: Code based on pressure in bar.

2 - 8 - 25 bar.
Standard setting: 10 bar

Standard setting made at 4.8 L/min

4 Seals

S - Nitrile (for use with most industrial hydraulic coils).

SV - Viton (for high temperature andmost special fluid applications).

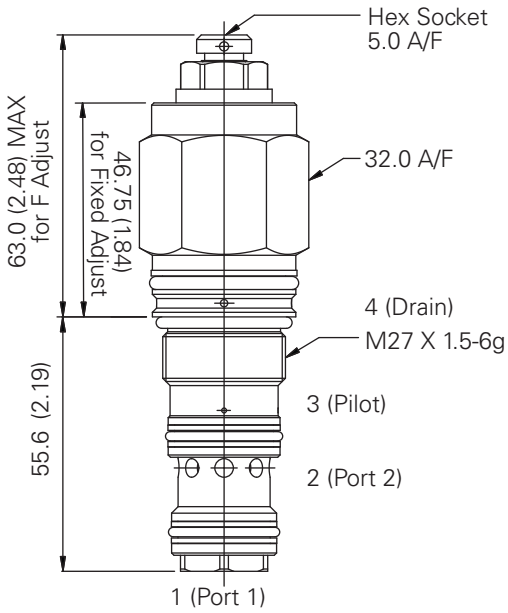
P - Polyurethane/Nitrile (for arduous applications)

Line body available on request.

Dimensions

mm (inch)

Cartridge only
Basic Code
1CPPD90



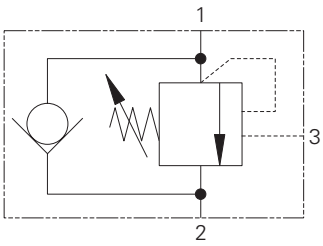
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

F

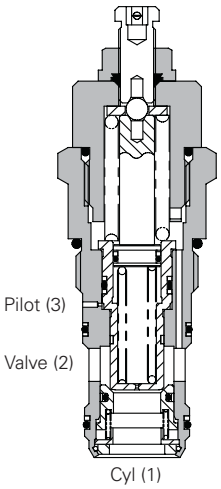
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CE120 - Overcenter valve

Pilot assisted relief with check
120 L/min (32 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

3.5:1 (standard) Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

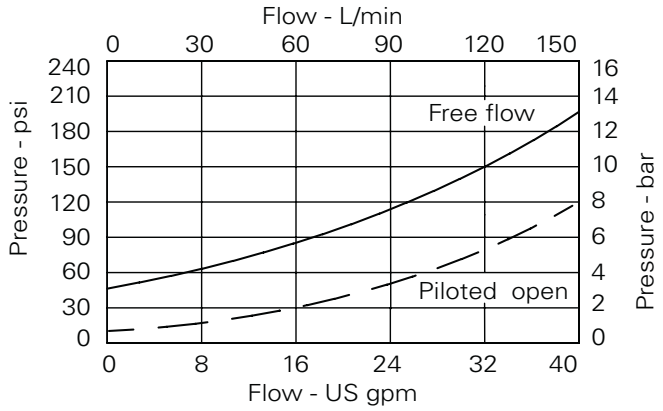
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	120 L/min (32 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A877 (See Section M)
Torque cartridge into cavity	100 Nm (74 lbs ft)
Weight	1CE120 0.59 kg (1.30 lbs) 1CE150 1.46 kg (3.20 lbs 1CEE150 2.58 kg (5.70 lbs)
Seal kit number	SK417 (Nitrile) SK417V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30°C to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE**** – F 6W – 35 S 3

1 2 3 4 5 6

1 Function

1CE120 - Cartridge Only
1CE150 - Cartridge and Body
1CEE150 - Cartridges and Dual Body

2 Adjustment means

F - Screw Adjustment

3 Port sizes

Code	Port size	Housing number			
		Aluminium single	Steel single	Aluminium dual	Steel dual
6W	3/4" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B6898	B5544	C2543	C1200
12T	3/4" SAE Valve & Cyl Port. 1/4" SAE Pilot Port	B8200		C10629	C16434
16T	1" SAE Valve & Cyl Port. 1/4" SAE Pilot Port	B10708	B11814		

4 Pressure range @ 4.8 l/min

Note: Code based on pressure in bar.

35 - 70-350 bar.
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot Ratio

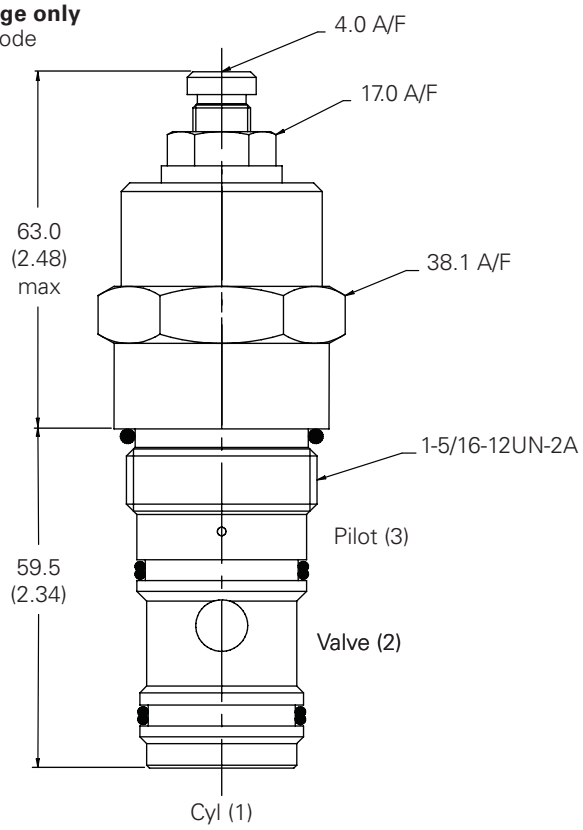
3 - 3.5:1

8 - 8:1

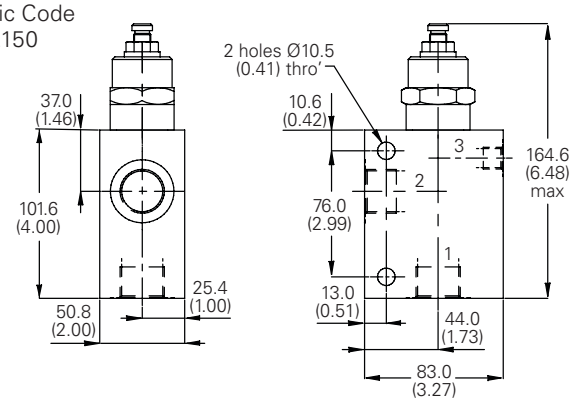
Dimensions

mm (inch)

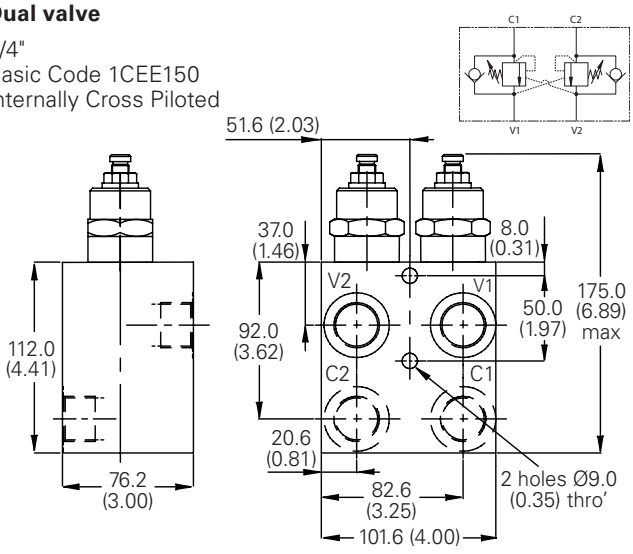
Cartridge only
Basic Code
ICE120



Single valve
3/4" , 1" Ports
Basic Code
1CE150



Dual valve
3/4"
Basic Code 1CEE150
Internally Cross Piloted



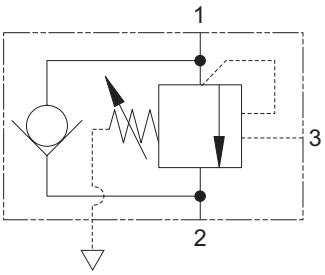
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Note: For applications above 210 bar - please consult our technical department or use the steel body option.

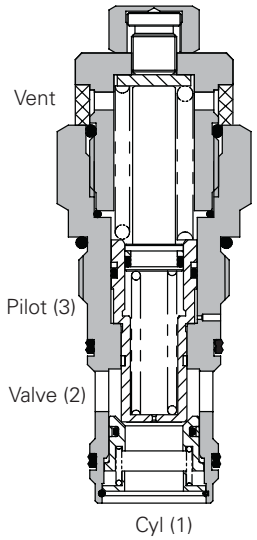
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEB120 - Overcenter valve

Fully balanced, pilot assisted relief with check
120 L/min (32 USgpm). 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They prevent runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced valve is unaffected by back pressure, allowing service line reliefs to operate and for the valve to be used in regenerative or proportional valve systems.

The overcenter valve should be mounted either into, onto or as close to the actuator as possible to give maximum protection.

Single overcenter valves control unidirectional loads such as in aerial platforms, cranes or winches and dual overcenters are suited to bi-directional motion such as wheel motor applications or cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

3:1 (standard) Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

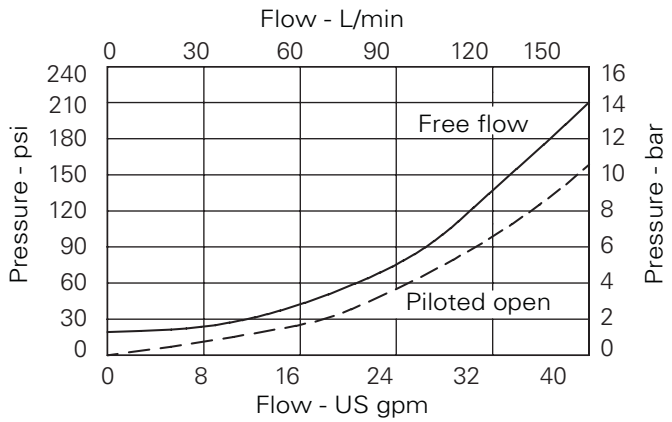
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	120 L/min (32 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A877 (See Section M)
Torque cartridge into cavity	100 Nm (74 lbs ft)
Weight	1CEB120 0.59 kg (1.30 lbs) 1CEB150 1.46 kg (3.20 lbs) 1CEEB150 2.58 kg (5.70 lbs)
Seal kit number	SK417 (Nitrile) SK417V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEB120 - Overcenter valve

Fully balanced, pilot assisted relief with check
120 L/min (32 USgpm). 270 bar (4000 psi)

Model code

1CE*** – P 6W – 35 S 3**

1 2 3 4 5 6

1 Function

1CEB120 - Cartridge only

1CEB150 -Cartridge in body

1CEEB150 - Cartridges in dual body

2 Adjustment means

P - Leakproof screw adjustment

3 Port sizes

Code	Port Size	Housing number - body only			
		Aluminium single	Steel single	Aluminium dual	Steel dual
6W	3/4" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B6898	B5544	C2543	C1200
12T	3/4" SAE Valve & Cyl Port. 1/4" SAE Pilot Port	B8200		C10629	C16434
16T	1" SAE Valve & Cyl Port. 1/4" SAE Pilot Port	B10708	B11814		

4 Pressure range @ 4.8 l/min

Note: Code based on pressure in bar.

35 - 70-350 bar.
Std setting 210 bar
Std setting made at 4.8 L/min

5 Seals

S -Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

P - Polyurethane/Nitrile (For arduous applications)

6 Pilot ratio

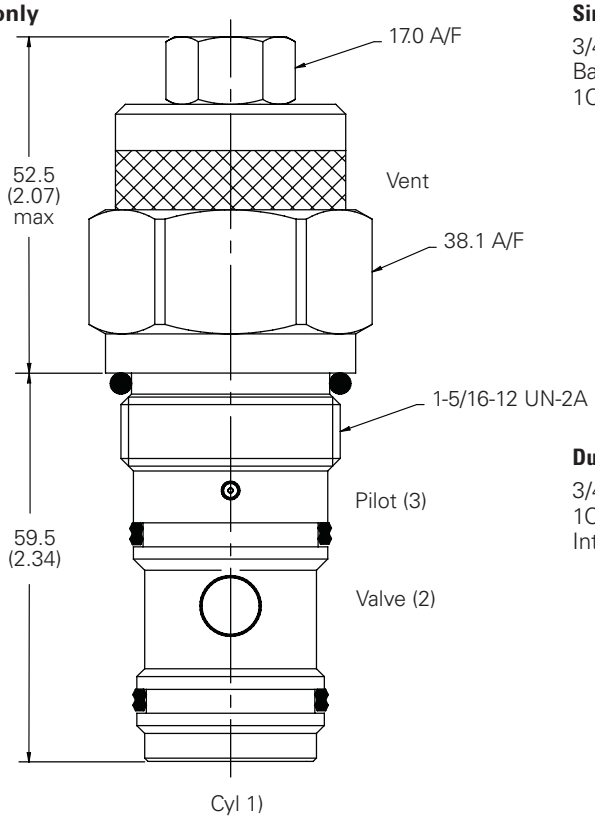
3 - 3:1 (Standard)

8 - 8:1

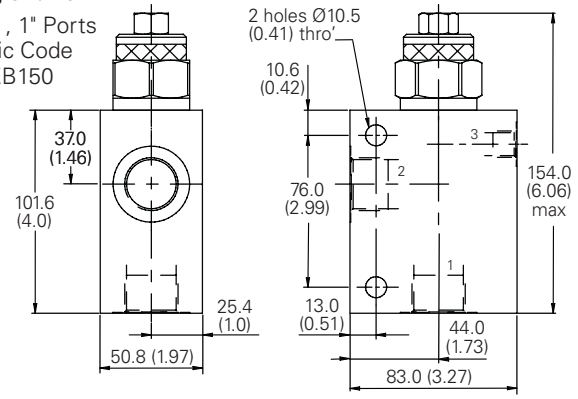
Dimensions

mm (inch)

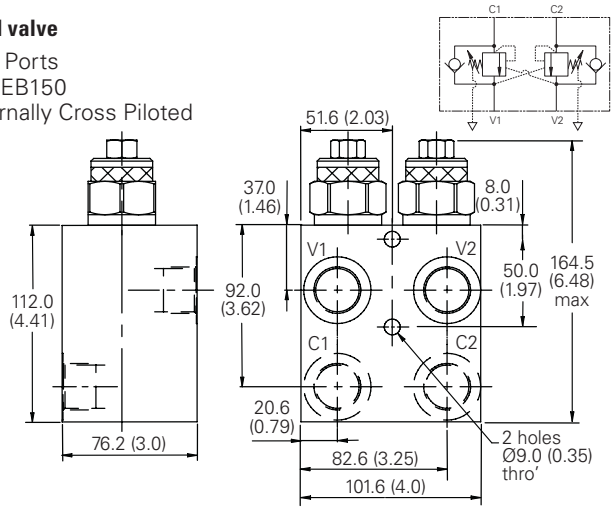
Cartridge only
Basic Code
ICEB120



Single valve
3/4" , 1" Ports
Basic Code
1CEB150



Dual valve
3/4" Ports
1CEEB150
Internally Cross Piloted



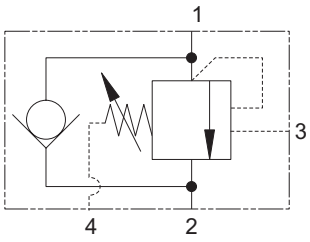
Note: For applications above 210 bar - please consult our technical department or use the steel body option

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

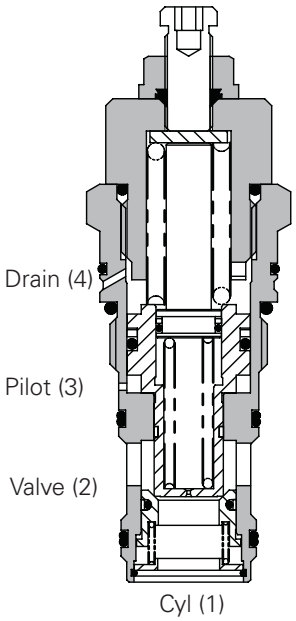
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBD120 - Overcenter valve

Fully balanced, pilot assisted relief with check
180 L/min (47 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They will stop runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced overcenter relief setting is unaffected by back pressure, enabling the valve to stay open when the valve port pressure rises. This will allow service line reliefs to work normally and will also allow the control of regenerative or proportional systems. The drain line allows the valve to be used in corrosive atmospheres preventing the ingress of atmospheric contaminant.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time.

Pilot ratio

3:1 (standard) Best suited for applications where load varies and machine structure can induce instability.

8:1 & 12:1 Best suited for applications where the load remains relatively constant.

22:1 Specifically designed for Boom Loc applications.

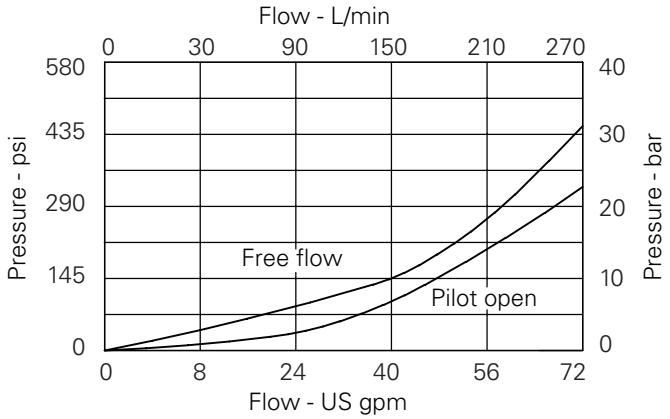
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	180 L/min (47 USgpm)
Max relief setting	400 bar (5800 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Mounting position	Unrestricted
Cavity number	A6726 (See Section M)
Torque cartridge into cavity	100 Nm (74 lbs ft)
Weight	0.59 kg (1.30 lbs)
Seal kit number	SK830 (Nitrile) SK830V (Viton®) SK830P (Polyurethane/Nitrile)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30°C to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min max (5 dpm)
Nominal viscosity range	5 to 500 cSt
Bar per turn	65 bar

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CEBD120 – F – 35 P 8

1 2 3 4 5

1 Function
1CEBD120 - Cartridge only

2 Adjustment means
F - Screw adjustment

3 Pressure range @ 4.8 l/min
Note: Code based on pressure in bar.

35 - (3:1, 8:1 and 22:1): 70-350 bar
Std setting 350 bar

40 - (12:1): 70-400 bar.
Std setting 350 bar
Std setting made at 4.8 L/min

4 Seals
S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

P - Polyurethane/Nitrile (For arduous applications)

5 Pilot ratio
3 - 3:1

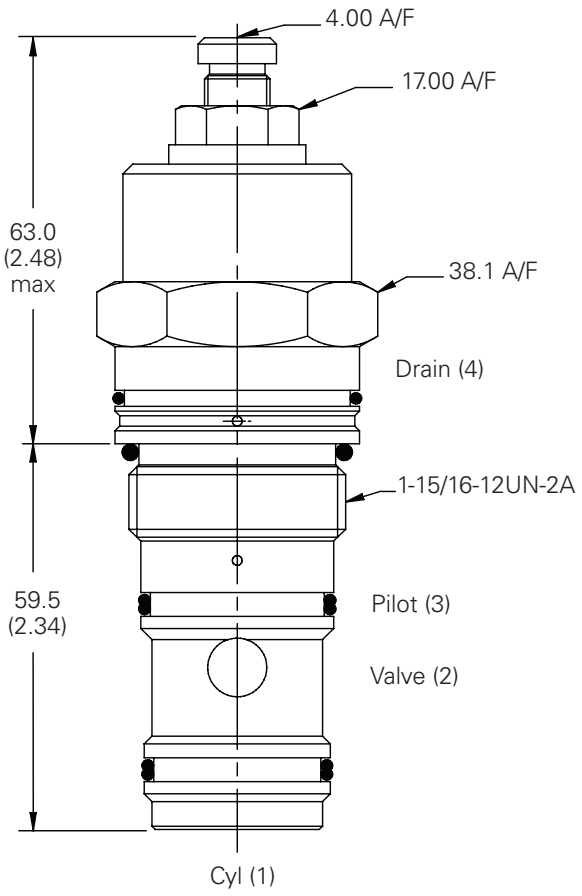
8 - 8:1

12 - 12:1

22 - 22:1

Dimensions
mm (inch)

Cartridge only
Basic Code
1CEBD120



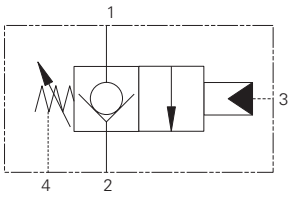
Note: For applications above 210 bar - please consult our technical department or use the steel body option

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

F

1CPBD120 - Overcenter valve

Zero differential with check
180 L/min (47 USgpm) • 400 bar (5800 psi)



Operation

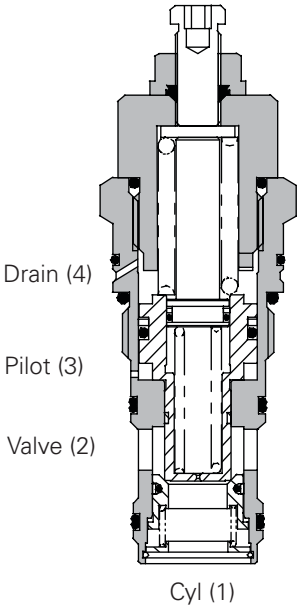
The check section allows free flow into the actuator then holds and locks the load against movement. By the application of pilot pressure to the pilot port the poppet moves back against the main spring opening the cylinder port to the valve port. The metering characteristic of the valve is controlled by the rate of the spring, the seat angle and the pilot pressure applied.

Due to the balanced poppet design load induced pressure will not open the valve and once open valve port pressure will not increase the pilot pressure required to keep the valve open.

Features

The cartridge fits a simple cavity allowing quick, easy field service reducing down time. Hardened poppet and seat provide for long leak free performance.

Sectional view



Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	180 L/min (47 USgpm)
Max working pressure	400 bar (5800 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A6726 (See Section M)
Torque cartridge into cavity	100 Nm (74 lbs ft)
Weight	0.59 kg (1.30 lbs)
Seal kit number	SK830 (Nitrile) SK830V (Viton®) SK830P (Polyurethane/Nitrile)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min max (5 dpm)
Nominal viscosity range	5 to 500 cSt
Bar per turn	5 bar

Viton® is a registered trademark of E.I. DuPont

Description

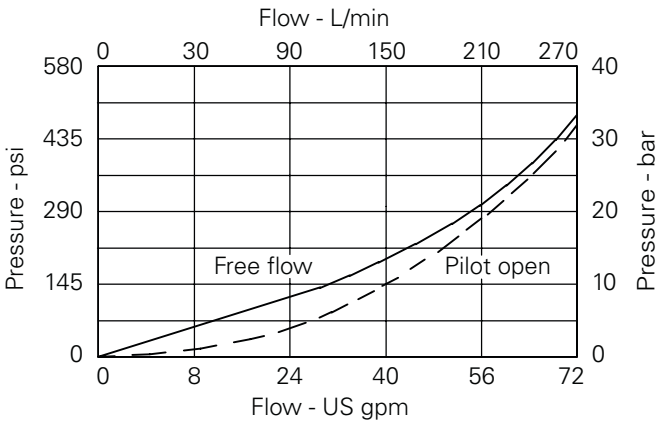
Zero differential overcenter valves give static and dynamic control of loads by supplying a restriction to flow related to the opening of the valve created by the pilot pressure.

The valve is used in conjunction with a remote pilot source to provide hose failure protection, load control and load holding functions.

If over-pressure or shock pressure protection is required then a separate relief valve should be used.

The drain line allows the valve to be used in corrosive atmospheres preventing the ingress of atmospheric contaminant.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CPBD120 – F – 2 P

1 2 3 4

1 Function
1CPBD120 - Cartridge only

2 Adjustment means
F - Screw adjustment

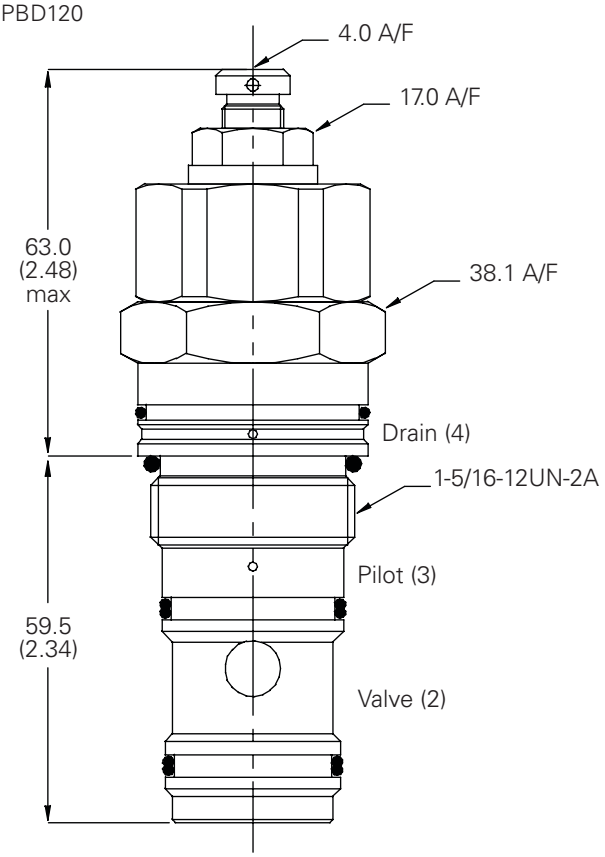
3 Pilot adjust range
Note: Code based on pressure in bar.
2 - 5-20 bar.
Std setting 10 bar
Std setting made at 4.8 L/min

4 Seals
S - Nitrile (For use with most industrial hydraulic oils)
SV - Viton (For high temperature and most special fluid applications)
P - Polyurethane/Nitrile (For arduous applications)

Dimensions

mm (inch)

Cartridge only
Basic Code
1CPBD120



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CE - Overcenter valve

Alternative body arrangements
for 100 Liters/min valves

Model code

1C** – F 6W – 35 S 3**

1 2 3 4 5 6

1 Function

1CE156/1CEB156 - Cartridge & Body Through Ported

1CBE150/1CBEB150 - Cartridge & Body Banjo Mounted

1CEG150/1CEBG150 - Cartridge & Body Gasket Mounted

2 Adjustment means

P - Leakproof Screw Adjust (1CEB156/1CBEB150/ 1CEBG150)

F - Screw Adjust (1CE156/1CBE150/ 1CEG150

3 Port sizes

Code	Port size	Housing number - body only	
		Aluminum	Steel
1CE156/1CE156 Complete Valve Body ONLY part numbers			
6W	3/4" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B13629	B13630
1CBE150/1CBEB150 Sub-assembly part numbers			
6W	3/4" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	AXP13565-6W-S	
1CEG150/1CEBG150 Gasket Mounted numbers			
6W	3/4" SAE 6000 PSI Flange Ports	BXP13634-6W-S	BXP13634-6W-S-377

4 Pressure range @ 4.8 l/min

Note: Code based on pressure in bar.

35 - 70-350 bar. Std setting 210 bar Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

P - Polyurethane/Nitrile (For arduous applications)

6 Pilot ratio

3 - 3.5:1 - 1CE156/1CBE150/ 1CEG150

3 - 3:1 - 1CEB156/1CBEB150/ 1CEBG150 (Standard)

8 - 8:1 - 1CEB156/1CBEB150/ 1CEBG150

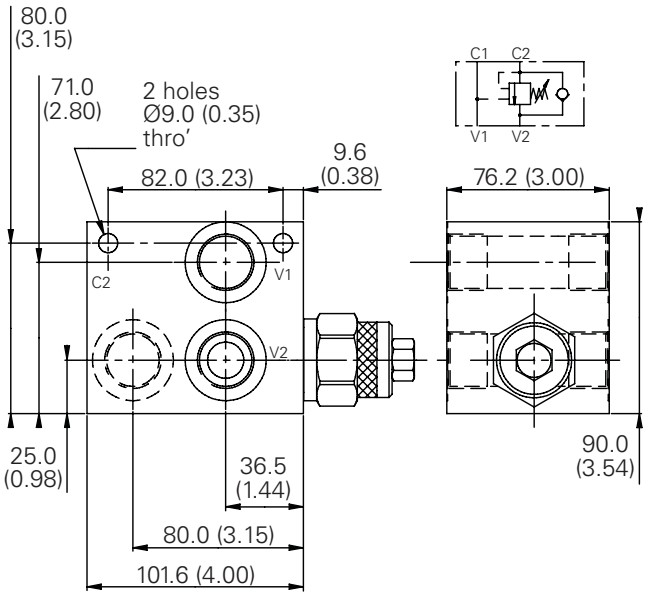
F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

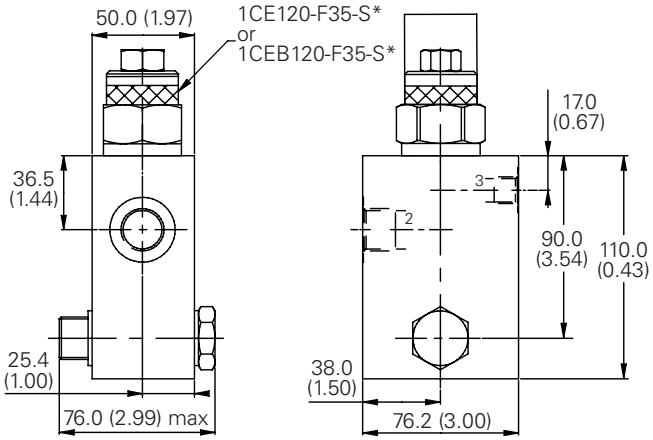
mm (inch)

Complete valve
Through Ported
3/4" Ports
Basic Code
1CE156/1CEB156

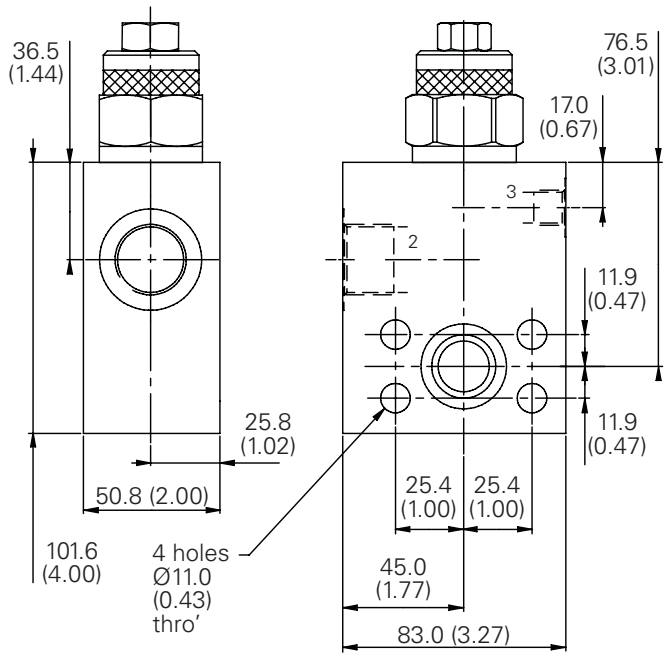


Complete valve
3/4" Ports

Banjo Mounted
Basic Code
1CBE150/1CBEB150



Complete valve
3/4" Ports SAE 6000 PSI Flange Ports
1CEG150/1CEBG150
Gasket Mounted



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

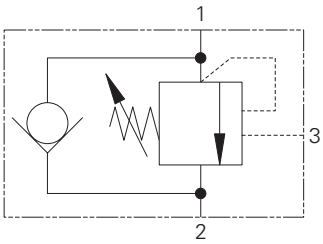
Note: For applications above 210 please consult our Technical Department or use the steel body option.

F

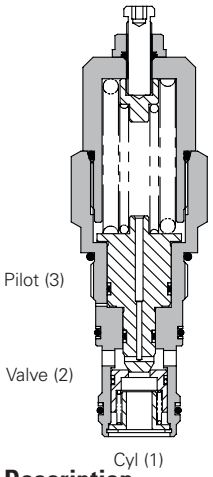
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CE140 - Overcenter valve

Pilot assisted relief with check
140 L/min (37 USgpm) • 340 bar (4930 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

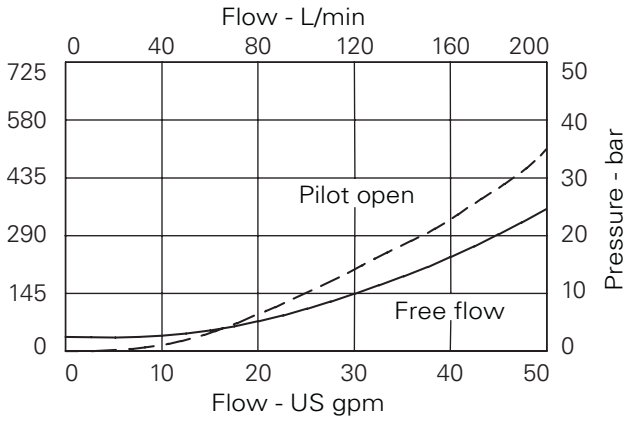
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	140 L/min (37 USgpm)
Max relief setting	420 bar (6090 psi)
Max load induced pressure	340 bar (4930 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A20081
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight	1CE140 1.2 kg (2.5 lbs) 1CE145 (aluminium) 2.2 kg (4.5 lbs) 1CE145 (steel) 4.0 kg (8.8 lbs) 1CEE145 (aluminium) 2.9 kg (6.4 lbs) 1CEE145 (steel) 6.0 kg (13.2 lbs)
Seal kit number	SK1108 (Nitrile) SK1108V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30°C to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

6:1 Best suited for applications where the load remains relatively constant.

Other options available upon request.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE**** **– F 6W – 40 S 4**

1 2 3 4 5 6

1 Function

1CE140 - Cartridge only

1CE145 - Cartridge and body

1CEE145 - Cartridges and body

2 Adjustment means

F - Screw adjustment

3 Port sizes

Code	Port size	Housing number - body only			
		Aluminium single	Steel single	Aluminium dual	Steel dual
6W	3/4" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B20105	B20106		
8W	1" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B20107	B20108	C20285	C20287
16T	1" SAE Valve & Cyl Port. 1/4" SAE Pilot Port	B11946	B11947	C30105	C30106

4 Pressure range @ 4.8 l/min

Note: Code based on pressure in bar.

20 - 140-250 bar.
Std setting 190 bar

30 - 220-330 bar.
Std setting 270 bar

40 - 310-420 bar.
Std setting 370 bar
Std setting made at 4.8 liter/min

5 Seals

S- Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot ratio

4 - 4:1

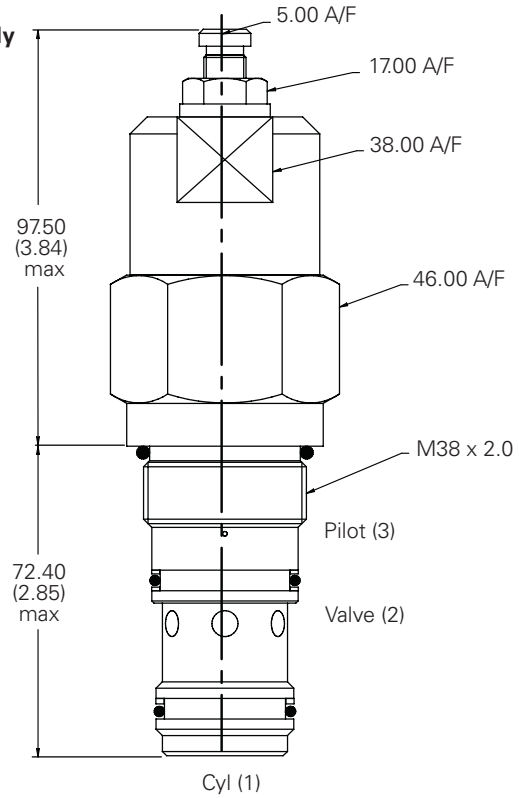
6 - 6:1

Other ratios available upon request

Dimensions

mm (inch)

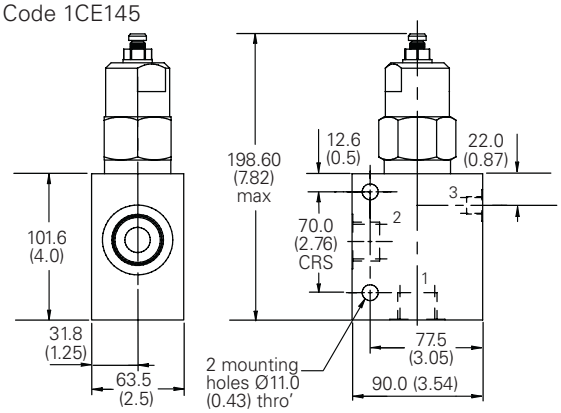
Cartridge only
Basic Code
1CE140



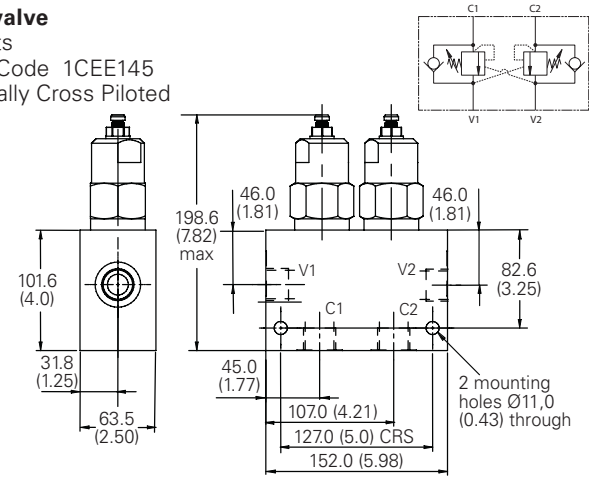
Note: For applications above 210 bar - please consult our technical department or use the steel body option

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Single valve
3/4" , 1" Ports
Basic Code 1CE145



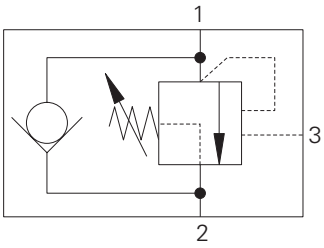
Dual valve
1" Ports
Basic Code 1CEE145
Internally Cross Piloted



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CER140 - Overcenter valve

Part balanced, pilot assisted relief with check
140 L/min (37 USgpm) • 340 bar (4930 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

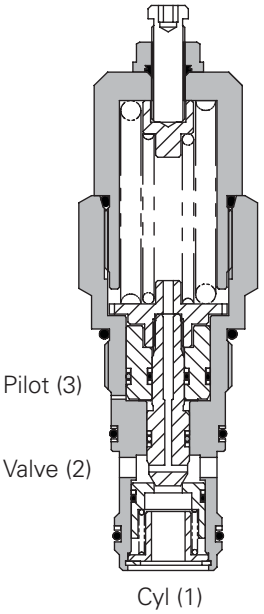
Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

6:1 Best suited for applications where the load remains relatively constant.

Sectional view



Description

The 1CER series overcenter valve performs all duties of a regular overcenter but is able to relieve and stay open irrespective of downstream pressure. This enables the valve to operate when used with a closed center directional valve which has service line reliefs. The poppet is pressure balanced, preventing relief setting increase due to back pressure.

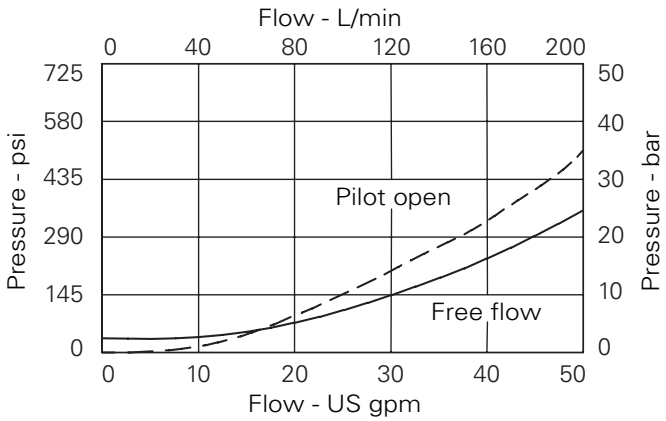
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	140 L/min (37 USgpm)
Max relief setting	420 bar (6090 psi)
Max load induced pressure	340 bar (4930 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A20081
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight	1CER140 1.2 kg (2.6 lbs) 1CER145 (aluminium) 2.2 kg (4.8 lbs) 1CER145 (steel) 4.0 kg (8.8 lbs) 1CEER145 (aluminium) 2.9 kg (6.4 lbs) 1CEER145 (steel) 6.0 kg (13.2 lbs)
Seal kit number	SK1108 Nitrile) SK1108V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Part balanced, pilot assisted relief with check
140 L/min (37 USgpm) • 340 bar (4930 psi)

Model code

1CER* – F 6W – 40 S 4**

1 2 3 4 5 6

1 Function

1CER140 - Cartridge Only

1CER145 - Cartridge and Body

1CEER145 - Cartridges and Body

2 Adjustment means

F - Screw Adjustment

3 Port sizes

Code	Port size	Housing number - body only			
		Aluminium single	Steel single	Aluminium dual	Steel Dual
6W	3/4" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B20105	B20106		
8W	1" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B20107	B20108	C20285	C20287
12T	3/4" SAE Valve & Cyl Port. 1/4" SAE Pilot Port	B11952	B11953		
16T	1" SAE Valve & Cyl Port. 1/4" SAE Pilot Port	B11946	B11947	C30105	C30106

4 Pressure range @ 4.8 l/min

Note: Code based on pressure in bar.

20 - 140-250 bar.
Std setting 190 bar

30 - 220-330 bar.
Std setting 270 bar

40 - 310-420 bar.
Std setting 370 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot ratio

4 - 4:1

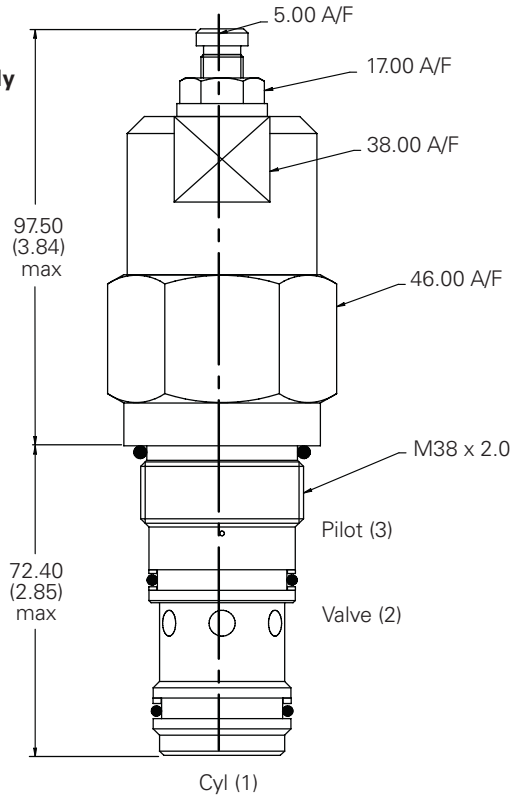
6 - 6:1

Other ratios available upon request

Dimensions

mm (inch)

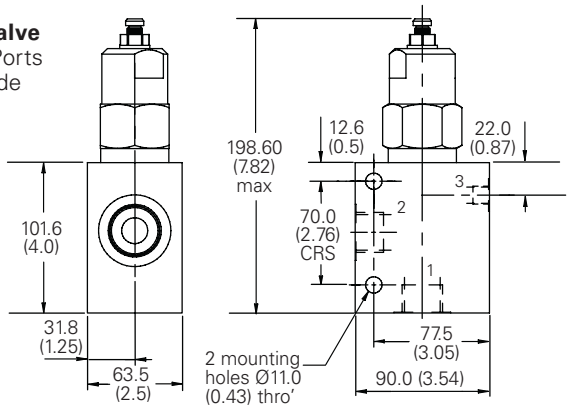
Cartridge only
Basic Code
1CER140



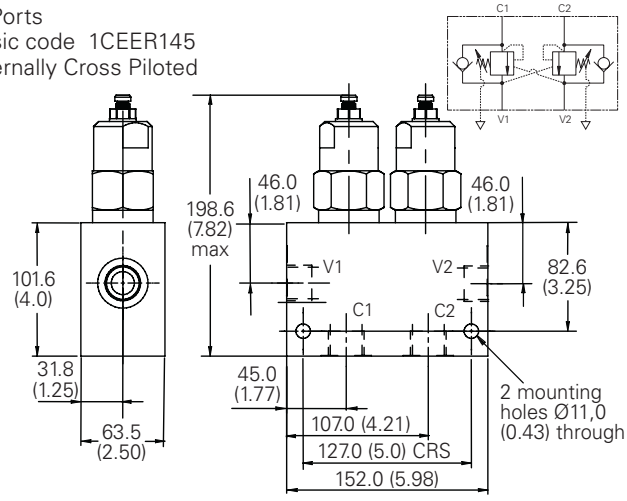
Note: For applications above 210 bar - please consult our technical department or use the steel body option

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Single valve
3/4" , 1" Ports
Basic Code
1CER145



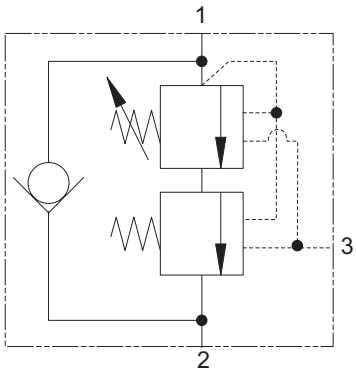
Dual valve
1" Ports
Basic code 1CEER145
Internally Cross Piloted



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEL140 - Overcenter valve

Counterbalance, pilot assisted relief with check
140 L/min (37 USgpm) • 380 bar (5510 psi)



Operation

The check section allows free flow and then locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied, maintaining a counterbalance pressure to prevent initial pressure loss and therefore instability. The total pressure setting will normally be set at 1.3 times the load induced pressure. The counterbalance pressure reduces as the pilot pressure increases.

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

Primary 6.1:1

Secondary 0.5:1

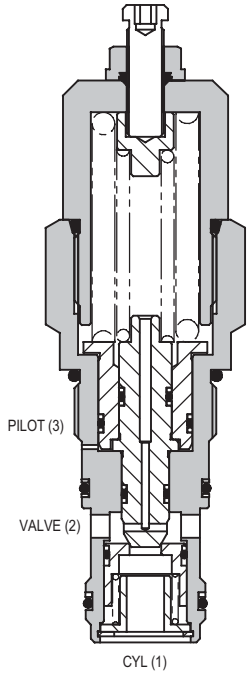
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	140 L/min (37 USgpm)
Max setting	380 bar (5510 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminum (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity number	A20081
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight	1CEL140 1.2 kg (2.6 lbs) 1CEL145 (aluminium) 2.2 kg (4.8 lbs) 1CEL145 (steel) 4.0 kg (8.8 lbs) 1CEEL145 (aluminium) 2.9 kg (6.4 lbs) 1CEEL145 (steel) 6.0 kg (13.2 lbs)
Seal kit number	SK1108 (Nitrile) SK1108V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

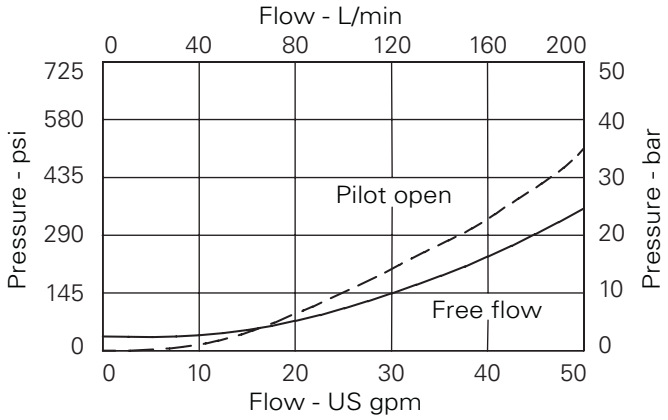
Sectional view



Description

The 1CEL overcenter valve performs all duties of a regular overcenter but maintains a counterbalance pressure to provide dampening of cylinders when there is a rapid loss in stored pressure. This counterbalance pressure reduces as the pilot pressure increases. Typical applications include extension cylinders on telescopic handlers where it is important to have a smooth operation when retracting from full extension.

Pressure drop



Note: This valve has been designed to eliminate instability from flexible boom applications or where the load induced pressure varies greatly. To get the best results, the settings should be adjusted for each application and then factory set for production quantities. Please contact Eaton/ Integrated Hydraulics for more information.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CEL* – F 6W – 30 S 220 / 60**

1 2 3 4 5 6 7

1 Function

1CEL140 - Cartridge Only

1CEL145 - Cartridge and Body

1CEEL145 - Cartridges and Body

2 Adjustment means counterbalance setting

F - Screw Adjustment

3 Port sizes

Code	Port size	Housing number - body only			
		Aluminium single	Steel single	Aluminium dual	Steel dual
6W	3/4" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B20105	B20106		
8W	1" BSP Valve & Cyl Port. 1/4" BSP Pilot Port	B20107	B20108	C20285	C20287
16T	1" SAE Valve & Cyl Port. 1/4" SAE Pilot Port	B11946	B11947	C30105	C30106

4 Pressure Range @ 4.8 l/min

Note: Code based on pressure in bar.

20 - 170-320. Std 220 (160/60)

30 - 230-380. Std 280 (220/60)

40 - 310-380. Std 350 (290/60)

5 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 High pressure setting bar

(10 bar increments).
150 to 350 bar
(2175 to 5000 psi)

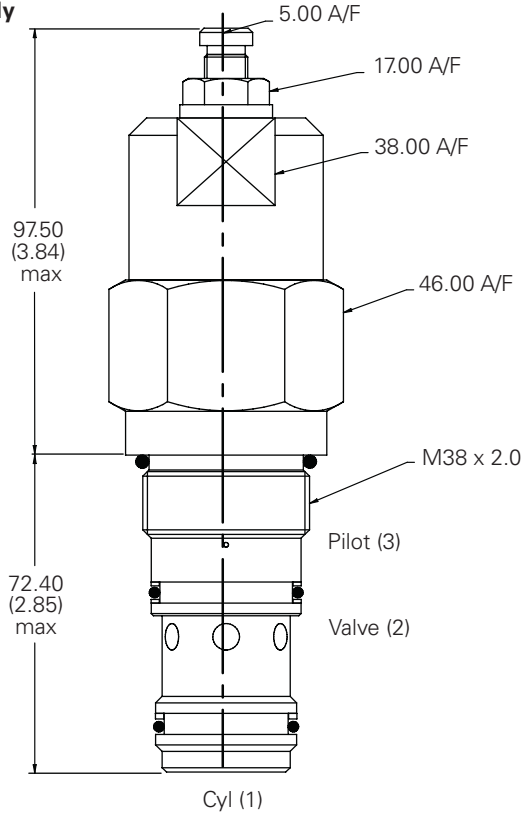
7 Counterbalance setting bar

(10 bar increments).
20 to 100 bar (300 to 1500 psi)

Dimensions

mm (inch)

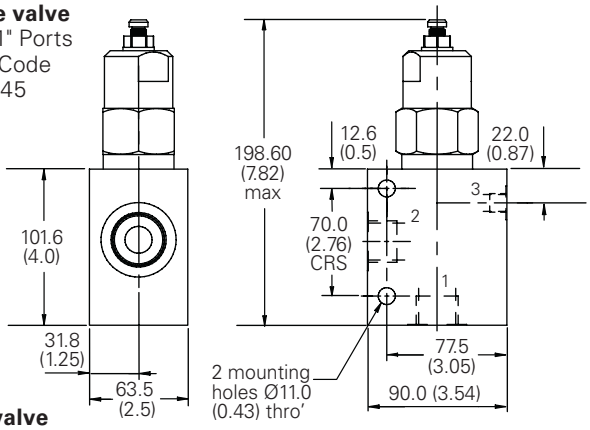
Cartridge only
Basic Code
1CEL140



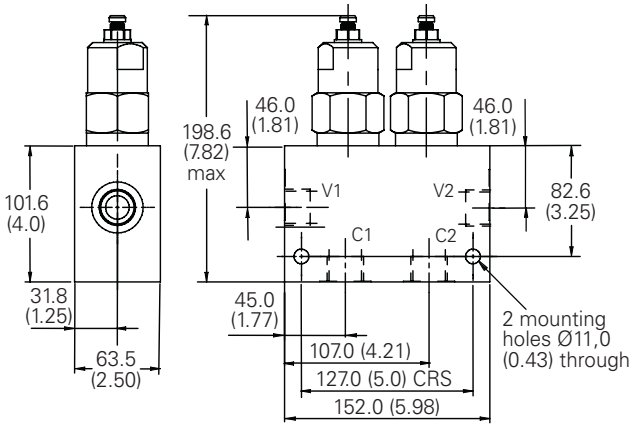
Note: For applications above 210 bar - please consult our technical department or use the steel body option.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Single valve
3/4" , 1" Ports
Basic Code
1CEL145



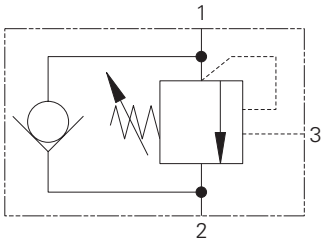
Dual valve
1" Ports
Basic code 1CEEL145
Internally Cross Piloted



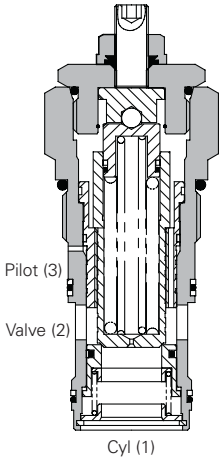
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CE300 - Overcenter valve

Pilot assisted relief with check
300 L/min (80 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

3:1 Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

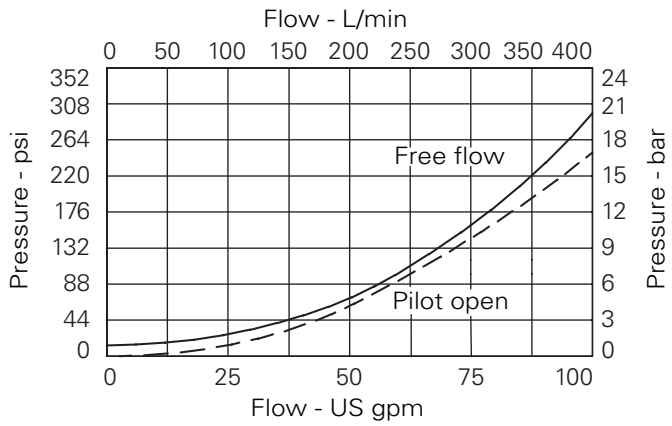
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	300 L/min (80 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Alumiium (up to 210 bar). Add suffix "377" for steel option.
Mounting position	Unrestricted
Cavity	A6935 (See Section M)
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight cartridge only	1CE300 0.91 kg (2.00 lbs) 1CE350 2.71 kg (5.96 lbs) 1CEE350 5.42 kg (11.92 lbs)
Seal kit	SK437 (Nitrile) SK437V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30°C to +90°C (-22° to +194°F)
Internal leakage	4 milliliters/min nominal (60 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE** – F 10W – 35 S 3**

1 2 3 4 5 6

1 Function

1CE300 - Cartridge only

1CE350 - Cartridge and Body

1CEE350 - Cartridges and Body

2 Adjustment

F - Screw adjustment

3 Port size

Code	Port size	Housing number - body only			
		Aluminium single	Steel single	Aluminium dual	Steel dual
10W	1 1/4" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B6814	B8610	C8704	C8705
20T	1 1/4" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10630	B11474	C10811	C11564

4 Pressure range

Note: Code based on pressure in bar.

35 - 70-350 bar.

Std setting 210 bar

Std setting made at 4.8 L/min

5 Seal material

S - Buna-N

SV - Viton

6 Pilot ratio

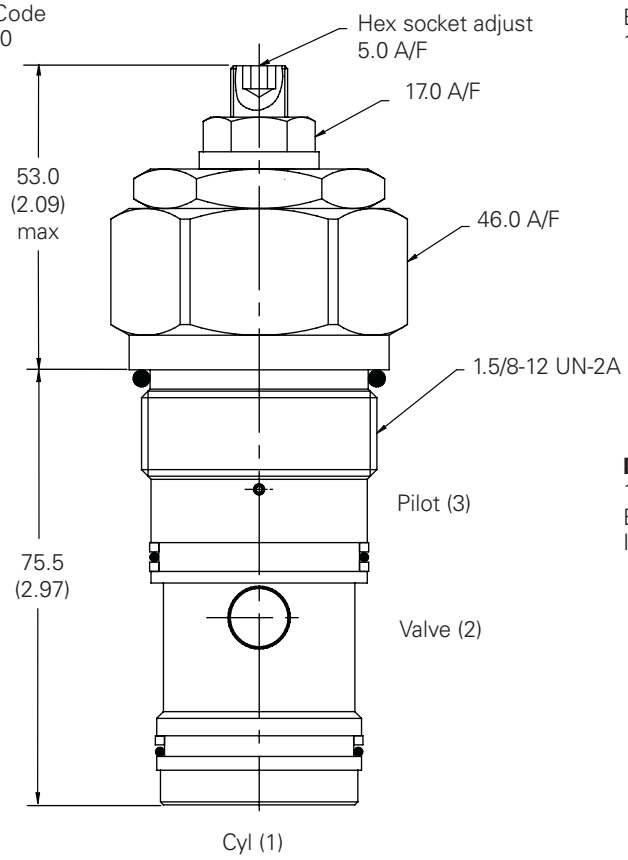
3 - 3:1 - (Standard)

8 - 8:1

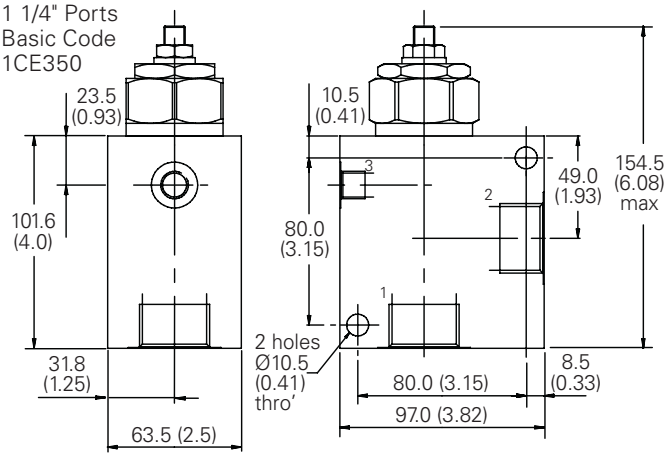
Dimensions

mm (inch)

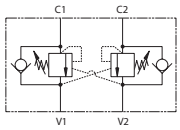
Cartridge only
Basic Code
1CE300

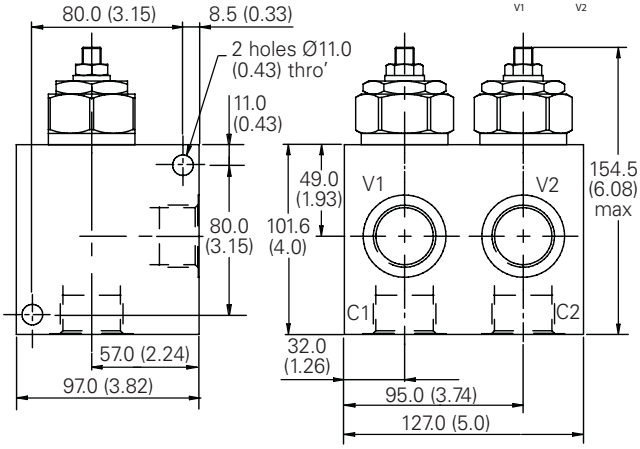


Single valve
1 1/4" Ports
Basic Code
1CE350



Dual valve
1 1/4" Ports
Basic code 1CEE350
Internally Cross Piloted





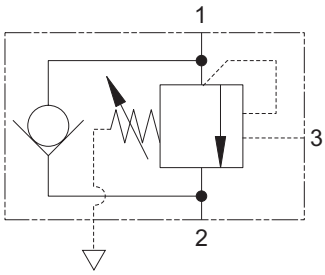
Note: For applications above 210 bar - please consult our technical department or use the steel body option.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

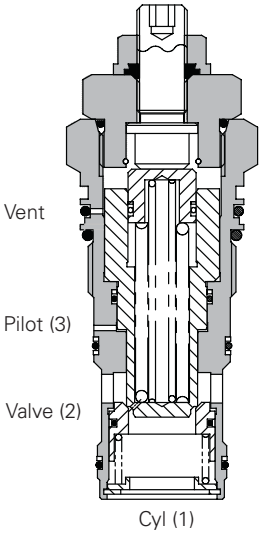
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEB300 - Overcenter valve

Fully balanced, pilot assisted
300 L/min (80 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They prevent runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced valve is unaffected by back pressure, allowing service line reliefs to operate and for the valve to be used in regenerative or proportional valve systems.

The overcenter valve should be mounted either into, onto or as close to the actuator as possible to give maximum protection.

Single overcenter valves control unidirectional loads such as in aerial platforms, cranes or winches and dual overcenters are suited to bi-directional motion such as wheel motor applications or cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

3:1 Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

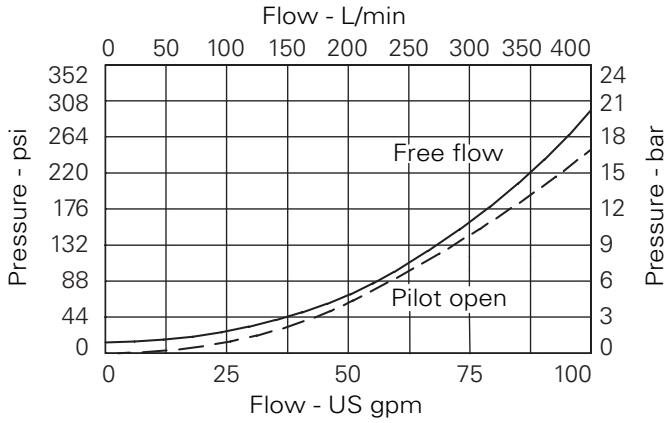
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	300 L/min (80 USgpm)
Max working pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing material	Aluminium (up to 210 bar) Add suffix "377" for steel option
Mounting position	Unrestricted
Cavity	A6935 (See Section M)
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight cartridge only	1CE300 0.91 kg (2.00 lbs) 1CE350 2.71 kg (5.96 lbs) 1CEE350 5.42 kg (11.92 lbs)
Seal kit	SK686 (Nitrile) SK686V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30°C to +90°C (-22° to +194°F)
Internal leakage	4 milliliters/min nominal (60 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CE*****	–	F	10W	–	35	S	3
1		2	3		4	5	6

1 Basic code

1CEB300 - Cartridge only

1CEB350 - Cartridge and Body

1CEEB350 - Cartridges and Body

2 Adjustment means

F - Screw adjustment

3 Port sizes

Code	Port size	Housing number - body only			
		Aluminium single	Steel single	Aluminium dual	Steel dual
10W	1 1/4" BSP Valve & Cyl Port 1/4" BSP Pilot Port	B6814	B8610	C8704	C8705
20T	1 1/4" SAE Valve & Cyl Port 1/4" SAE Pilot Port	B10630	B11474	C10811	C11564

4 Pressure Range @4.8 L/min

Note: Code based on pressure in bar.

35 - 70-350 bar.
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot ratio

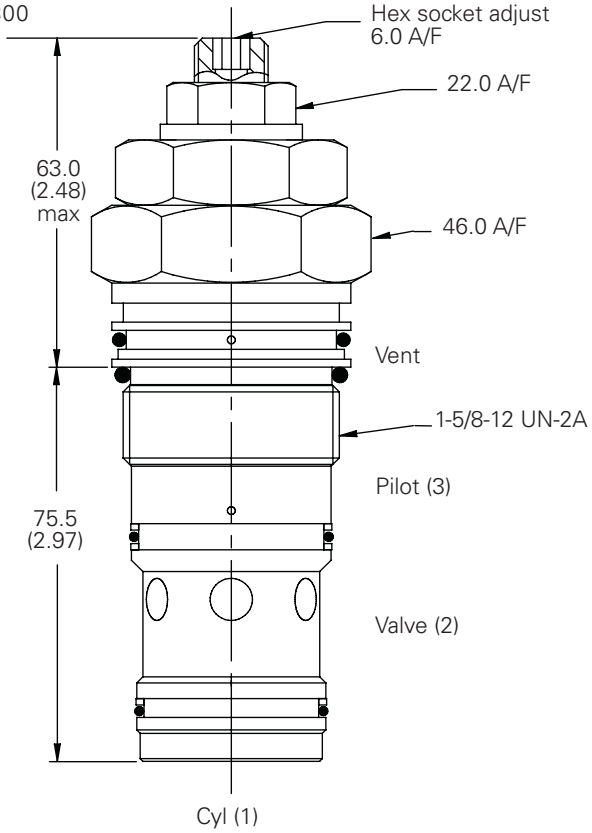
3 - 3:1 - (Standard)

8 - 8:1

Dimensions

mm (inch)

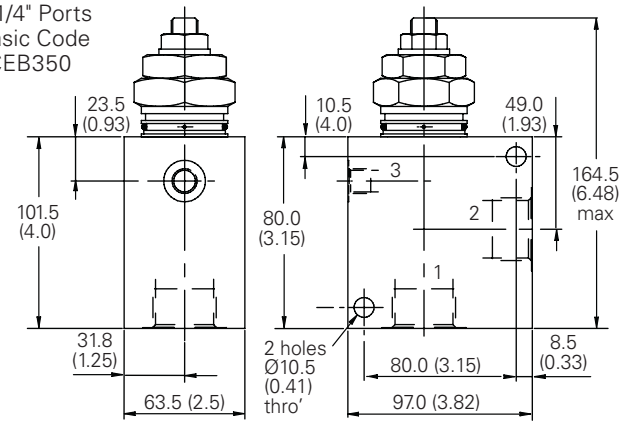
Cartridge only
Basic Code
1CEB300



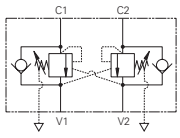
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

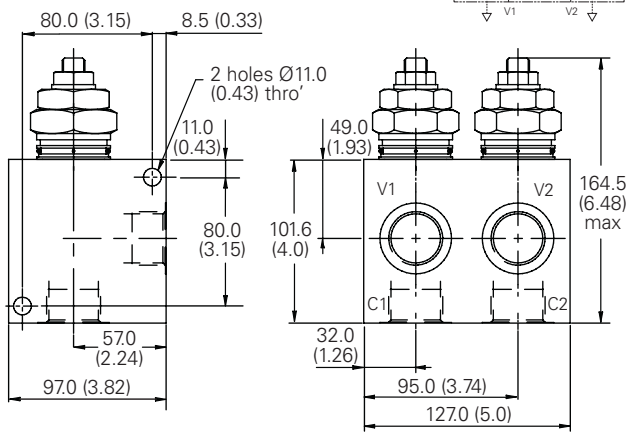
Note: For applications above 210 bar - please consult our technical department or use the steel body option.

Single valve
1 1/4" Ports
Basic Code
1CEB350



Dual valve
1 1/4" Ports
Basic Code 1CEEB350
Internally Cross Piloted

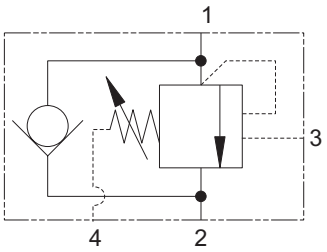




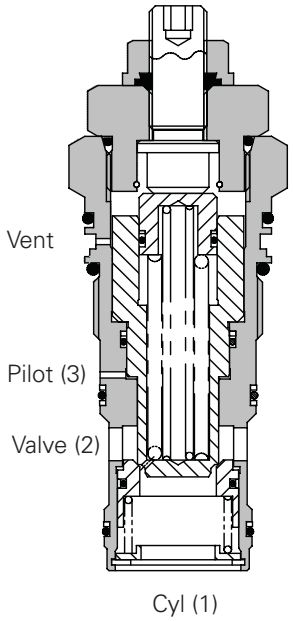
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBD300 - Overcenter valve

Fully balanced, pilot assisted relief with check
300 L/min (80 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They prevent runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced valve is unaffected by back pressure, allowing service line reliefs to operate and for the valve to be used in regenerative or proportional valve systems.

The overcenter valve should be mounted either into, onto or as close to the actuator as possible to give maximum protection.

Single overcenter valves control unidirectional loads such as in aerial platforms, cranes or winches and dual overcenters are suited to bi-directional motion such as wheel motor applications or cylinders going over center.

Operation

"The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{(\text{Relief Setting}) - (\text{Load Pressure})}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time.

Pilot ratio

3:1 Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

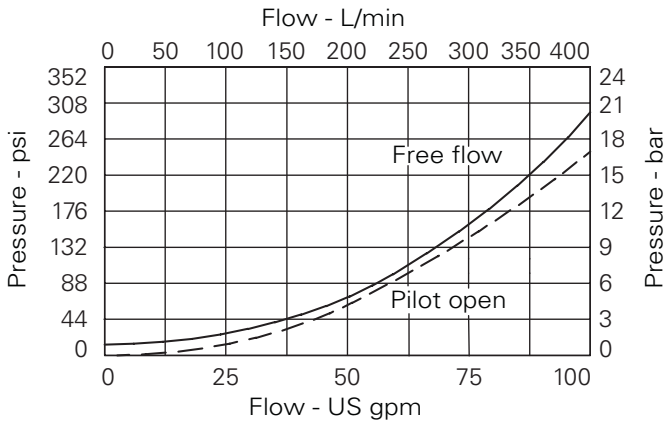
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	300 L/min (80 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Mounting position	Unrestricted
Cavity	A13098 (See Section M)
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight cartridge only	0.91 kg (2.00 lbs)
Seal kit	SK686 (Nitrile) SK686V (Viton®) SK686P (Polyurethane Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	4 milliliters/min (60 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CEBD300 – F – 35 S 3

1 2 3 4 5

1 Basic Code

1CEBD300 - Cartridge only

2 Adjustment

F - Screw adjustment

3 Pressure range @4.8 L/min

Note: Code based on pressure in bar.

35 - 70-350 bar.
Std setting 210 bar

Std setting made at 4.8 L/min

4 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

P - Polyurethane/Nitrile (For arduous applications)

5 Pilot ratio

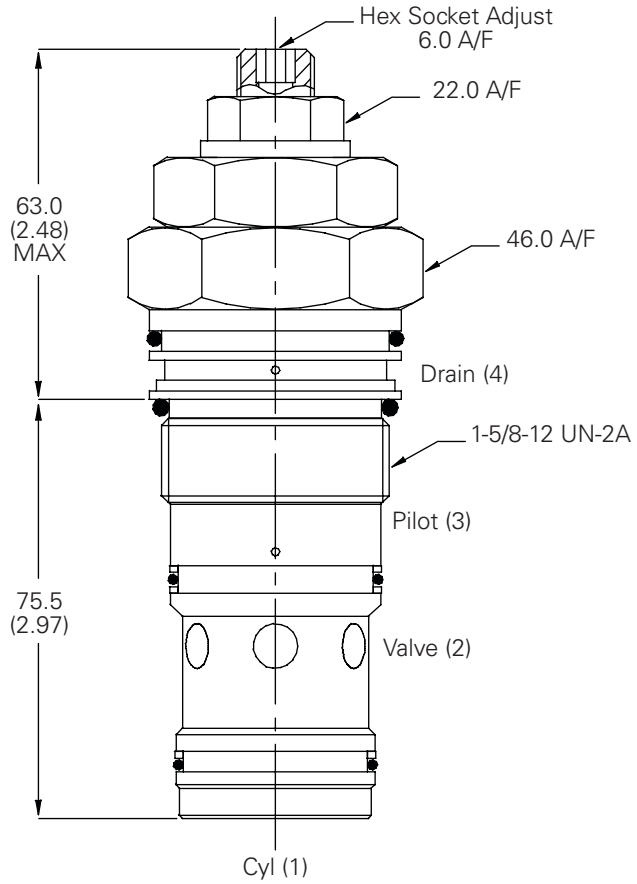
3 - 3:1 - (Standard)

8 - 8:1

Dimensions

mm (inch)

Cartridge only
Basic Code
1CEBD300

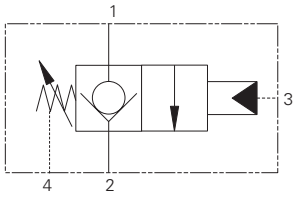


Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

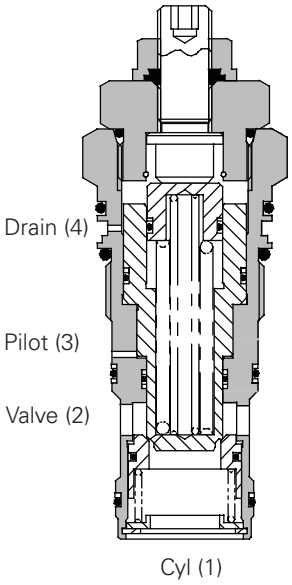
F

1CPBD300 - Overcenter valve

Zero differential with check
300 L/min (80 USgpm) • 400 bar (5800 psi)



Sectional view



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. By the application of pilot pressure to the pilot port the poppet moves back against the main spring opening the cylinder port to the valve port. The metering characteristic of the valve is controlled by the rate of the spring, the seat angle and the pilot pressure applied.

Due to the balanced poppet design load induced pressure will not open the valve and once open valve port pressure will not increase the pilot pressure required to keep the valve open.

Features

The cartridge fits a simple cavity allowing quick, easy field service reducing down time. Hardened poppet and seat provide for long leak free performance.

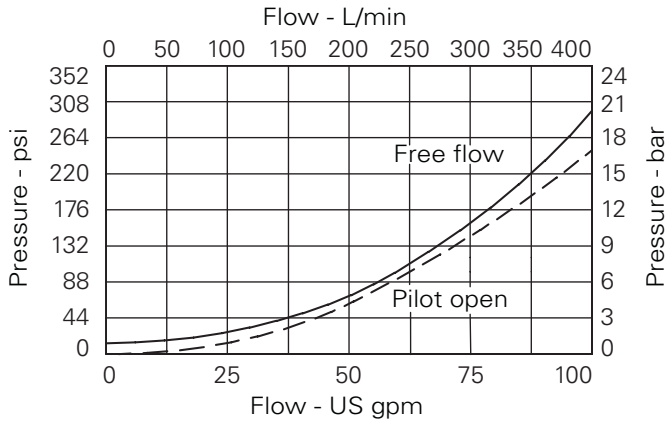
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	300 L/min (80 USgpm)
Max working pressure	400 bar (5800 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Mounting position	Unrestricted
Cavity	A13098 (See Section M)
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight cartridge only	0.91 kg (2.00 lbs)
Seal kit	SK971 (Nitrile) SK971V (Viton®) SK971P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	4 milliliters/min nominal (60 dpm)
Nominal viscosity range	5 to 500 cSt
Bar per turn	5 bar

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Description

Zero differential overcenter valves give static and dynamic control of loads by supplying a restriction to flow related to the opening of the valve created by the pilot pressure.

The valve is used in conjunction with a remote pilot source to provide hose failure protection, load control and load holding functions.

If over-pressure or shock pressure protection is required then a separate relief valve should be used.

The drain line allows the valve to be used in corrosive atmospheres preventing the ingress of atmospheric contaminant.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CPBD300	F	2	P
1	2	3	4

1 Function

1CEBD300 - Cartridge only

2 Adjustment

F - Screw adjustment

3 Pilot adjust range

Note: Code based on pressure in bar.

2 - 5-20 bar. Std setting 10 bar

Std setting made at 4.8 L/min

4 Seal material

S - Nitrile (For use with most industrial hydraulic oils)

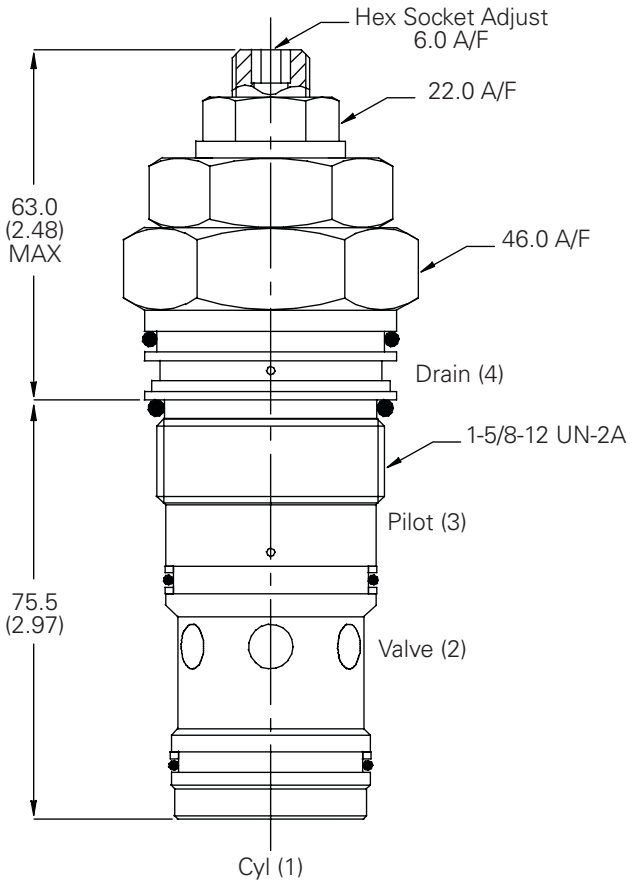
SV - Viton® (For high temperature and most special fluid applications)

P - Polyurethane/Nitrile (For arduous applications)

Dimensions

mm (inch)

Cartridge only
Basic Code
1CPBD300



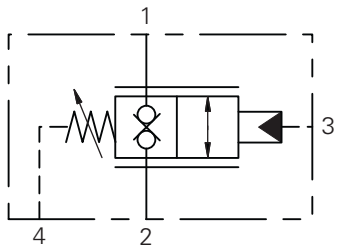
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CPPD300 - Piloted Bi-directional poppet valve

Poppet, pilot operated, normally closed, zero differential
300 L/min (80 USgpm) • 350 bar (5000 psi)



Operation

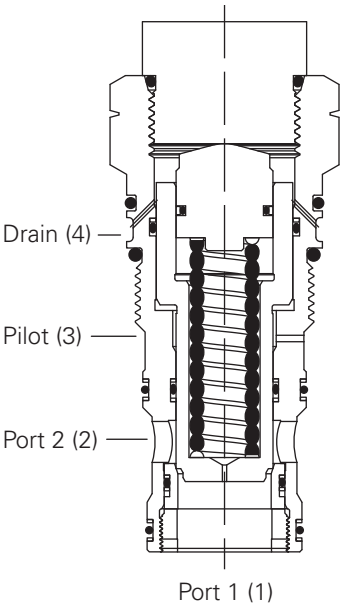
By the application of pilot pressure to the pilot port the poppet moves back against the main spring opening. The metering characteristic of the valve is controlled by the rate of the spring, the seat angle and the pilot pressure applied.

Due to the balanced poppet design load induced pressure will not open the valve and once open valve port pressure will not increase the pilot pressure required to keep the valve open.

Features

The cartridge fits a simple cavity allowing quick, easy field service reducing down time. Hardened poppet and seat provide for long leak free performance.

Sectional view



Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	300 L/min (80 USgpm)
Max working pressure	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces Nickel / Zinc plated.
Mounting position	Unrestricted
Cavity	A13098 (See Section M)
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight cartridge only	1.02 kg (2.25 lbs)
Seal kit	SK1454 (Nitrile) SK1454V (Viton®) SK1454P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	4 milliliters/min nominal (60 dpm)
Nominal viscosity range	5 to 500 cSt

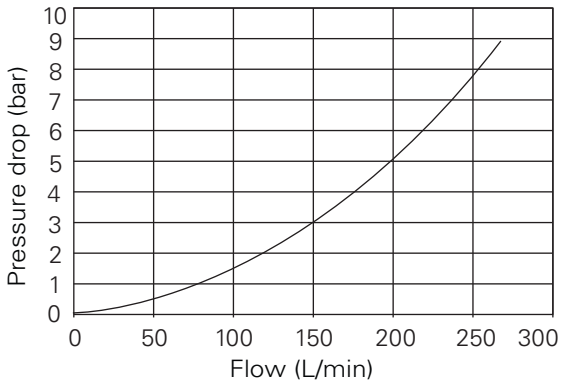
Viton is a registered trademark of E.I. DuPont.

Description

Normally closed pilot operatedzero differential bi directional poppet valve providing flow control by application of pilot pressure to actuate the poppet and increase the flow path

Balanced construction ensures predictable switching regardless of pressure in port 1 or 2. The drain line allows the valve to be used in corrosive atmospheres preventing the ingress of atmospheric contamination.

Pilot open pressure drop - both directions



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CPPD300 - Piloted Bi-directional poppet valve

Poppet, pilot operated, normally closed, zero differential
300 L/min (80 USgpm) • 350 bar (5000 psi)

Model code

1CPPD300	N	2	P
1	2	3	4

1 Function

1CPPD300 - Cartridge only

2 Adjustment

N - Fixed - State pressure setting required

3 Pilot pressure

Note: Code based on pressure in bar.

2 - 14 bar.

Std setting made at 4.8 L/min

4 Seal material

S - Nitrile (For use with most industrial hydraulic oils)

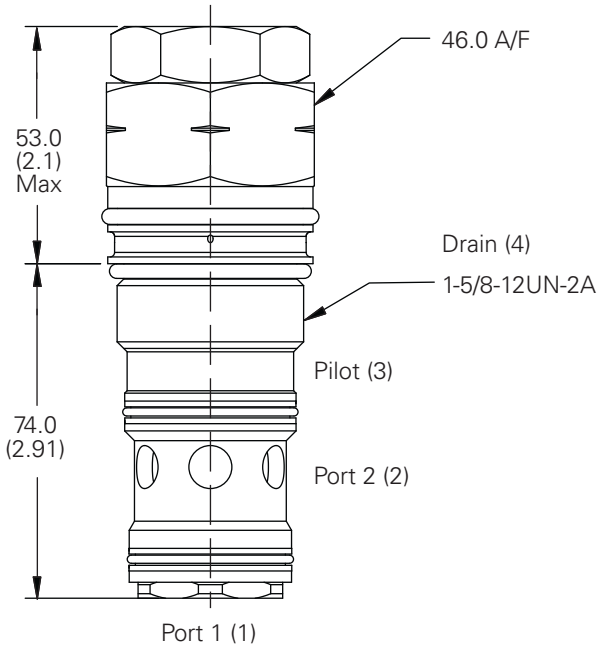
SV - Viton® (For high temperature and most special fluid applications)

P - Polyurethane/Nitrile (For arduous applications)

Dimensions

mm (inch)

Cartridge only
Basic Code
1CPPD300



F

1CE356 Series - Overcenter valve

Alternative body arrangements for 300 L/min valves

Model code

1CE****	F	10W	35	S	3
1	2	3	4	5	6

1 Function

1CE356 - Cartridge and Body Through Ported

1CEG350 - Cartridge and Body Gasket Mounted

2 Adjustment

F - Screw adjustment

3 Port size - bodied valves only

Code	Port size	Housing number	
1CE356 Through Ported, Body Only		**Aluminium**	**Steel**
10W	1 1/4" BSP Valve & Cyl Port 1/4" BSP Pilot Port	C13637	C13638
1CEG356 Gasket Mounted, Sub Assembly			
10W	1 1/4" BSP Valve & Cyl Port 1/4" BSP Pilot Port	CXP20647-10W-S	CXP20647-10W-S-377

4 Pressure range

Note: Code based on pressure in bar.

35 - 70-350 bar.
Std setting 210 bar
(10:1): 100-210 bar

Std setting made at 4.8 L/min

5 Seal material

S - Buna-N

SV - Viton

6 Pilot ratio

3 - 3:1 - (Standard)

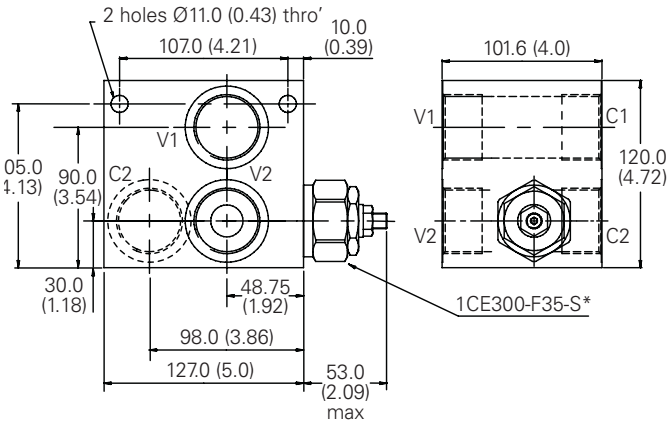
8 - 8:1

F

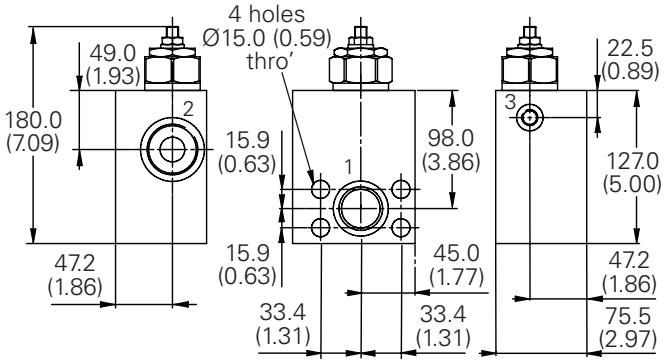
Dimensions

mm (inch)

Complete valve - through ported
1 1/4" Ports
Basic Code
1CE356



Complete valve - gasket mounted
1 1/4" Ports
Basic Code
1CEG350



Note: For applications above 210 bar - please consult our technical department or use the steel body option.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

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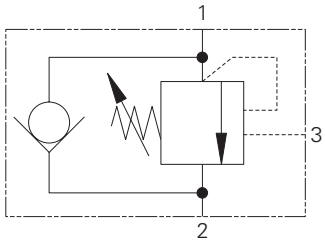
Eaton's integrated systems help harvest the inexhaustible green power of wind. In constant use under the harshest conditions, wind turbines demand extreme reliability and durability from every component. Eaton is a world leading manufacturer of those critical hydraulic, electrical and filtration products.

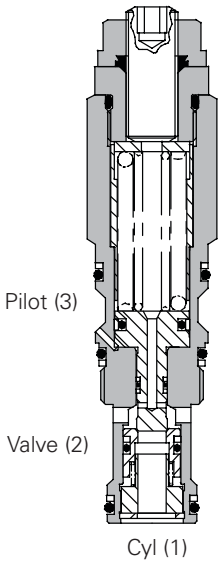
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SE30 - Overcenter valve

Pilot assisted relief with check
30 L/min (8 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

2.5:1 Best suited for extremely unstable applications such as long booms or flexible frameworks.

5:1 (standard) Best suited for applications where load varies and machine structure can induce instability.

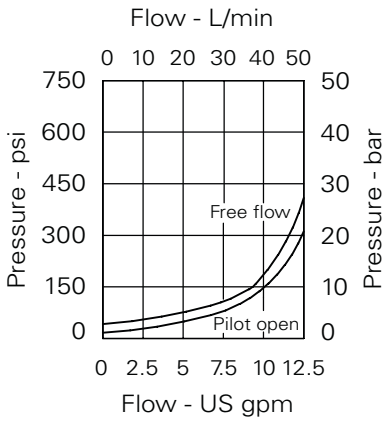
10:1 Best suited for applications where the load remains relatively constant.

Performance data

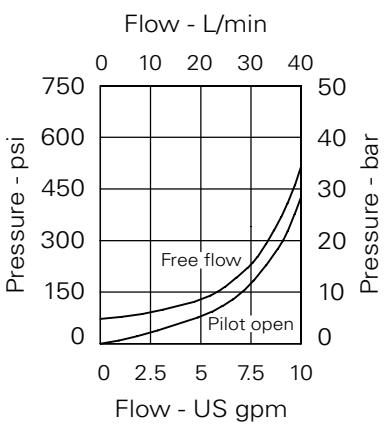
Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20090-T11A
Torque cartridge into cavity	45 Nm (33 lbs ft)
Weight	0.15 kg (0.33 lbs)
Seal kit number	SK1079 (Nitrile) SK1079V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Pressure drop



2:5:1 and 5:1 version



10:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SE30 – F – 35 S 5

1 2 3 4 5

1 Function

1SE30

2 Adjustment means

F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range

Note: Code based on pressure in bar.h

20 - (All pilot ratios): 70-225 bar. Std setting 100 bar

35 - (2.5:1 and 5:1): 70-350 bar. Std setting 210 bar
(10:1): 90-350 bar. Std setting 210 bar

Std setting made at 4.8 L/min
Other pressure ranges available on request

4 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

5 Pilot ratio

2 - 2.5:1

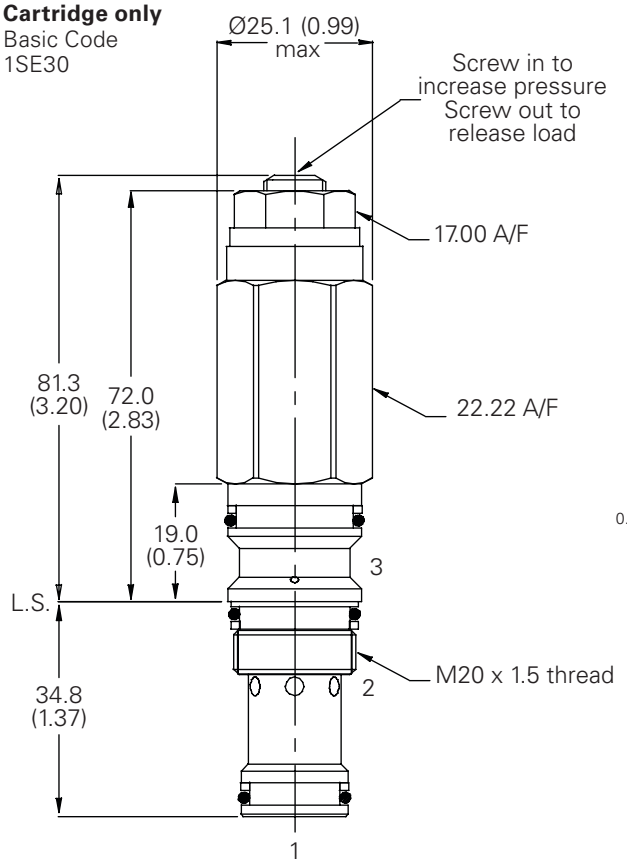
5 - 5:1

10 - 10:1

Dimensions

mm (inch)

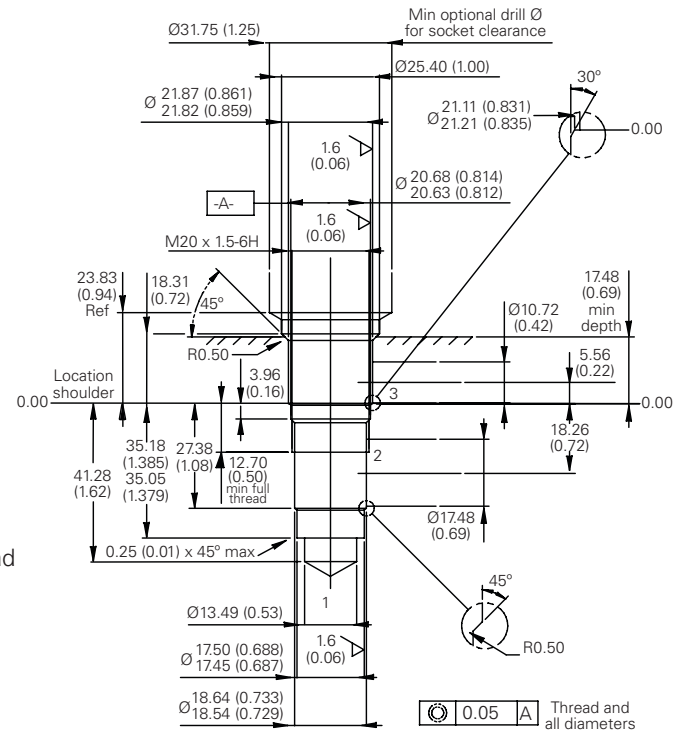
Cartridge only
Basic Code
1SE30



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Cavity

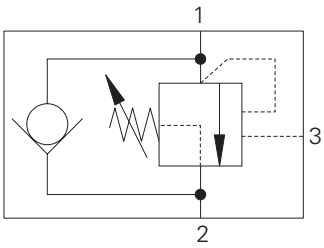
Model	A20090-
T11A	Form Drill
TD-11A	
Form Reamer	TD-11A



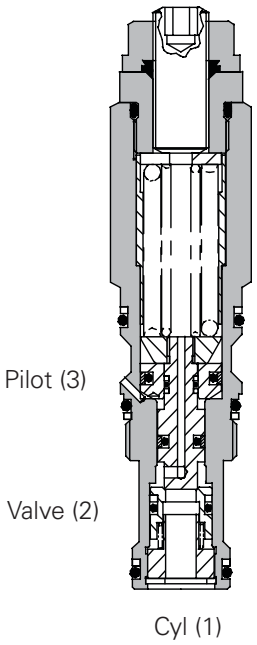
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SER30 - Overcenter valve

Part balanced, pilot assisted relief with check
30 L/min (8 USgpm) • 270 bar (4000 psi)



Sectional view



Description

The 1SER series overcenter valve performs all duties of a regular overcenter but is able to relieve and stay open irrespective of downstream pressure. This enables the valve to operate when used with a closed center directional valve which has service line reliefs. The poppet is pressure balanced, preventing relief setting increase due to back pressure.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

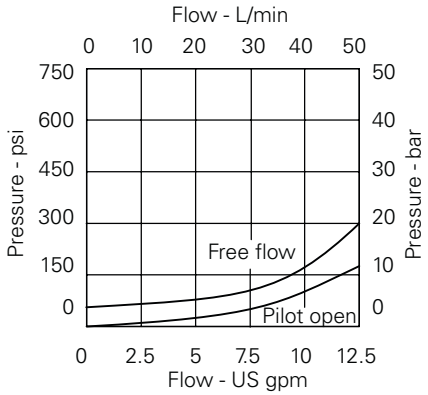
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20090-T11A
Torque cartridge into cavity	45 Nm (33 lbs ft)
Weight	0.15 kg (0.33 lbs)
Seal kit number	SK1079 (Nitrile) SK1079V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SER30 – F – 35 S 4

1 2 3 4 5

1 Function
1SER30

2 Adjustment means
F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range @ 4.8 L/min
Note: Code based on pressure in bar.

35 - 75-350 bar
Std setting 210 bar
Std setting made at 4.8 L/min

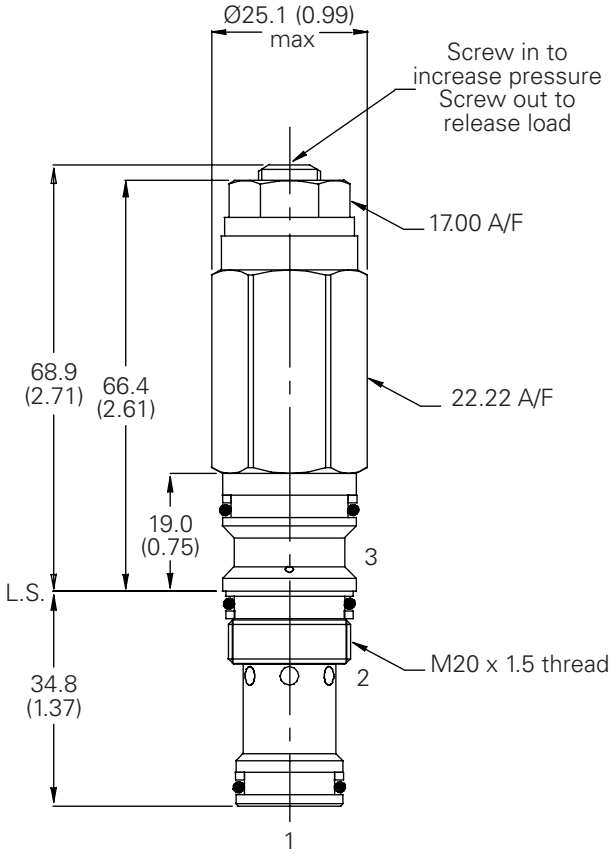
4 Seals
S - Nitrile
(For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

5 Pilot ratio
4 - 4:1

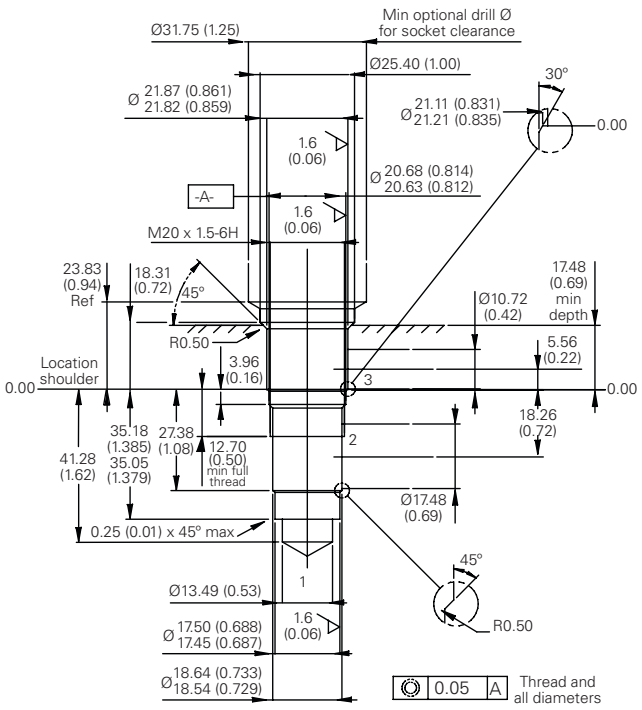
Dimensions
mm (inch)

Cartridge only
Basic Code
1SER30



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Cavity
Model A20090-T11A
Form Drill TD-11A
Form Reamer TR-11A

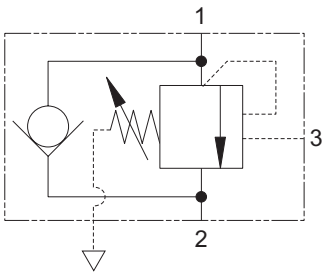


F

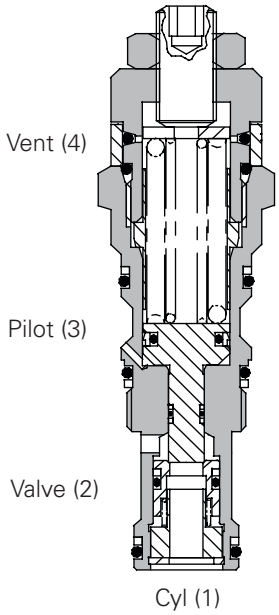
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SEB30 - Overcenter valve

Fully balanced, pilot assisted relief with check
30 L/min (8 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They prevent runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced valve is unaffected by back pressure, allowing service line reliefs to operate and for the valve to be used in regenerative or proportional valve systems.

The overcenter valve should be mounted either into, onto or as close to the actuator as possible to give maximum protection.

Single overcenter valves control unidirectional loads such as in aerial platforms, cranes or winches and dual overcenters are suited to bi-directional motion such as wheel motor applications or cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

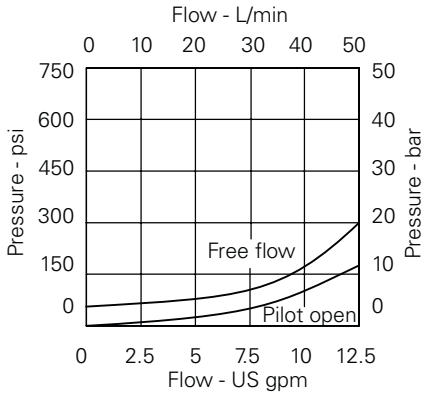
5:1

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20090-T11A
Torque cartridge into cavity	45 Nm (33 lbs ft)
Weight	0.14 kg (0.30 lbs)
Seal kit number	SK1079 (Nitrile) SK1079V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SEB30 – F – 35 S 5

1 2 3 4 5

1 Function

1SEB30

2 Adjustment means

F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - 75-350 bar
Std setting 210 bar
Std setting made at 4.8 L/min

4 Seals

S - Nitrile
(For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

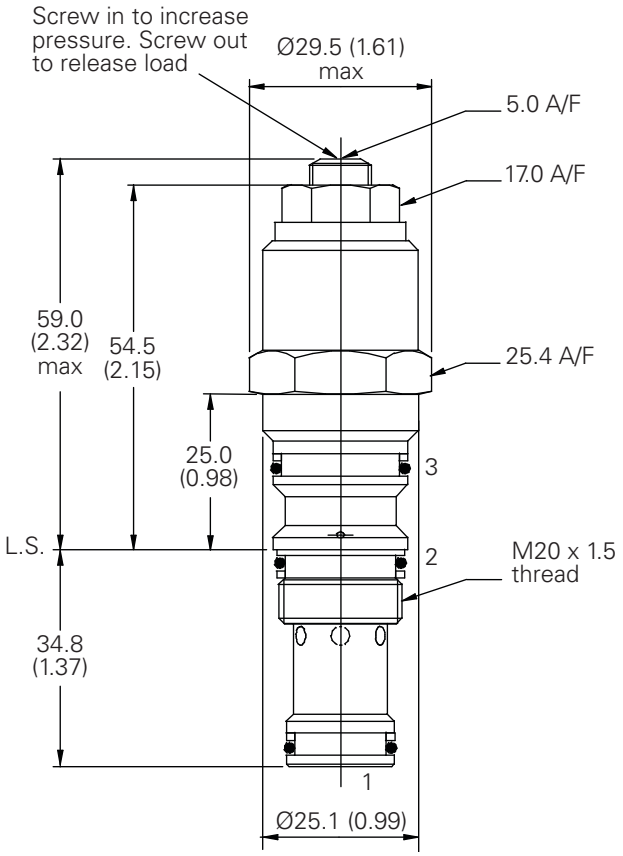
5 Pilot ratio

5 - 5:1

Dimensions

mm (inch)

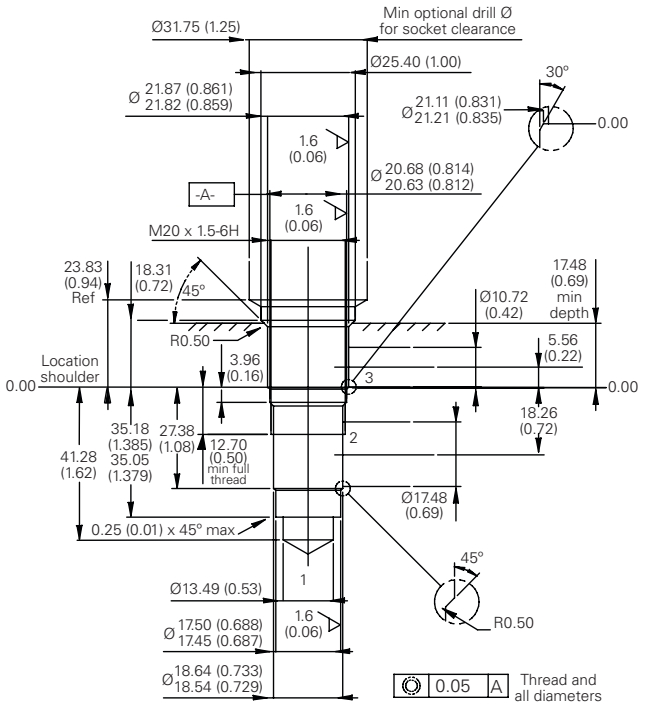
Cartridge only
Basic Code
1SEB30



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

Cavity

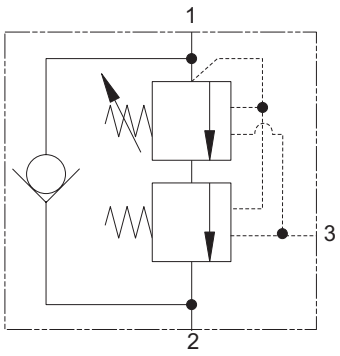
Model	A20090-T11A
Form Drill	TD-11A
Form Reamer	TR-11A



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SEL30 - Overcenter valve

Counterbalanced, pilot assisted relief with check
30 L/min (8 USgpm) • 380 bar (5510 psi)



Operation

The check section allows free flow and then locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied, maintaining a counterbalance pressure to prevent initial pressure loss and therefore instability. The total pressure setting will normally be set at 1.3 times the load induced pressure. The counterbalance pressure reduces as the pilot pressure increases.

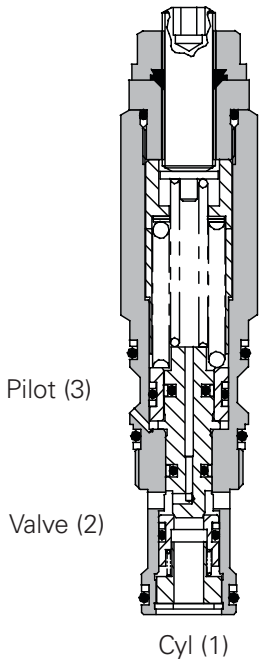
Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

Primary 4.3:1
Secondary 0.4:1

Sectional view



Performance data

Ratings and specifications

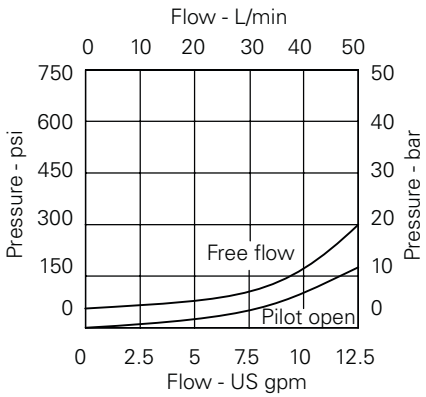
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max setting	380 bar (5510 psi)
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20090-T11A
Torque cartridge into cavity	45 Nm (33 lbs ft)
Weight	0.15 kg (0.33 lbs)
Seal kit number	SK1079 (Nitrile) SK1079V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Description

The 1SEL overcenter valve performs all duties of a regular overcenter but maintains a counterbalance pressure to provide dampening of cylinders when there is a rapid loss in stored pressure. This counterbalance pressure reduces as the pilot pressure increases. Typical applications include extension cylinders on telescopic handlers where it is important to have a smooth operation when retracting from full extension.

Pressure drop



Note: This valve has been designed to eliminate instability from flexible boom applications or where the load induced pressure varies greatly. To get the best results, the settings should be adjusted for each application and then factory set for porduction quantities. Please contact our Technical Department for more information.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SEL30 – F – 30 S 230 / 50

1 2 3 4 5 6

1 Function

1SEL30

2 Adjustment means counterbalance setting

F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 170-300 bar Std setting 220 bar (170/50)

30 - 240-370 bar Std setting 280 bar (230/50)

40 - 270-380 bar Std setting 350 bar (300/50)

Std setting at 4.8 L/min

4 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

5 High pressure setting bar

(10 bar increments)

130 to 310 bar (2175 to 5000 psi)

6 Counterbalance setting bar

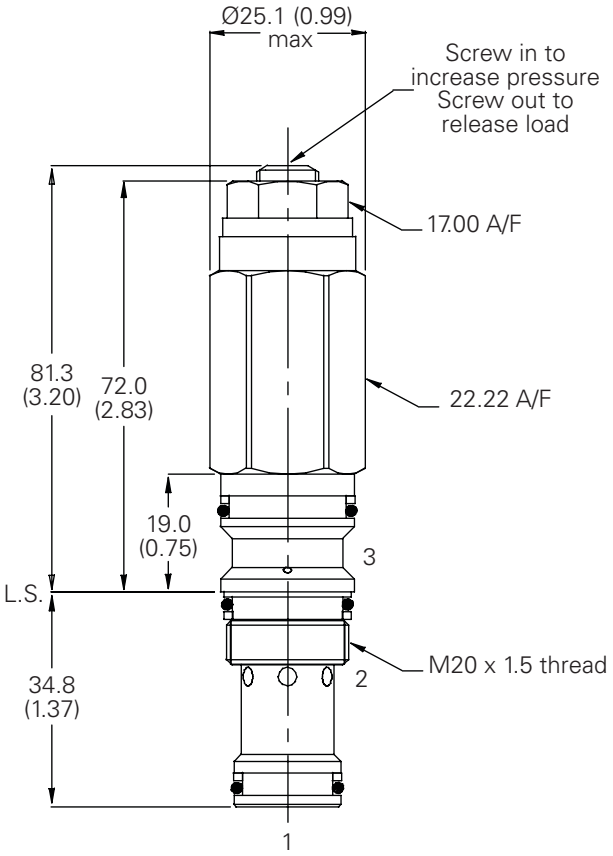
(10 bar increments)
20 to 120 bar (300 to 1740 psi)

Dimensions

mm (inch)

Cartridge only

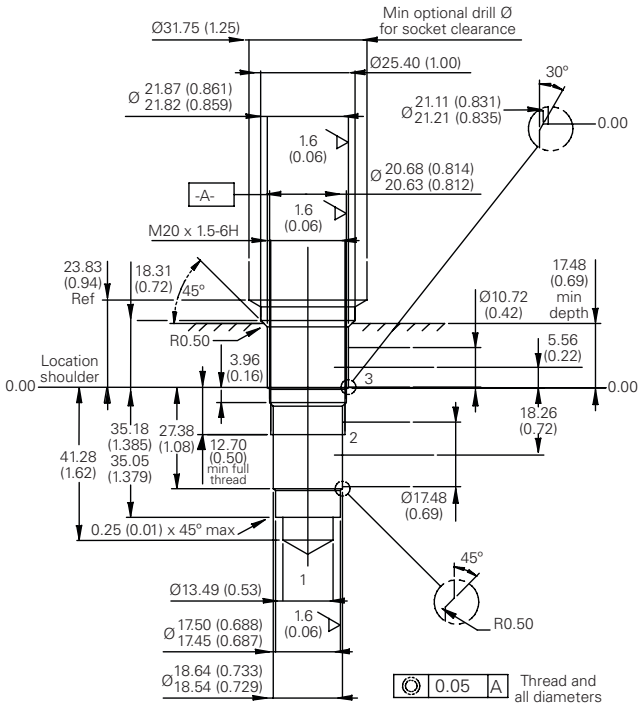
Basic Code
1SEL30



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Cavity

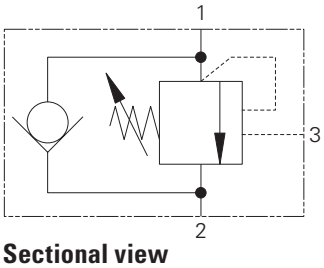
Model	A20090-T11A
Form Drill	TD-11A
Form Reamer	TR-11A



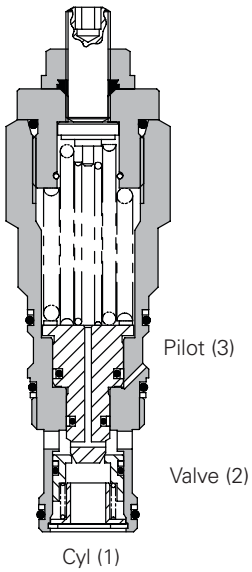
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SE90 - Overcenter valve

Pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where the load remains relatively constant.

Other ratios available on request.

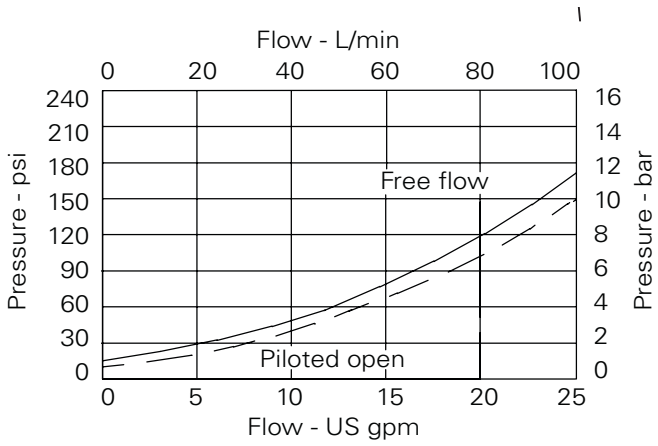
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure:	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20092-T2A
Torque cartridge into cavity	60 Nm (44 lbs ft)
Weight	0.42 kg (0.92 lbs)
Seal kit number	SK1093 (Nitrile) SK1093V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SE90 – F – 35 S 4

1 2 3 4 5

1 Function

1SE90

2 Adjustment means

F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 70-225 bar
Std setting 100 bar

35 - 200-350 bar
Std setting 210 bar

Std setting made at 4.8 L/min

4 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

5 Pilot ratio

4 - 4:1

8 - 8:1

Other ratios available upon request

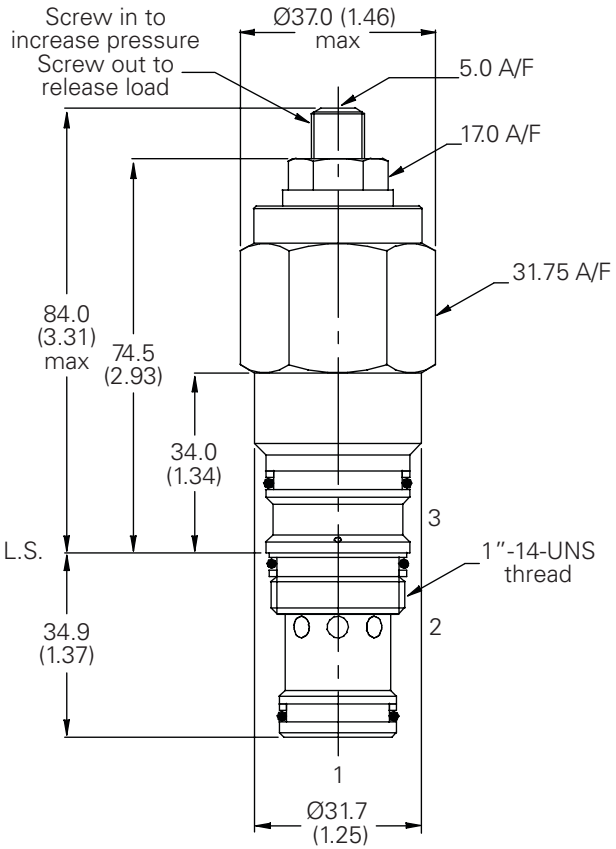
Dimensions

mm (inch)

Cartridge only

Basic code

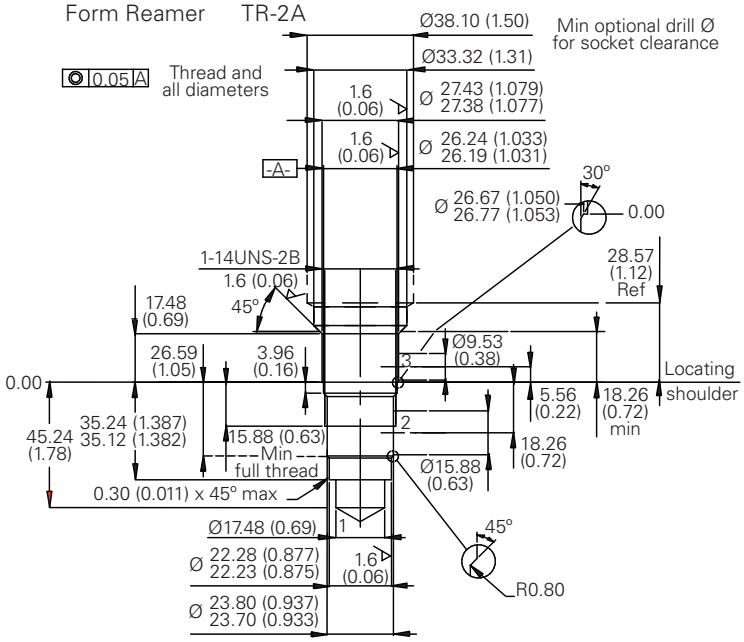
1SE90



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Cavity

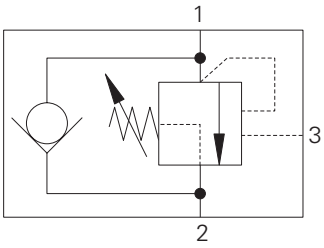
Model	A20092-T2A
Form Drill	TD-2A
Form Reamer	TR-2A



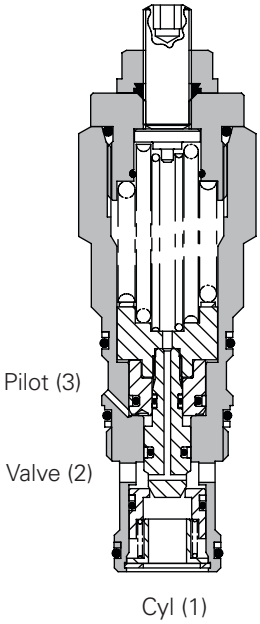
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SER90 - Overcenter valve

Part balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)



Sectional view



Description

The 1SER series overcenter valve performs all duties of a regular overcenter but is able to relieve and stay open irrespective of downstream pressure. This enables the valve to operate when used with a closed center directional valve which has service line reliefs. The poppet is pressure balanced, preventing relief setting increase due to back pressure.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where the load remains relatively constant.

Other ratios available on request.

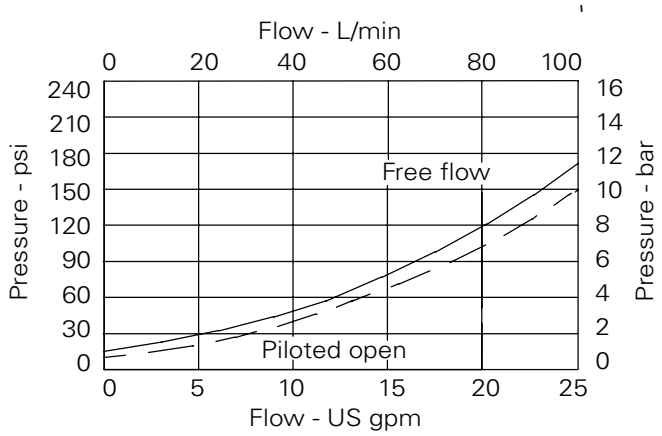
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure:	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20092-T2A
Torque cartridge into cavity	60 Nm (44 lbs ft)
Weight	0.42 kg (0.92 lbs)
Seal kit number	SK1093 (Nitrile) SK1093V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Part balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)

Model code

1SER90 – F – 35 S 4

1 2 3 4 5

1 Function
1SER30

2 Adjustment means
F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range @ 4.8 L/min
Note: Code based on pressure in bar.

20 - 70-225 bar
Std setting 100 bar

35 - 70-350 bar
Std setting 210 bar

Std setting made at 4.8 L/min

4 Seals
S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

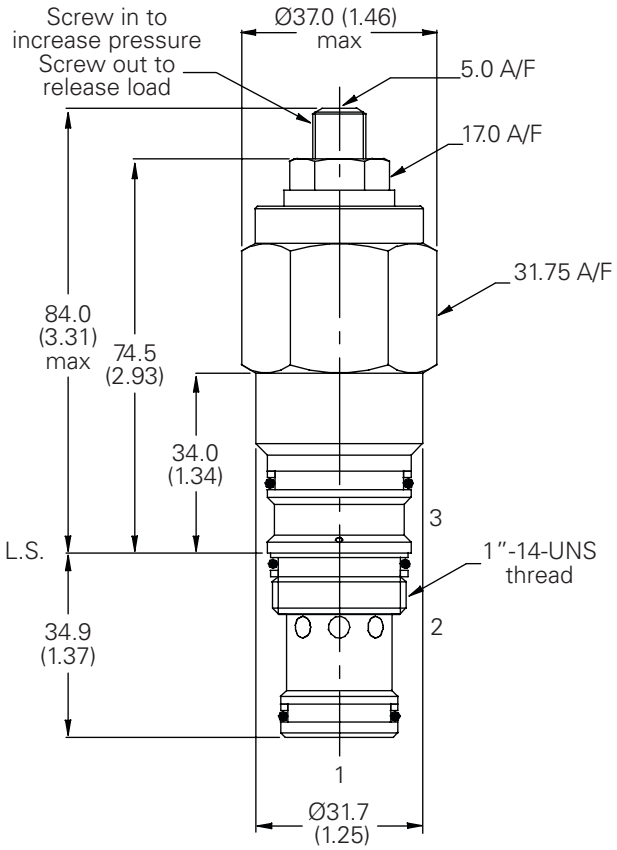
5 Pilot ratio
4 - 4:1

Other ratios available upon request

Dimensions
mm (inch)

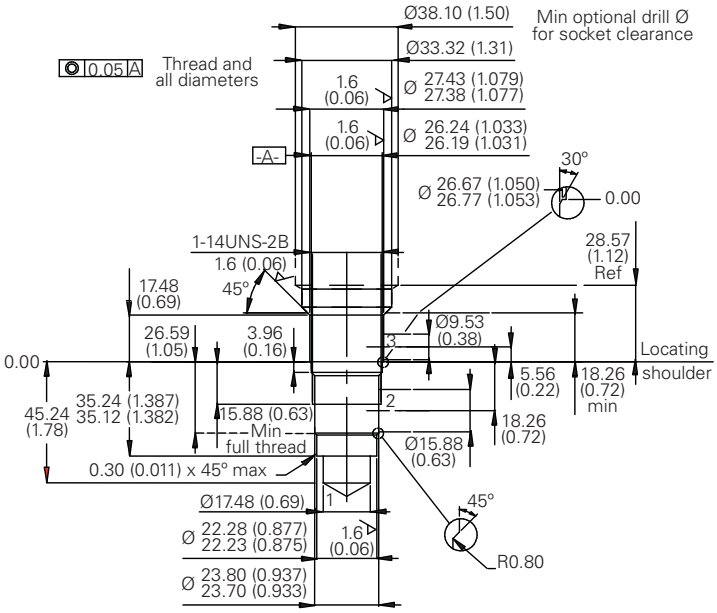
Cartridge only
Basic Code

1SER90



Cavity

Model	A20092-T2A
Form Drill	TD-2A
Form Reamer	TR-2A



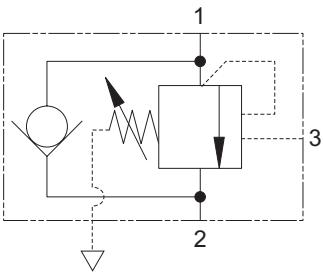
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

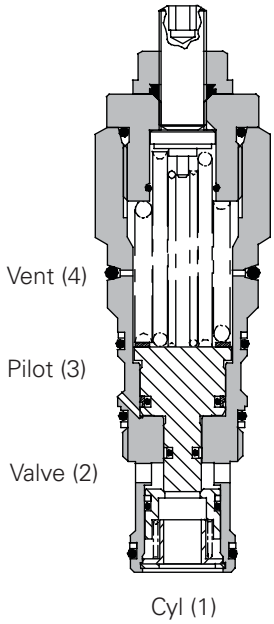
F

1SEB90 - Overcenter valve

Fully balanced, pilot assisted relief with check
90 L/min (23 USgpm) • 270 bar (4000 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by supplying a counterbalance pressure to the actuator. They prevent runaway in the event of hose burst and hold the load with minimal leakage.

The pressure balanced valve is unaffected by back pressure, allowing service line reliefs to operate and for the valve to be used in regenerative or proportional valve systems.

The overcenter valve should be mounted either into, onto or as close to the actuator as possible to give maximum protection.

Single overcenter valves control unidirectional loads such as in aerial platforms, cranes or winches and dual overcenters are suited to bi-directional motion such as wheel motor applications or cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Feature

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where the load remains relatively constant.

Other ratios available on request.

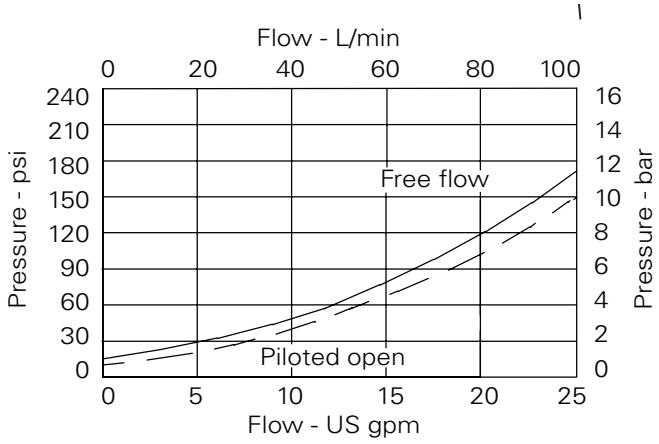
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max relief setting	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20092-T2A
Torque cartridge into cavity	60 Nm (44 lbs ft)
Weight	0.42 kg (0.92 lbs)
Seal kit number	SK1096 (Nitrile) SK1096V (Viton)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operating temperature	-30°C to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SEB90 – F – 35 S 4

1 2 3 4 5

1 Basic code

1SEB90

2 Adjustment means

F - Screw Adjustment

N -Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range

Note: Code based on pressure in bar.

20 - 70-225 bar.
Std setting 100 bar

35 - 75-350 bar.
Std setting 210 bar
Std setting made at 4.8 L/min

4 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

5 Pilot ratio

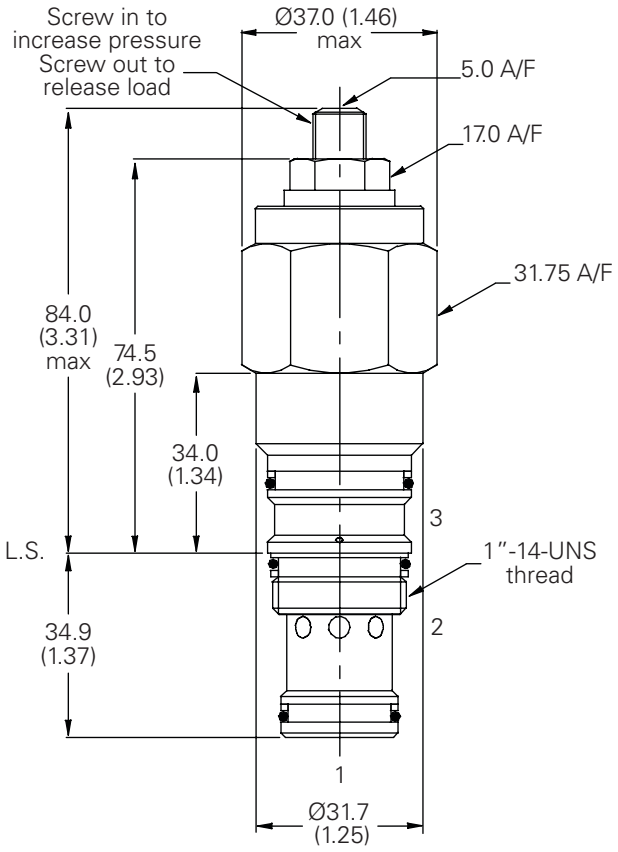
4 - 4:1

Other ratios available upon request

Dimensions

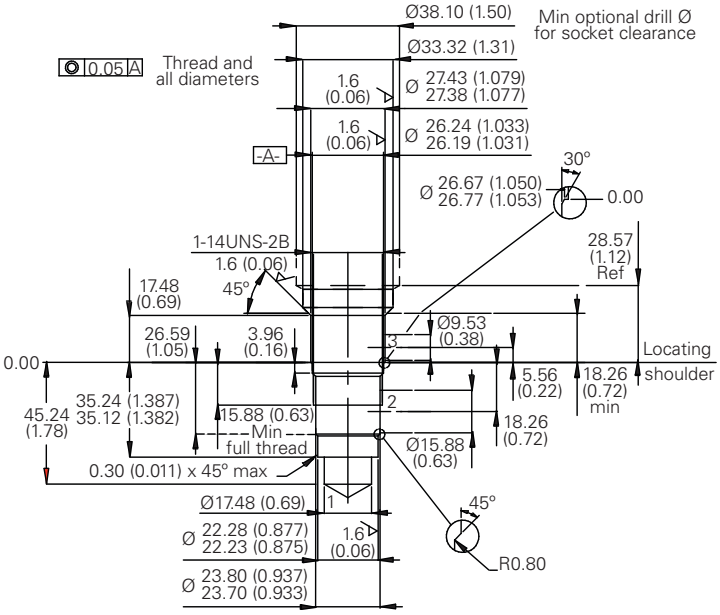
mm (inch)

Cartridge only
Basic Code
1SEB90



Cavity

Model	A20092-T2A
Form Drill	TD-2A
Form Reamer	TR-2A

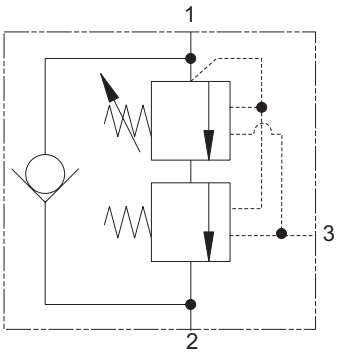


Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SEL90 - Overcenter valve

Counterbalance, pilot assisted relief with check
90 L/min (23 USgpm) • 380 bar (5510 psi)



Operation

The check section allows free flow and then locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied, maintaining a counterbalance pressure to prevent initial pressure loss and therefore instability. The total pressure setting will normally be set at 1.3 times the load induced pressure. The counterbalance pressure reduces as the pilot pressure increases.

Features

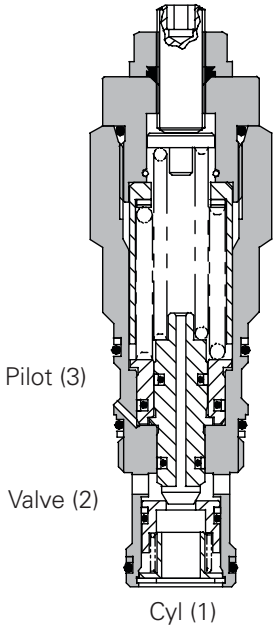
Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

Primary 5.6:1

Secondary 0.7:1

Sectional view



Performance data

Ratings and specifications

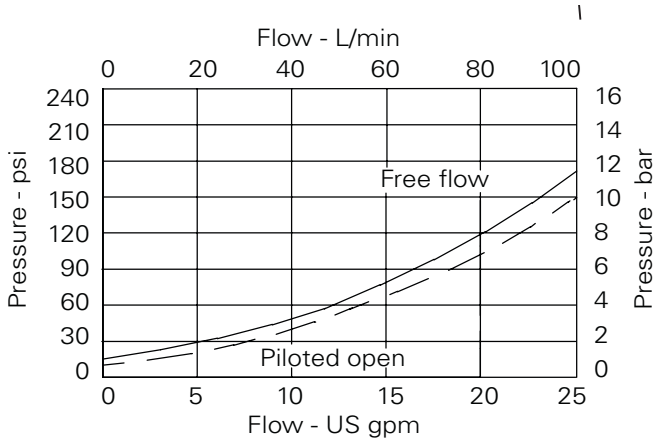
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (23 USgpm)
Max setting	380 bar (5510 psi)
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20092-T2A
Torque cartridge into cavity	60 Nm (44 lbs ft)
Weight	0.42 kg (0.92 lbs)
Seal kit number	SK1093 (Nitrile) SK1093V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operation temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Description

The 1SEL overcenter valve performs all duties of a regular overcenter but maintains a counterbalance pressure to provide dampening of cylinders when there is a rapid loss in stored pressure. This counterbalance pressure reduces as the pilot pressure increases. Typical applications include extension cylinders on telescopic handlers where it is important to have a smooth operation when retracting from full extension.

Pressure drop



Note: This valve has been designed to eliminate instability from flexible boom applications or where the load induced pressure varies greatly. To get the best results, the settings should be adjusted for each application and then factory set for porduction quantities. Please contact Technical Department for more information.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SEL90 – F – 30 S 220 60

1 2 3 4 5 6

1 Function

1SEL90 -

2 Adjustment means counterbalance setting

F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 170-350 bar
Std setting 220 bar (160/60)

35 - 210-380 bar
Std setting 250 bar (220/60)

Std setting made at 4.8 L/min

4 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

5 High pressure setting bar

(10 bar increments).
150 to 650 bar (2175 to 3335 psi)

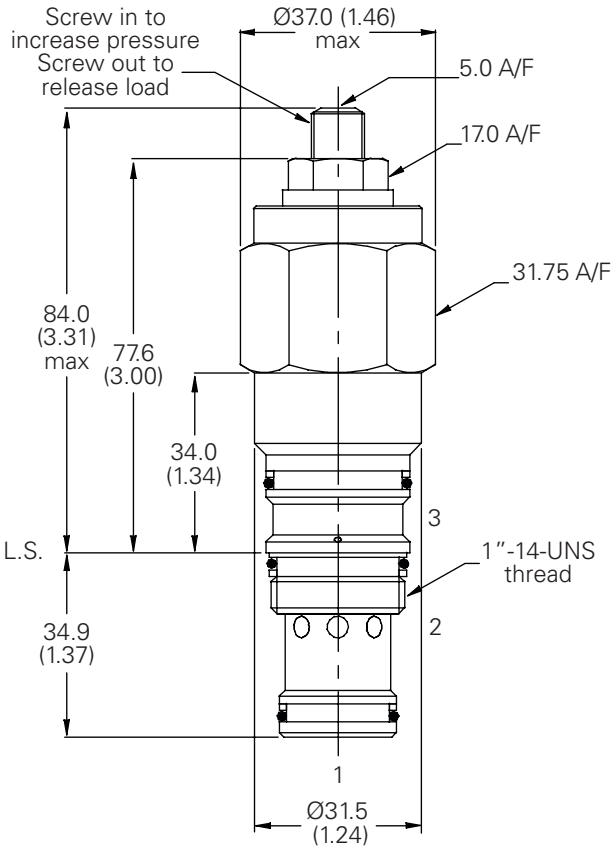
6 Counterbalance setting bar

(10 bar increments).
20 to 170 bar (100 to 250 psi)

Dimensions

mm (inch)

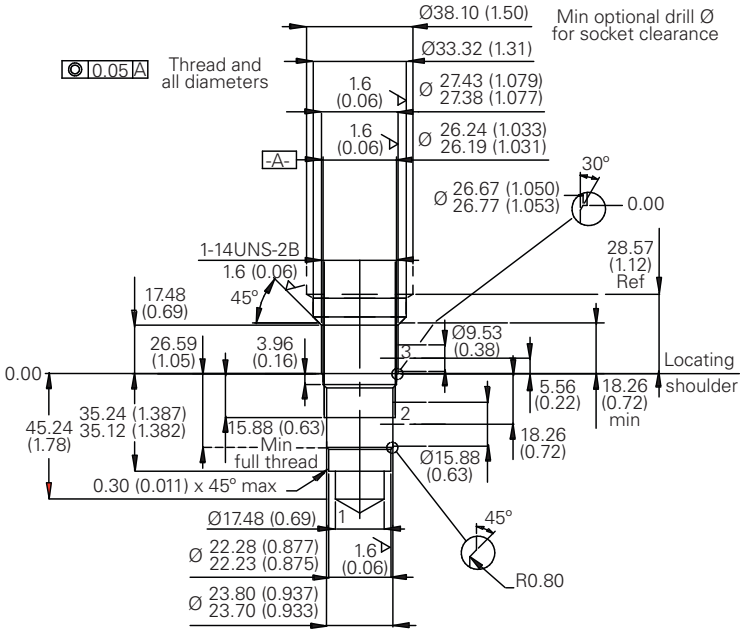
Cartridge only
Basic Code
1SEL90



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm

Cavity

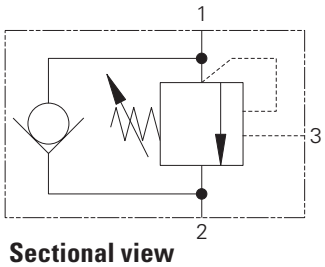
Model	A20092-T2A
Form Drill	TD-2A
Form Reamer	TR-2A



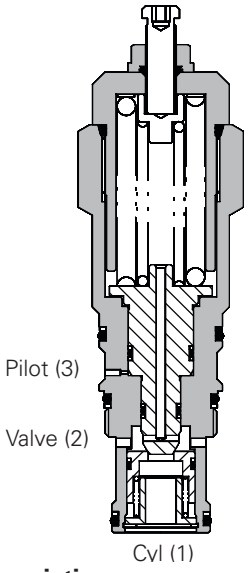
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SE140 - Overcenter valve

Pilot assisted relief with check
140 L/min (37 USgpm) • 340 bar (4930 psi)



Sectional view



Description

Overcenter valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

The overcenter cartridge is ideal for mounting directly into a cavity machined in the body of the cylinder, motor or rotary actuator. The cartridge can also be mounted directly to the ports via a specifically machined body as part of a Hydraulic Integrated Circuit or single unit, or contained within one of our standard line bodies.

Single overcenter valves are normally used when the load is unidirectional, for example an aerial platform or crane and dual overcenter valves are used for controlling loads in both directional for motor applications or for cylinders going over center.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

6:1 Best suited for applications where the load remains relatively constant.

Other options available upon request.

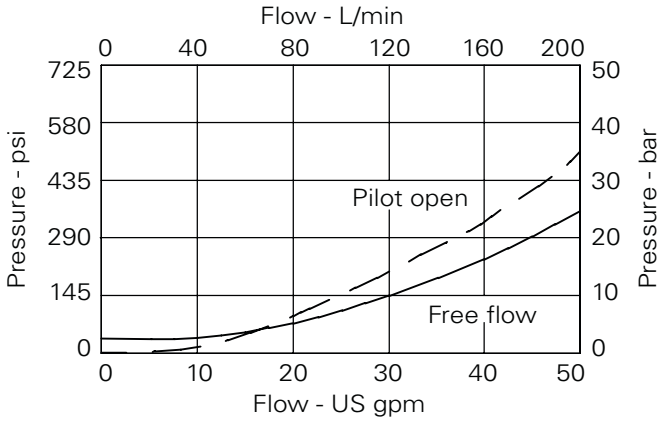
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	140 L/min (37 USgpm)
Max relief setting	420 bar (6090 psi)
Max load induced pressure	340 bar (4930 psi)
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20094-T17A
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight	1.2 kg (2.5 lbs)
Seal kit number	SK1116 (Nitrile) SK1116V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operation temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SE** – F – 40 S 4**

1 2 3 4 5

1 Basic code

1SE140

2 Adjustment means

F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 140-250 bar.
Std setting 190 bar

30 - 220-330 bar.
Std setting 270 bar

40 - 310-420 bar.
Std setting 370 bar

Std setting made at 4.8 L/min

4 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

5 Pilot ratio

4 - 4:1

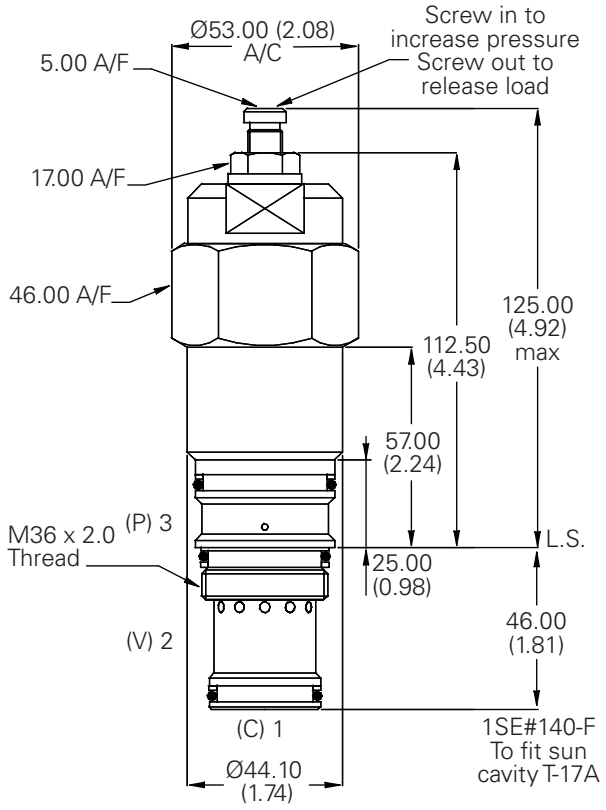
6 - 6:1

Other ratios available upon request

Dimensions

mm (inch)

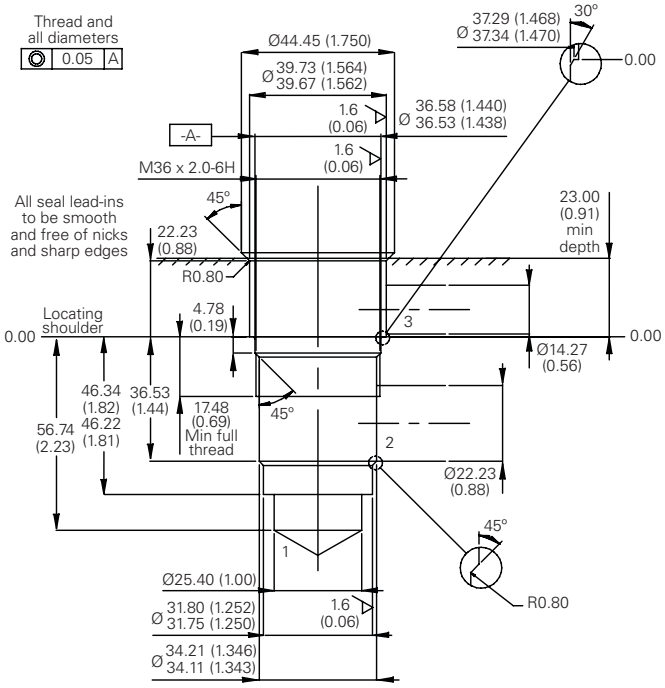
Cartridge only
Basic Code
1SE140



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Cavity

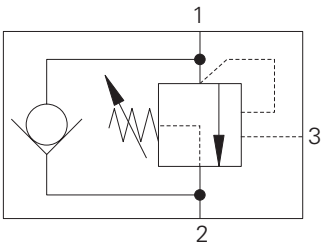
Model	A20094-T17A
Form Drill	TD-17A
Form Reamer	TR17A



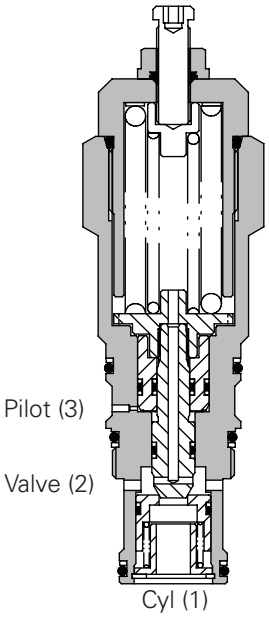
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SER140 - Overcenter valve

Part balanced pilot assisted relief with check
140 L/min (37 USgpm) • 340 bar (4930 psi)



Sectional view



Description

The 1SER series overcenter valve performs all duties of a regular overcenter but is able to relieve and stay open irrespective of downstream pressure. This enables the valve to operate when used with a closed center directional valve which has service line reliefs. The poppet is pressure balanced, preventing relief setting increase due to back pressure.

Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

6:1 Best suited for applications where the load remains relatively constant.

Other options available upon request.

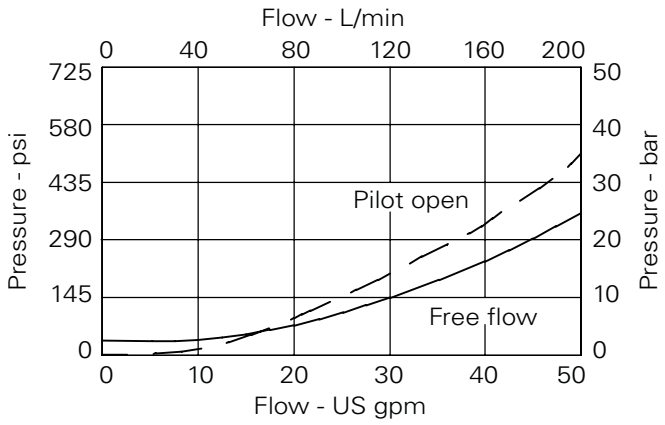
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	140 L/min (37 USgpm)
Max relief setting	420 bar (6090 psi)
Max Load Induced pressure:	340 bar (4930 psi
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20094-T17A
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight	1.2 kg (2.5 lbs)
Seal kit number	SK1116 (Nitrile) SK1116V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operation temperature	-30°C to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SER* – F – 40 S 4**

1 2 3 4 5

1 Function

1SER140

2 Adjustment means

F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20 - 140-250 bar.
Std setting 190 bar

30 - 220-330 bar.
Std setting 270 bar

40 - 310-420 bar.
Std setting 370 bar

Std setting made at 4.8 L/min

4 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

5 Pilot ratio

4 - 4:1

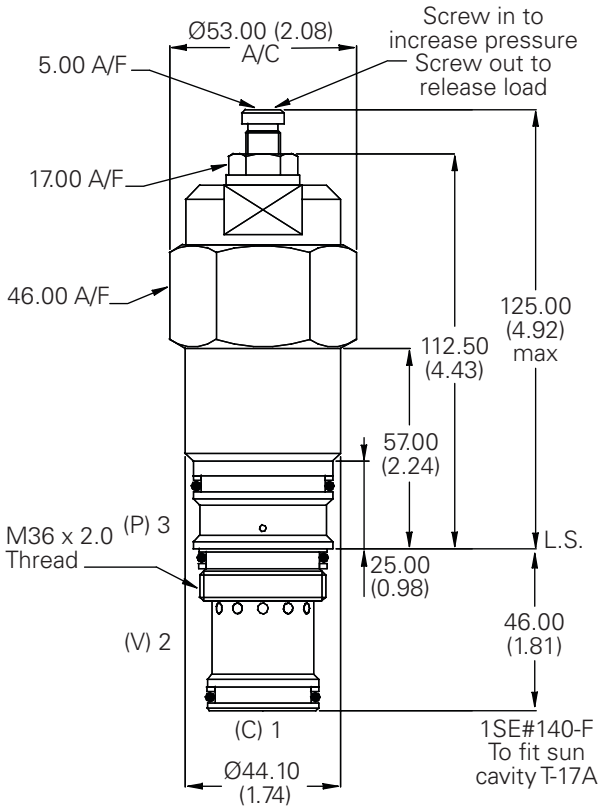
6 - 6:1

Other ratios available upon request

Dimensions

mm (inch)

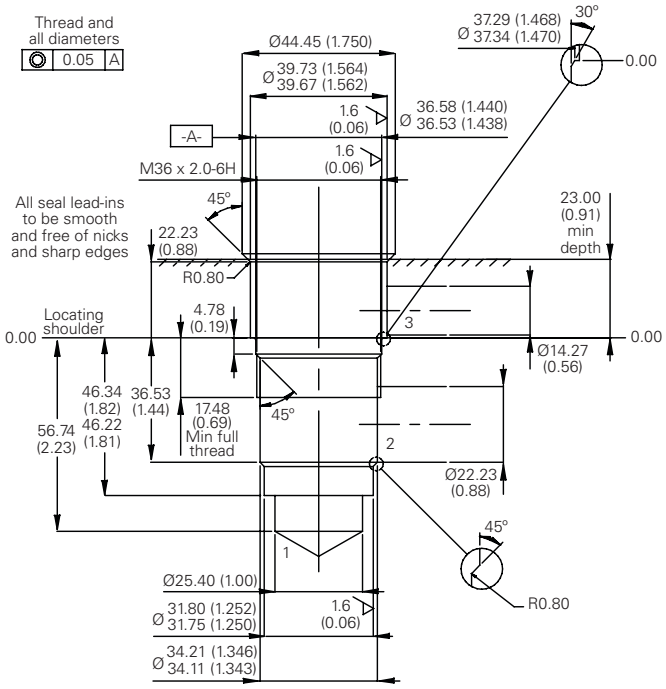
Cartridge only
Basic Code
1SER140



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Cavity

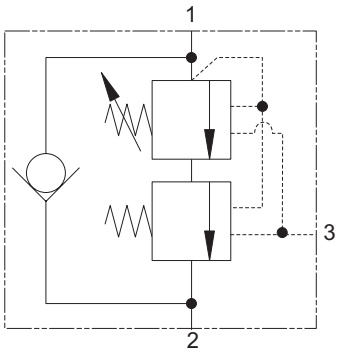
Model	A20094-T17A
Form Drill	TD-17A
Form Reamer	TR17A



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1SEL140 - Overcenter valve

Counterbalanced pilot assisted relief with check
140 L/min (37 USgpm) • 380 bar (5310 psi)



Operation

The check section allows free flow and then locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied, maintaining a counterbalance pressure to prevent initial pressure loss and therefore instability. The total pressure setting will normally be set at 1.3 times the load induced pressure. The counterbalance pressure reduces as the pilot pressure increases.

Features

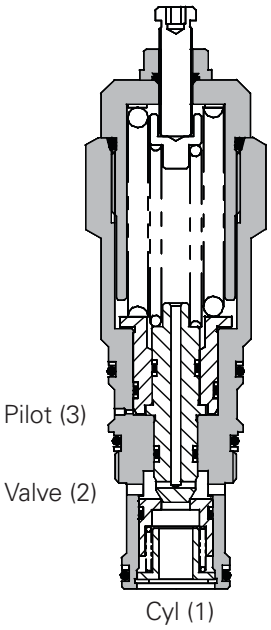
Cartridge is economical and fits simple cavity. Allows quick, easy field service - reduces down time. Interchangeable with pilot check valve of a similar size.

Pilot ratio

Primary 6.1:1

Secondary 0.5:1

Sectional view



Performance data

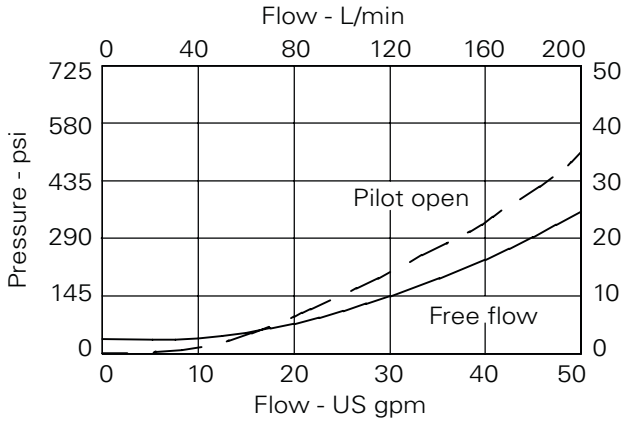
Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	140 L/min (37 USgpm)
Max setting	380 bar (5310 psi)
Cartridge material	Working parts hardened and ground steel. External steel surfaces zinc plated.
Mounting position	Unrestricted
Cavity number	A20094-T17A
Torque cartridge into cavity	150 Nm (110 lbs ft)
Weight	1.2 kg (2.5 lbs)
Seal kit number	SK1116 (Nitrile) SK1116V (Viton®)
Recommended filtration level	BS5540/4 Class 18/13 (25 micron nominal)
Operation temperature	-30° to +90°C (-22° to +194°F)
Leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Description

The 1SEL overcenter valve performs all duties of a regular overcenter but maintains a counterbalance pressure to provide dampening of cylinders when there is a rapid loss in stored pressure. This counterbalance pressure reduces as the pilot pressure increases. Typical applications include extension cylinders on telescopic handlers where it is important to have a smooth operation when retracting from full extension.

Pressure drop



Note: This valve has been designed to eliminate instability from flexible boom applications or where the load induced pressure varies greatly. To get the best results, the settings should be adjusted for each application and then factory set for porduction quantities. Please contact our Technical Department for more information.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1SEL140 – **F** – **30** **S** **220** / **60**

1 2 3 4 5 6

1 Basic code

1SEL140 - Cartridge and body

2 Adjustment means counterbalance setting

F - Screw Adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Pressure range 4.8 L/min

Note: Code based on pressure in bar.

20 - 170-320 bar. Std setting 220 bar (160/60)

30 - 230-380 bar. Std setting 280 bar (220/60)

40 - 310-380 bar. Std setting 350 bar (290/60)

4 Seals

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

5 High pressure setting bar

(10 bar increments).
150 to 350 bar (2175 to 5000 psi)

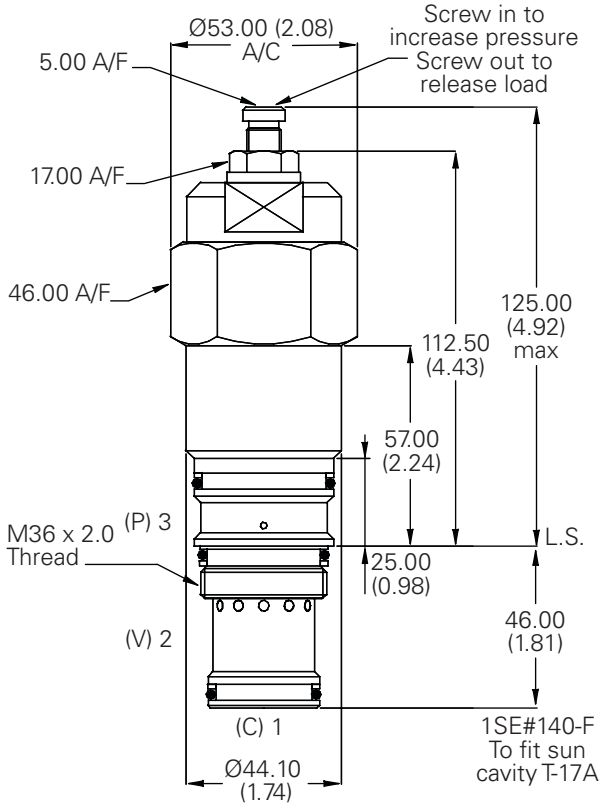
6 Counter balance setting bar

(10 bar increments).
20 to 100 bar (300 to 1500 psi)

Dimensions

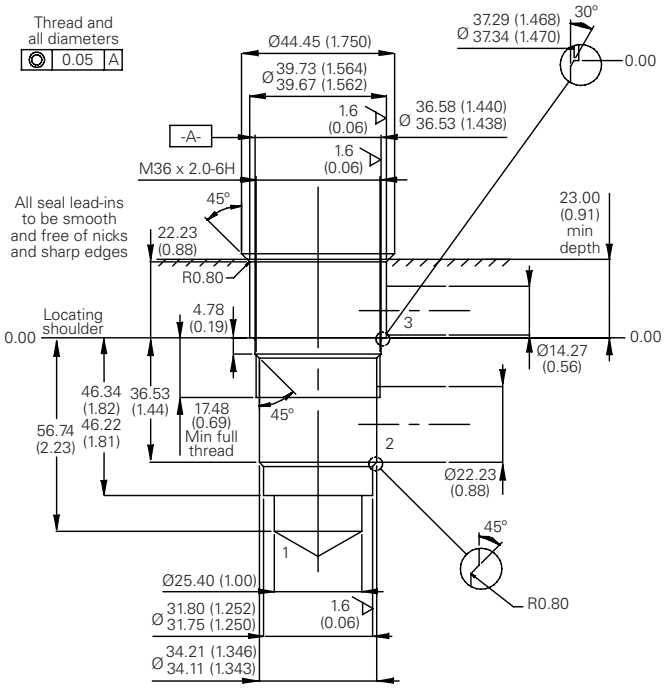
mm (inch)

Cartridge only
Basic Code
1SEL140



Cavity

Model	A20094-T17A
Form Drill	TD-17A
Form Reamer	TR17A

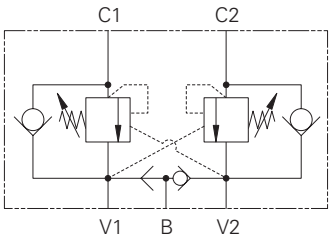


Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEESH35 - Dual overcenter valve

Pilot assisted relief with brake shuffle
30 L/min (8 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

These valves have the excellent load control and safety features of the dual overcenter valve with the addition of a port for a brake release line. Smooth, safe performance.

Pilot ratio

2.5:1 Best suited for extremely unstable applications such as long booms or flexible frameworks.

5.1 (standard) Best suited for applications where load varies and machine structure can induce instability.

10:1 Best suited for applications where the load remains relatively constant.

Description

Overcenter Valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open centre directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

These dual overcenter valves also contain a brake release shuttle valve which ensures that pressure is applied to a brake release circuit regardless of whether pressure is applied to ports V1 or V2. These multifunction valves are normally used for the static and dynamic control of systems using motors or semi-rotary actuators.

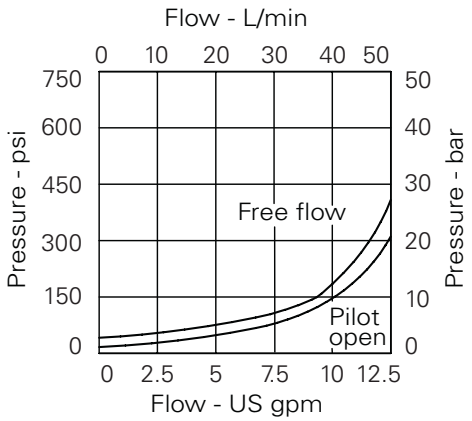
Performance data

Ratings and specifications

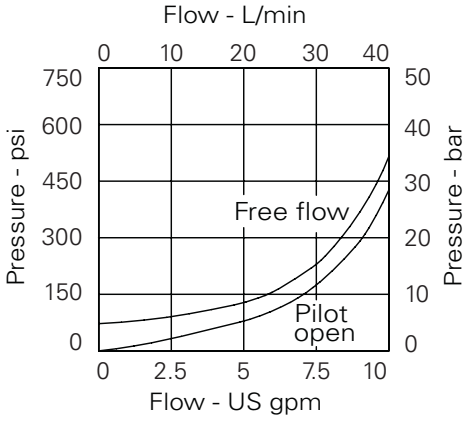
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Standard housing material	Steel
Mounting position	Line Mounted
Weight	2.20 kg (4.84 lbs)
Seal kit	SK816 (Nitrile) SK816V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



2:5:1 and 5:1 version



10:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEESH35 - Dual overcenter valve

Pilot assisted relief with brake shuffle
30 L/min (8 USgpm) • 270 bar (4000 psi)

Model code

1CEESH35	–	F	3W	–	35	S	3	–	377
1		2	3		4	5	6		7

1 Basic code

1CEESH35 - Cartridge and Body

2 Adjustment

F - Screw adjustment

N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

Code	Port size	Housing number - sub assembly
		Steel single
3W	3/4" BSP Valve & Cyl Port 1/4" BSP Brake Port	BXP15939-3W-S-377

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - (2.5:1 and 5:1) 100-350 bar. Std setting 210 bar (10:1) 120-350 bar.

Std setting made at 4.8 L/min

5 Seal material

S - Nitrile (For use with most industrial hydraulic oils)

SV - Viton (For high temperature and most special fluid applications)

6 Pilot ratio

2 - 2.5:1

5 - 5:1 (Standard)

10 - 10:1

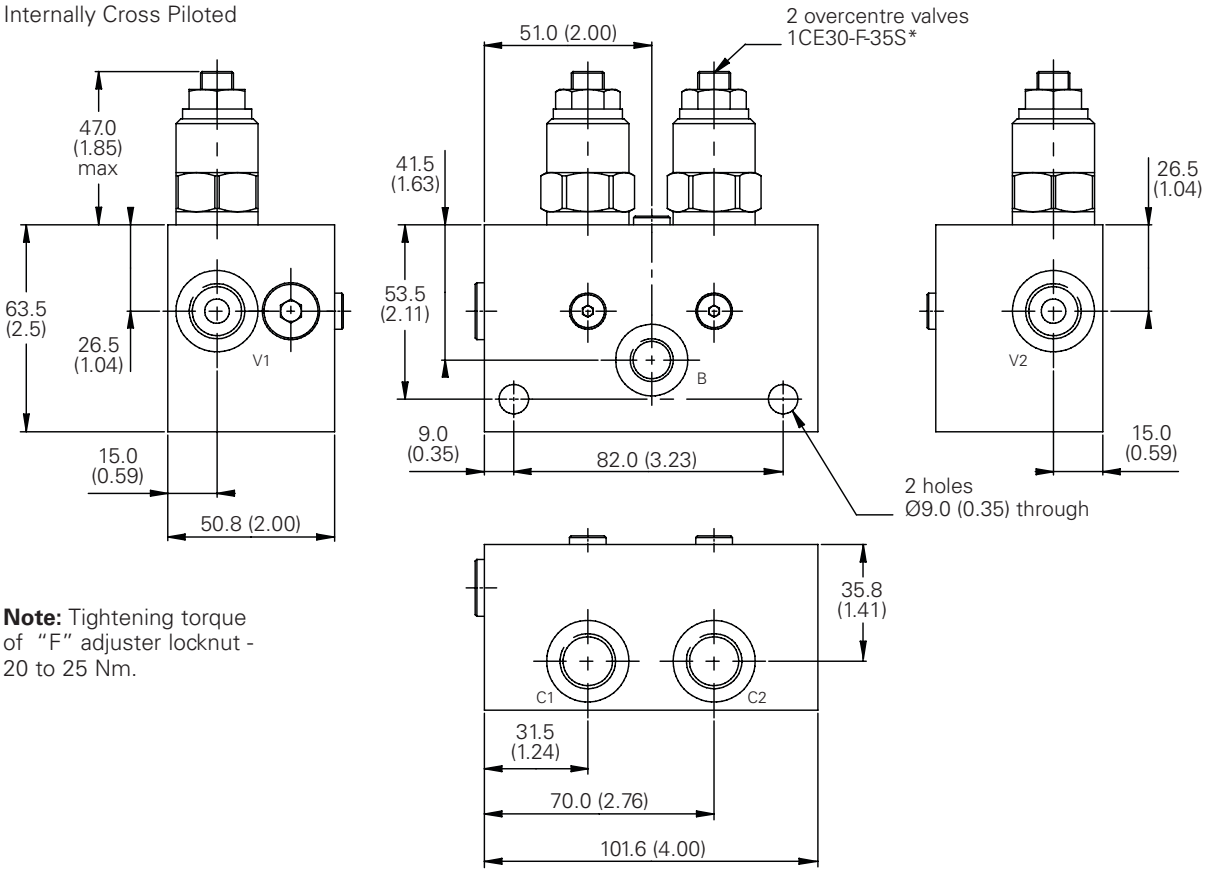
7 Body material

377 - Steel

Dimensions

mm (inch)

Complete valve
3/8" Ports
Basic Code
1CEECSH35
Internally Cross Piloted



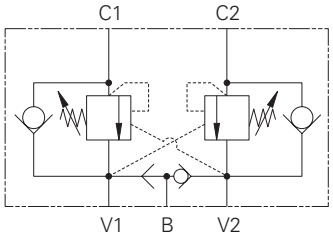
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEESH95 - Dual overcenter valve

Pilot assisted relief with brake shuffle
90 L/min (23 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

These valves have the excellent load control and safety features of the dual overcenter valve with the addition of a port for a brake release line. Smooth, safe performance.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

8.1 Best suited for applications where the load remains relatively constant.

Other ratios are available upon request.

Description

Overcenter Valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

These dual overcenter valves also contain a brake release shuttle valve which ensures that pressure is applied to a brake release circuit regardless of whether pressure is applied to ports V1 or V2. These multifunction valves are normally used for the static and dynamic control of systems using motors or semi-rotary actuators.

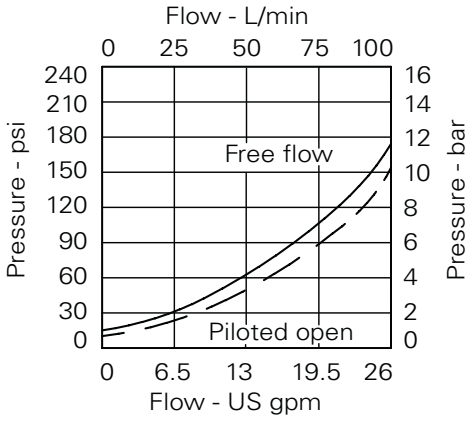
Performance data

Ratings and specifications

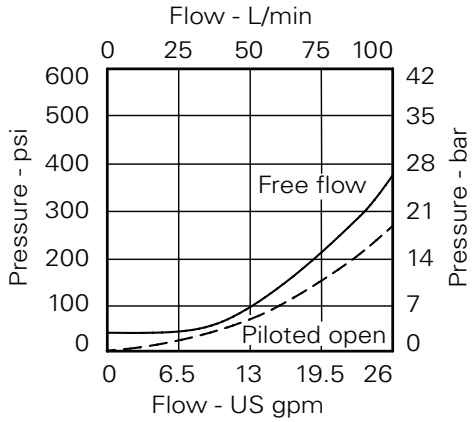
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief pressure	350 bar (5000 psi) **(35)**, 225 bar (3260 psi) **(20)**
Max load induced pressure	270 bar (4000 psi), 160 bar (2300 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Standard housing material	Steel
Mounting position	Line Mounted
Weight	2.20 kg (4.84 lbs)
Seal kit	SK817 (Nitrile) SK817V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30°C to +90°C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



4:1 version



8:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEESH95 - Dual overcenter valve

Pilot assisted relief with brake shuffle
90 L/min (23 USgpm) • 270 bar (4000 psi)

Model code

1CEESH95	–	F	6W	–	35	S	4	377
1		2	3		4	5	6	7

1 Function

1CEESH95 - Cartridge and Body

2 Adjustment means

F - Screw adjustment

N - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

Code	Port size	Housing number - body only
		Steel
6W	3/4" BSP Valve & Cyl Port 1/4" BSP Brake Port	BXP17429-6W-S-377

4 Pressure range 4.8 L/min

Note: Code based on pressure in bar.

20 - 70-225 bar. Std setting 100 bar

35 - 200-350 bar. Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils.

SV - Viton (For high temperature and most special fluid applications

6 Pilot ratio

4 - 4:1

8 - 8:1

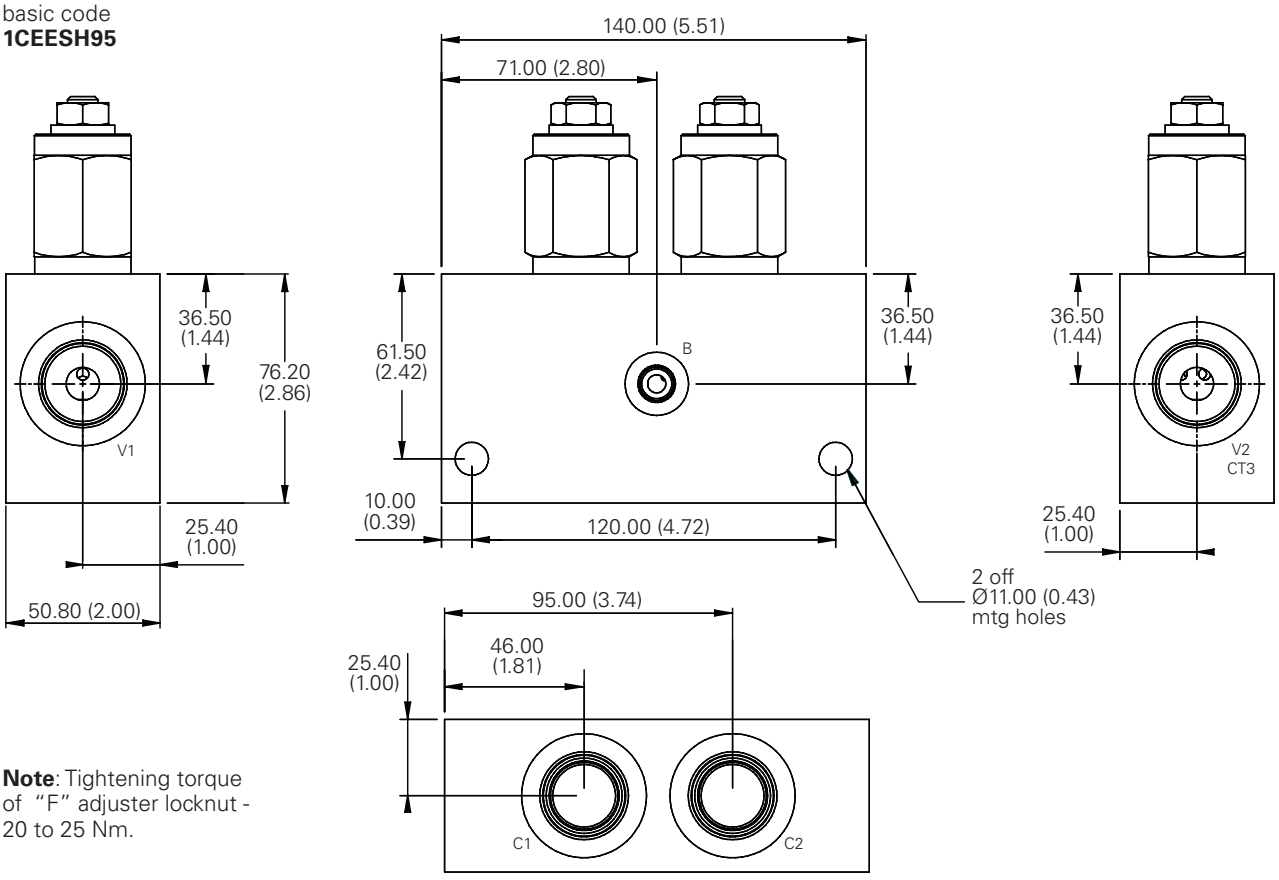
7 Body material

377 - Steel

Dimensions

mm (inch)

Complete valve
3/4" Ports
basic code
1CEESH95



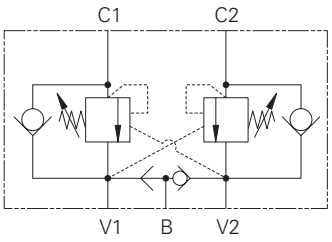
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEESH150 - Dual overcenter valve

Pilot assisted relief with brake shuttle
150 L/min (40 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

These valves have the excellent load control and safety features of the dual overcenter valve with the addition of a port for a brake release line. Smooth, safe performance.

Pilot ratio

3.5:1 Best suited for applications where load varies and machine structure can induce instability.

Description

Overcenter Valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

These dual overcenter valves also contain a brake release shuttle valve which ensures that pressure is applied to a brake release circuit regardless of whether pressure is applied to ports V1 or V2. These multifunction valves are normally used for the static and dynamic control of systems using motors or semi-rotary actuators.

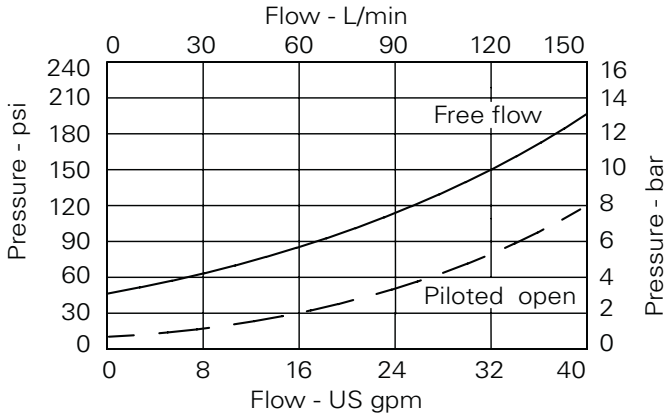
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	150 L/min (40 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Standard housing material	Steel
Mounting position	Line Mounted
Weight	3.50 kg (7.70 lbs)
Seal kit	SK818 (Nitrile) SK818V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEESH150 - Dual overcenter valve

Pilot assisted relief with brake shuttle
150 L/min (40 USgpm) • 270 bar (4000 psi)

Model code

1CEESH150 – F 8W – 35 S 3 377

1 2 3 4 5 6 7

1 Function

1CEESH150 - Cartridges and Body

2 Adjustment means

F - Screw adjustment

3 Port size

Code	Port size	Housing number - body only
		Steel
8W	1" BSP Valve & Cyl Port 1/4" BSP Pilot Port	CXP15933-8W-377

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - 70-350 bar.
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seal material

S - Nitrile (For use with most industrial hydraulic oils.

SV - Viton (For high temperature and most special fluid applications

6 Pilot ratio

3 - 3.5:1

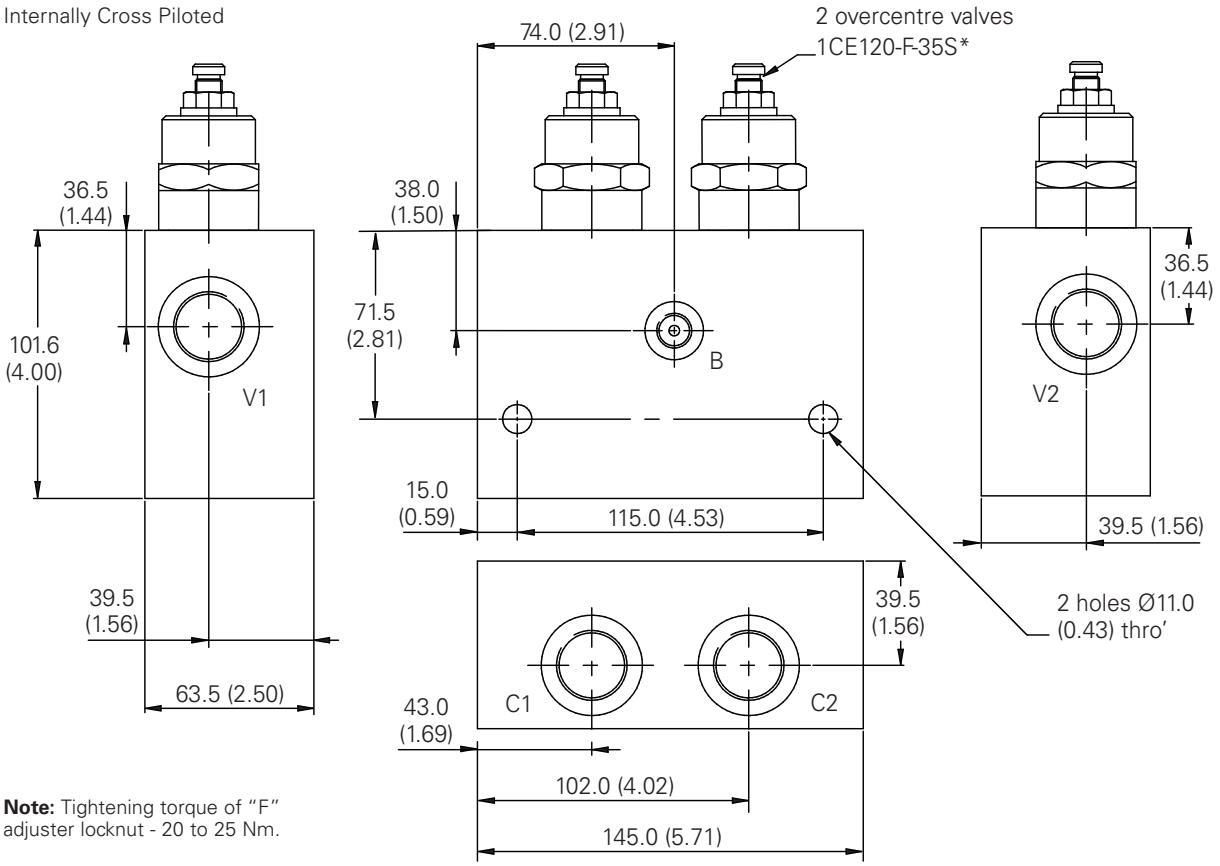
7 Body material

377 - Steel

Dimensions

mm (inch)

Complete valve
1" Ports
Basic Code
1CEESH150
Internally Cross Piloted



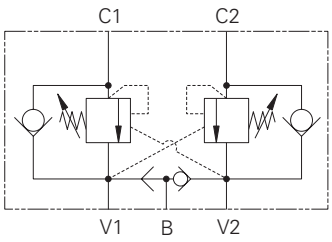
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEESH350 - Dual overcenter valve

Pilot assisted relief with brake shuttle
300 L/min (80 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

These valves have the excellent load control and safety features of the dual overcenter valve with the addition of a port for a brake release line. Smooth, safe performance.

Pilot ratio

3:1 Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

Description

Overcenter Valves give static and dynamic control of loads by regulating the flow into and out of hydraulic actuators. When installed close to or within an actuator, the overcenter valve will stop runaway in the event of hose burst and if open center directional control valves are used, will allow thermal expansion relief of the hydraulic fluid.

These dual overcenter valves also contain a brake release shuttle valve which ensures that pressure is applied to a brake release circuit regardless of whether pressure is applied to ports V1 or V2. These multifunction valves are normally used for the static and dynamic control of systems using motors or semi-rotary actuators.

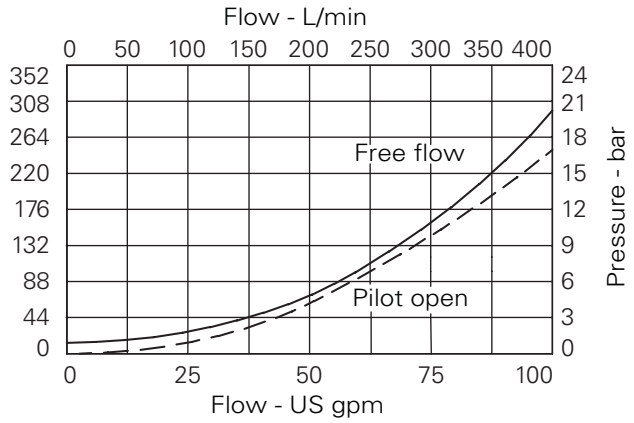
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	300 L/min (80 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Standard housing material	Steel
Mounting position	Line mounted
Weight	5.42 kg (11.94 lbs)
Seal kit	SK688 (Nitrile) SK688V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30°C to +90°C (-22° to +194°F)
Internal leakage	4 milliliters/min nominal (60 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEESH350 - Dual overcenter valve

Pilot assisted relief with brake shuttle
300 L/min (80 USgpm) • 270 bar (4000 psi)

Model code

1CEESH350 – F 10W – 35 S 3 377

1 2 3 4 5 6 7

1 Basic code

1CEESH350 - Cartridges and Body

2 Adjustment means

F - Screw adjustment

3 Port size

Code	Port size	Housing number - body only
		Steel
10W	1 1/4" BSP Valve & Cyl Port 1/4" BSP Pilot Port	CXP22297-10W-S-377

4 Pressure range @4.8 L/min

Note: Code based on pressure in bar.

35 - 70-350 bar.
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils.

SV - Viton (For high temperature and most special fluid applications

6 Pilot ratio

3 - 3:1
8 - 8:1

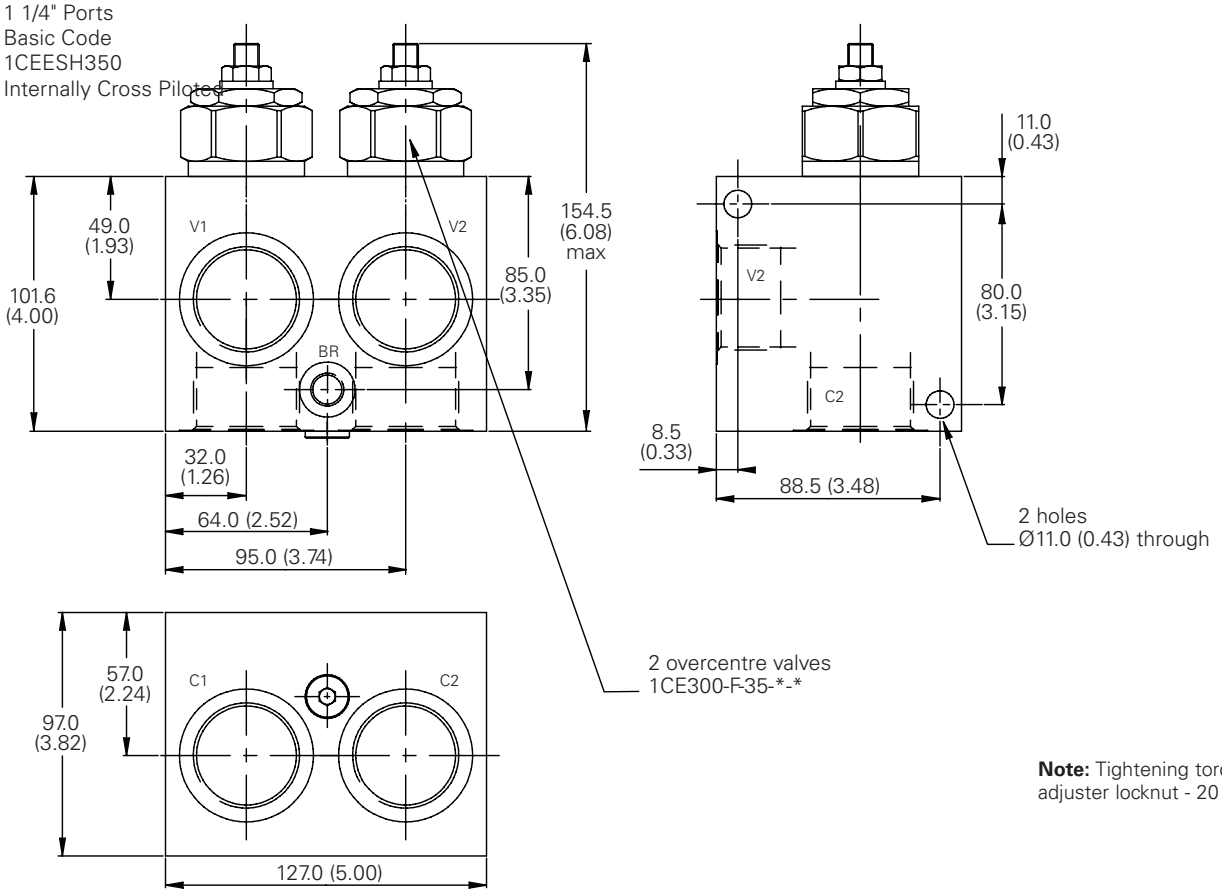
7 Body material

377 - Steel

Dimensions

mm (inch)

Complete valve
1 1/4" Ports
Basic Code
1CEESH350
Internally Cross Piloted



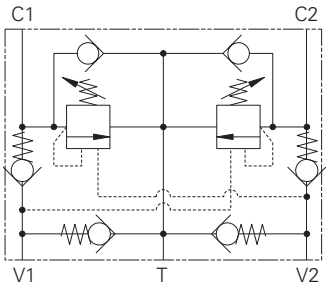
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

F

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEEC35 - Motion control and lock valve

Pilot assisted relief
30 L/min (8 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

A system of check valves allows crossline relief for dynamic applications with the optional make up facility to compensate for any change in system volume.

Features

These valves provide complete circuit control and protection in a single valve body, reducing installation time and cost. Smooth, safe performance of dual direction actuators.

Pilot ratio

2.5:1 Best suited for extremely unstable applications such as long booms or flexible frameworks.

5:1 (standard) Best suited for applications where the load varies and machine structure can induce instability.

10:1 Best suited for applications where the load remains relatively constant.

Description

Motion control and lock valves give static and dynamic control by regulating the flow into and out of hydraulic actuators. When installed close to an actuator, the valve can stop runaway in the event of hose burst. The valves also give dual thermal and overload relief protection.

A low pressure tank or charge line may be connected to the T port to provide a make-up flow to either actuator port.

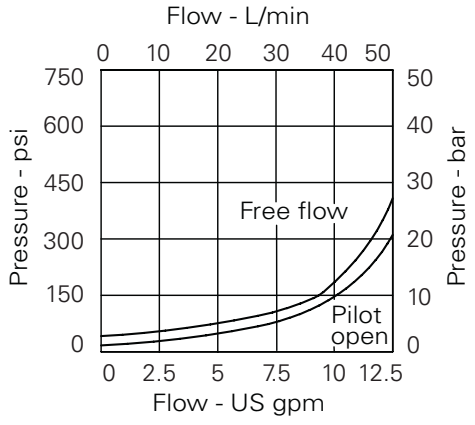
Performance data

Ratings and specifications

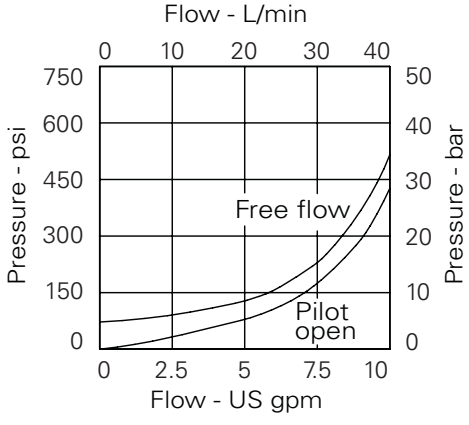
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief pressure	350 bar (5000 psi) **(35)**, 225 bar (3260 psi) **(20)**
Max load induced pressure	270 bar (4000 psi) **(35)**, 160 bar (2300 psi) **(20)**
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Standard housing material	Steel
Mounting position	Line mounted
Weight	2.03 kg (4.50 lbs)
Seal kit	SK815 (Nitrile) SK815V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



2:5:1 and 5:1 version



10:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code

1CEEC35	–	F	3W	–	35	S	5	377
1		2	3		4	5	6	7

1 Basic code

1CEEC35 - Cartridge and Body

2 Adjustment means

F - Screw adjustment
N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size - bodied valves only

Code	Port size	Housing number
		Steel
3W	**3/8"** BSP	BXP16247-3W-S-377

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

20	-	(2.5:1 and 5:1)	70-210 bar	Std setting 100 bar
		(10:1)	100-210 bar	Std setting 100 bar
35	-	(2.5:1 and 5:1)	100-350 bar	Std setting 210 bar
		(10:1)	120-350 bar	Std setting 210 bar

Std setting made a 4.8 L/min made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils.

SV - Viton (For high temperature and most special fluid applications

6 Pilot ratio

2 - 2.5:1
5 - 5:1
10 - 10:1

Other ratios available upon request

7 Body material

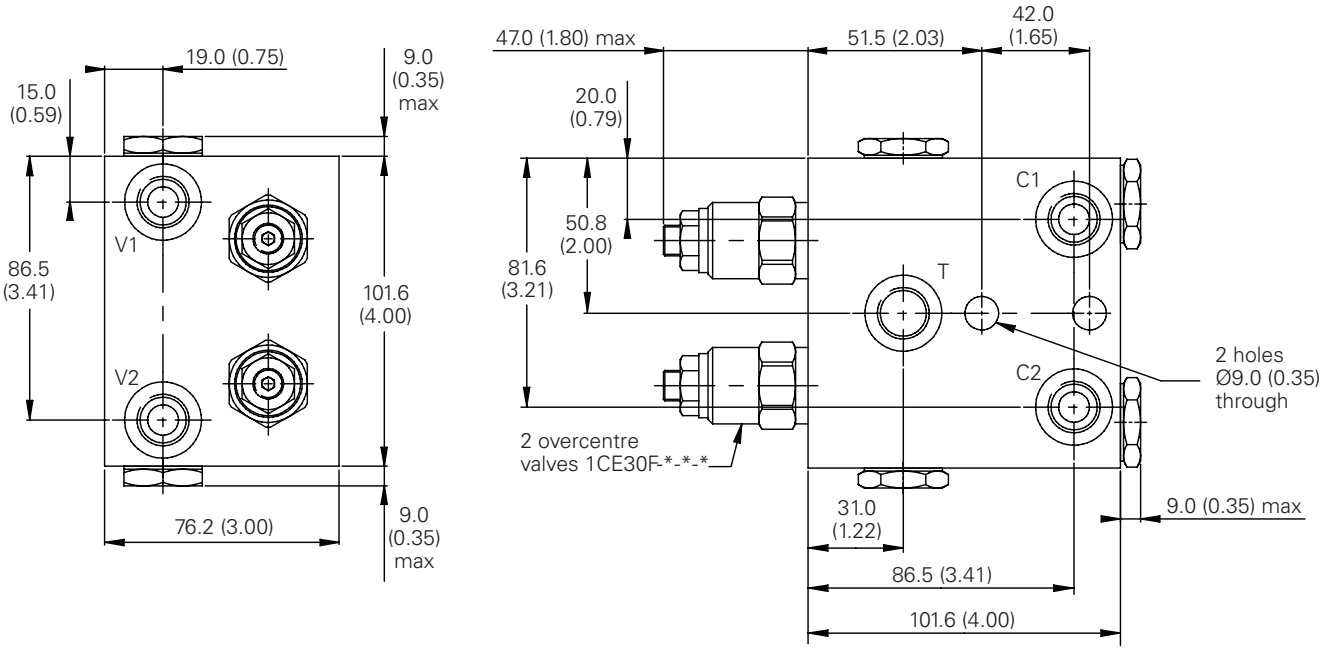
377 - Steel

F

Dimensions

mm (inch)

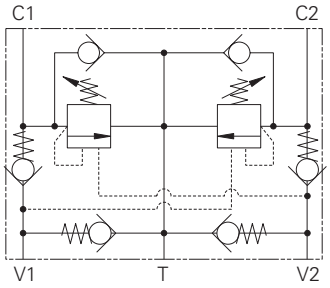
Complete valve
3/8" Ports Ports
Basic Code
1CEEC35



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

1CEEC95 - Motion control & lock valve

Pilot assisted relief
95 L/min (25 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follow

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

A system of check valves allows crossline relief for dynamic applications with the optional make up facility to compensate for any change in system volume.

Features

These valves provide complete circuit control and protection in a single valve body, reducing installation time and cost. Smooth, safe performance of dual direction actuators.

Pilot ratio

4:1 Best suited for applications where the load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

Description

Motion control and lock valves give static and dynamic control by regulating the flow into and out of hydraulic actuators. When installed close to an actuator, the valve can stop runaway in the event of hose burst. The valves also give dual thermal and overload relief protection.

A low pressure tank or charge line may be connected to the T port to provide a make-up flow to either actuator port.

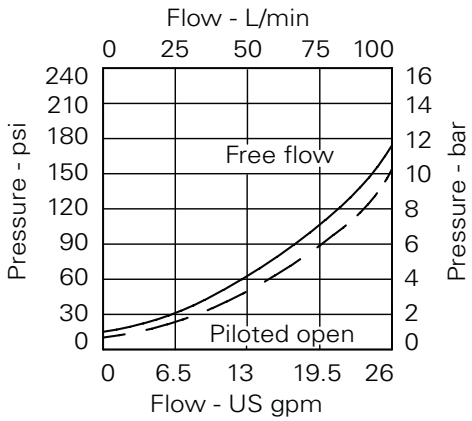
Performance data

Ratings and specifications

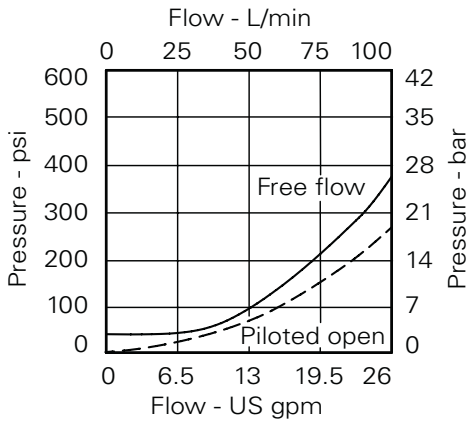
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	1CEEC95 95 L/min (25 USgpm)
Max relief pressure	350 bar (5000 psi) **(35)**, 225 bar (3260 psi) **(20)**
Max load induced pressure	270 bar (4000 psi) **(35)**, 160 bar (2300 psi) **(20)**
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Standard housing material	Steel
Mounting position	Line mounted
Weight	3.70 kg (8.20 lbs)
Seal kit	SK814 (Nitrile) SK814V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 milliliters/min nominal (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



4:1 version



8:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEEC95 - Motion control & lock valve

Pilot assisted relief
95 L/min (25 USgpm) • 270 bar (4000 psi)

Model code

1CEEC95	–	F	3W	–	35	S	5	377
1		2	3		4	5	6	7

1 Basic code

1CEEC95 - Cartridge and Body

2 Adjustment means

F - Screw adjustment
N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

Code	Port size	Housing number- body only
		Steel
6W	**3/4"** BSP	BXP16248-6W-S-377

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - (4:1 and 8:1)
200-350 bar
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils.
SV - Viton (For high temperature and most special fluid applications made at 4.8 L/min

6 Pilot ratio

4 - 4:1
8 - 8:1

Other ratios available upon request

7 Body material

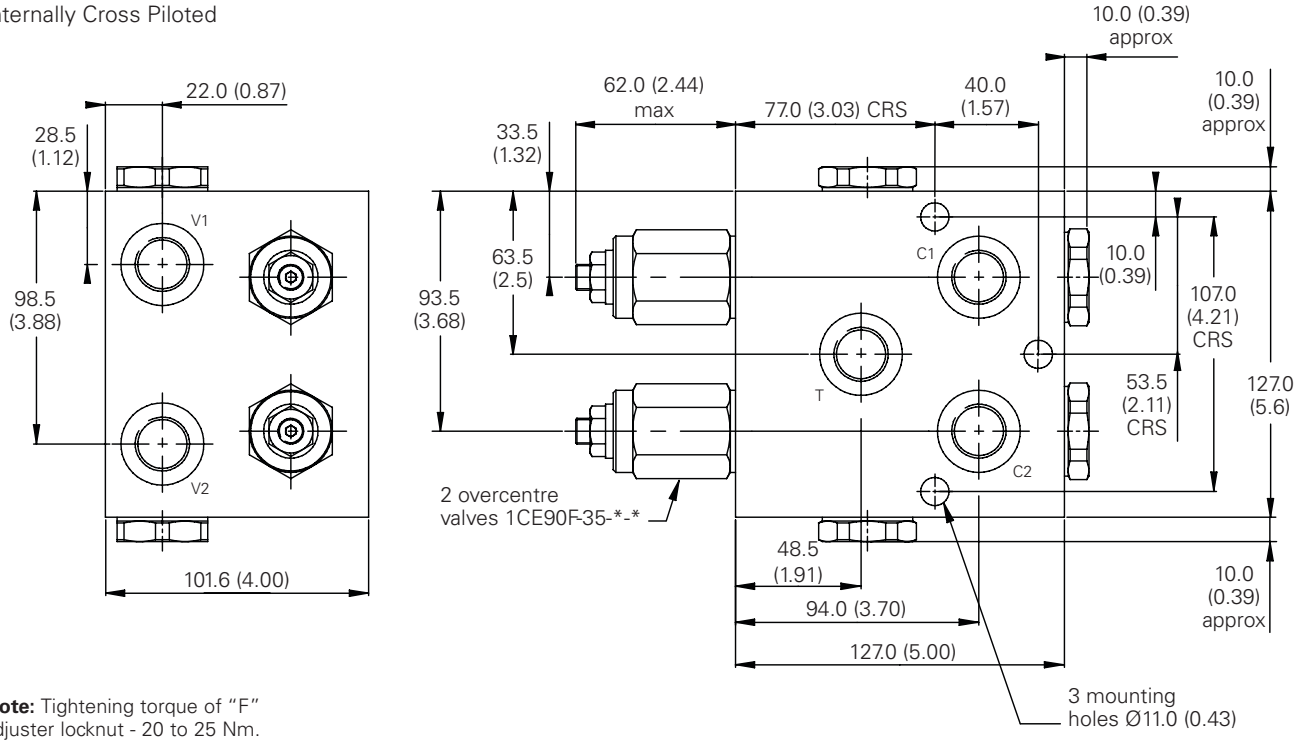
377 - Steel

F

Dimensions

mm (inch)

Complete valve
3/4" Ports
Basic Code
1CEEC95
Internally Cross Piloted

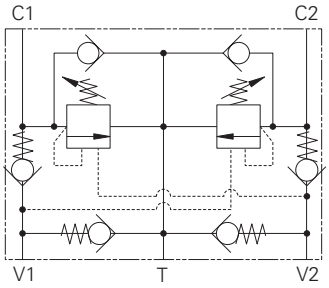


Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEEC150 - Motion control & lock valve

Pilot assisted relief
150 L/min (40 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

A system of check valves allows crossline relief for dynamic applications with the optional make up facility to compensate for any change in system volume.

Features

These valves provide complete circuit control and protection in a single valve body, reducing installation time and cost. Smooth, safe performance of dual direction actuators.

Pilot ratio

3.5:1 Best suited for applications where the load varies and machine structure can induce instability.

Description

Motion control and lock valves give static and dynamic control by regulating the flow into and out of hydraulic actuators. When installed close to an actuator, the valve can stop runaway in the event of hose burst. The valves also give dual thermal and overload relief protection.

A low pressure tank or charge line may be connected to the T port to provide a make-up flow to either actuator port.

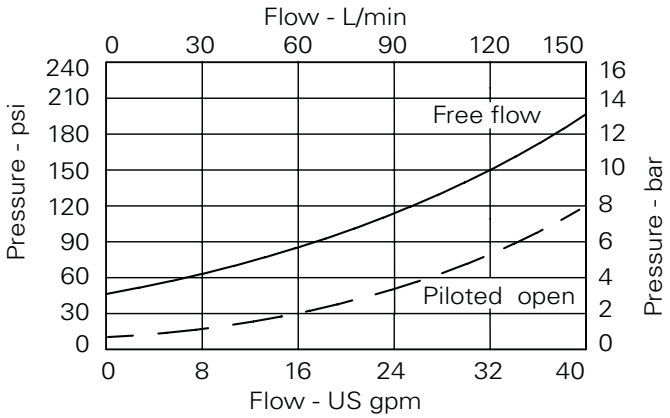
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	150 L/min (40 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Steel
Mounting position	Line mounted
Weight	3.7 kg (8.2 lbs)
Seal kit	SK813 (Nitrile) SK813V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 ml/min (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEEC150 - Motion control & lock valve

Pilot assisted relief
150 L/min (40 USgpm) • 270 bar (4000 psi)

Model code

1CEEC150 – F 8W – 35 S 3 377

1 2 3 4 5 6 7

1 Basic code

1CEEC150 - Cartridges and body

2 Adjustment means

F - Screw adjustment

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

Code	Port size	Housing number- body only
		Steel
8W	1" BSP Valve & Cyl Port. 1/4" BSP Brake Port	BXP15687-8W-S-377

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - 70-35 bar
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seal material

S - Nitrile (For use with most industrial hydraulic oils.

SV - Viton (For high temperature and most special fluid applications made at 4.8 L/min

6 Pilot ratio

3 - 3.5:1

7 Body material

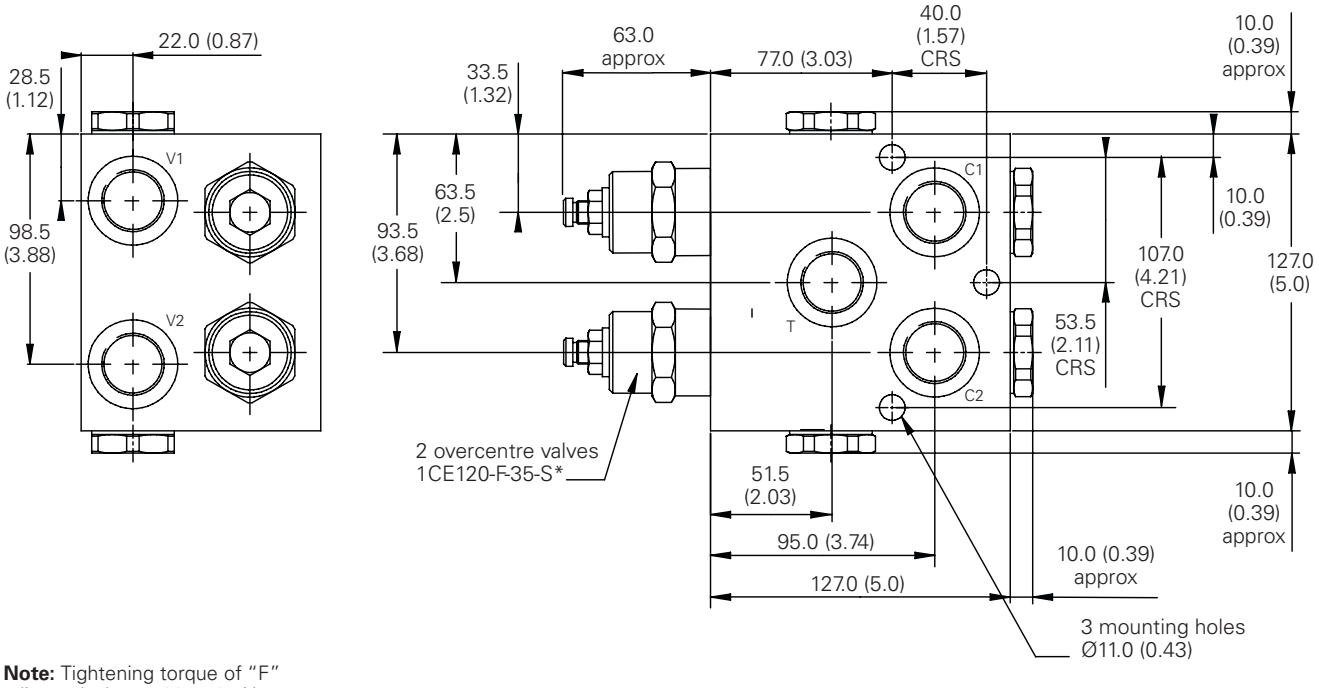
377 - Steel

F

Dimensions

mm (inch)

Complete valve
1" Ports
Basic Code
1CEEC150

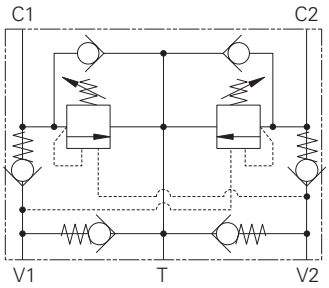


Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEEC350 - Motion control & lock valve

Pilot assisted relief
300 L/min (80 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

A system of check valves allows crossline relief for dynamic applications with the optional make up facility to compensate for any change in system volume.

Features

These valves provide complete circuit control and protection in a single valve body, reducing installation time and cost. Smooth, safe performance of dual direction actuators.

Pilot ratio

3:1 Best suited for applications where the load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

Description

Motion control and lock valves give static and dynamic control by regulating the flow into and out of hydraulic actuators. When installed close to an actuator, the valve can stop runaway in the event of hose burst. The valves also give dual thermal and overload relief protection.

A low pressure tank or charge line may be connected to the T port to provide a make-up flow to either actuator port.

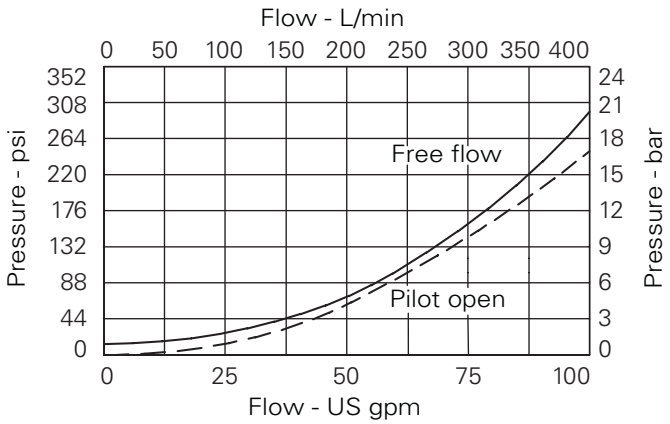
Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	300 L/min (80 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces zinc plated.
Standard housing materials	Steel
Mounting position	Line mounted
Weight	8.2 kg (18.0 lbs)
Seal kit	SK635 (Nitrile) SK635V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	4 ml/min (60 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEEC350 - Motion control & lock valve

Pilot assisted relief
300 L/min (80 USgpm) • 270 bar (4000 psi)

Model code

1CEEC350 – F 10W – 35 S 3 377

1 2 3 4 5 6 7

1 Basic code

1CEEC350 - Cartridges and body

2 Adjustment means

F - Screw adjustment

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port sizes - bodied valves only

Code	Port size	Housing number
		Steel Single
10W	1 1/4" BSP valve & cyl port. 1/4" BSP brake port	DXP16844-10W-S-377

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - 70-35 bar
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils.

SV - Viton (For high temperature and most special fluid applications made at 4.8 L/min

6 Pilot ratio

3 - 3:1
8 - 8:1

7 Housing material

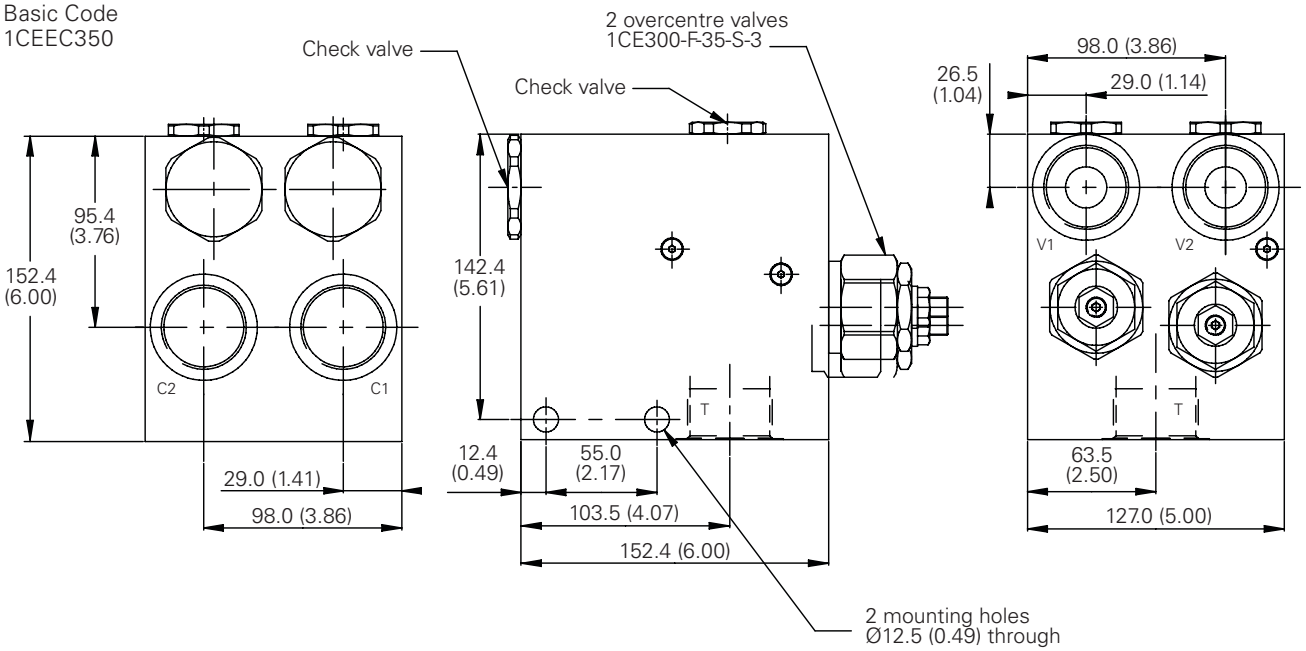
377 - Steel

F

Dimensions

mm (inch)

Complete valve
1 1/4" Ports
Basic Code
1CEEC350

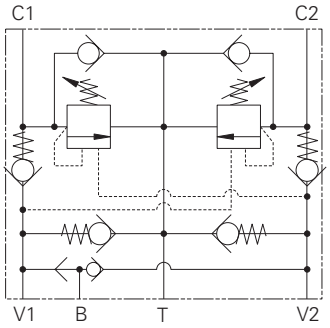


Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEECSH35 - Motion control & lock valve

Pilot assisted relief with brake shuttle
30 L/min (8 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

A system of check valves allows crossline relief for dynamic applications with the optional make up facility to compensate for any change in system volume.

Feature

This valve provides complete circuit control and protection as with the standard motion control valve but has the addition of a brake release shuttle and brake port contained in a single body.

Pilot ratio

2.5:1 Best suited for extremely unstable applications such as long booms or flexible frameworks.

5:1 (standard) Best suited for applications where load varies and machine structure can induce instability.

10:1 Best suited for applications where the load remains relatively constant.

Description

Motion control and lock valves give static and dynamic control by regulating the flow into and out of hydraulic actuators. When installed close to an actuator, the valve can stop runaway in the event of hose burst. The valves also give dual thermal and overload relief protection.

A low pressure tank or charge line may be connected to the T port to provide a make-up flow to either actuator port.

The shuttle valve provides a signal from the high pressure side of the actuator to release sprung applied brakes.

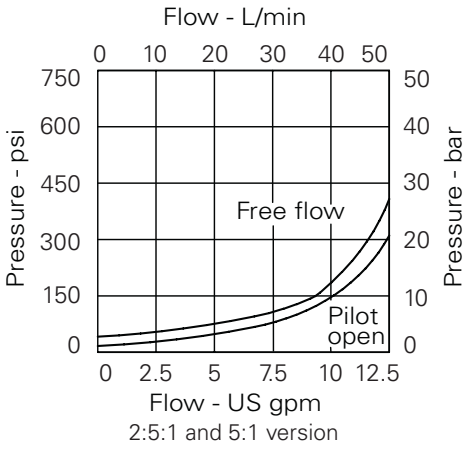
Performance data

Ratings and specifications

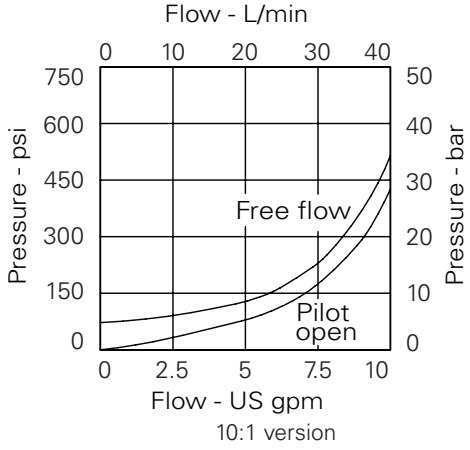
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Standard housing materials	Steel
Mounting position	Line mounted
Weight	2.03 kg (4.5 lbs)
Seal kit	SK815 (Nitrile) SK815V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 ml/min (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



2:5:1 and 5:1 version



10:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEECSH35 - Motion control & lock valve

Pilot assisted relief with brake shuttle
30 L/min (8 USgpm) • 270 bar (4000 psi)

Model code

1CEECSH35 – F 3W – 35 S 5 377

1 2 3 4 5 6 7

1 Function

1CEECSH35 - Cartridges and body

2 Adjustment means

F - Screw adjustment
N - Fixed - State pressure setting required

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port sizes - bodied valves only

Code	Port size	Housing number - sub assembly
		Steel
3W	3/8" BSP Valve & Cyl Port. 1/4" BSP Brake Port	CXP15947-3W-S-377

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.
35 - (2.5:1 and 5:1) 100-350 bar Std setting 210 bar (10:1) 120-350 bar Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils.
SV - Viton (For high temperature and most special fluid applications made at 4.8 L/min

6 Pilot ratios

2 - 2.5:1
5 - 5:1 (Standard)
10 - 10:1

7 Body material

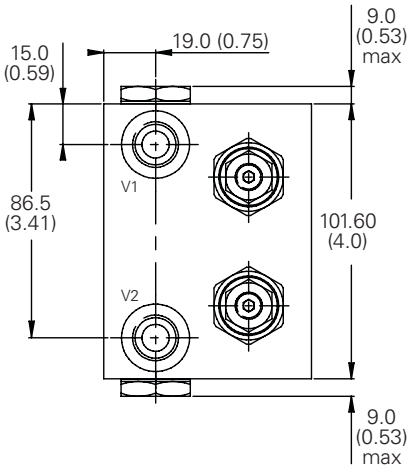
377 - Steel

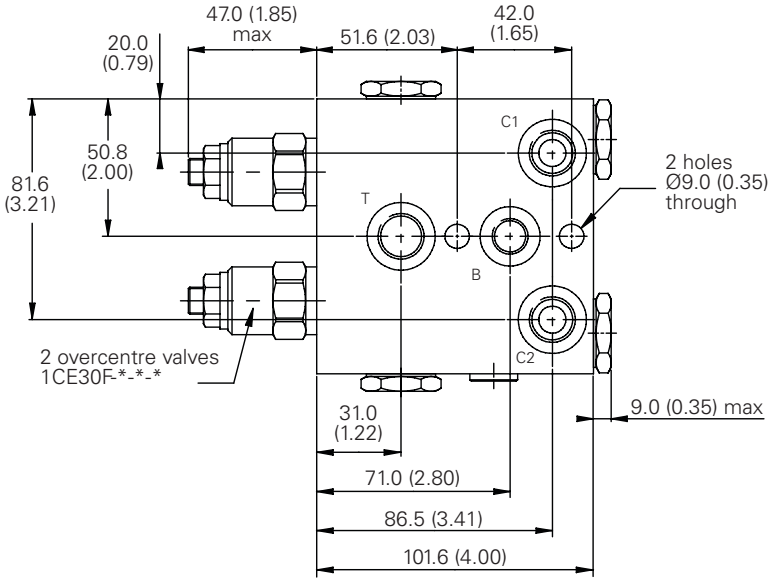
F

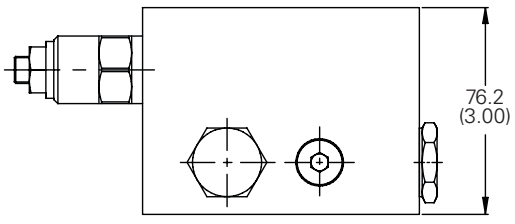
Dimensions

mm (inch)

Complete valve
3/8" Ports
Basic Code
1CEECSH35
Internally Cross Piloted





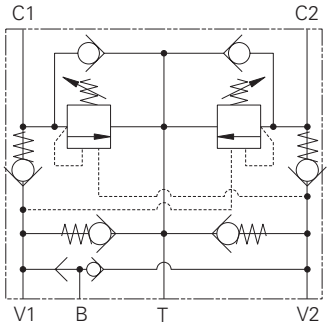


Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEECSH95 - Motion control & lock valve

Pilot assisted relief with brake shuttle
95 L/min (25 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

A system of check valves allows crossline relief for dynamic applications with the optional make up facility to compensate for any change in system volume.

Features

This valve provides complete circuit control and protection as with the standard motion control valve but has the addition of a brake release shuttle and brake port contained in a single body.

Pilot ratio

4:1 Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

Description

Motion control and lock valves give static and dynamic control by regulating the flow into and out of hydraulic actuators. When installed close to an actuator, the valve can stop runaway in the event of hose burst. The valves also give dual thermal and overload relief protection.

A low pressure tank or charge line may be connected to the T port to provide a make-up flow to either actuator port.

The shuttle valve provides a signal from the high pressure side of the actuator to release sprung applied brakes.

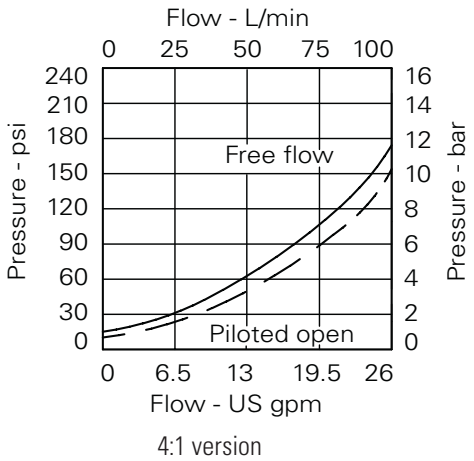
Performance data

Ratings and specifications

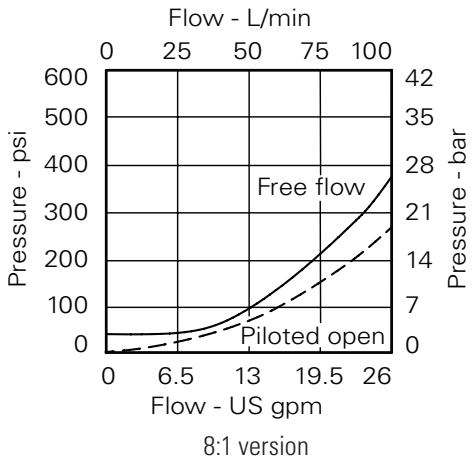
Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	95 L/min (25 USgpm)
Max relief pressure	350 bar (5000 psi) **(35)**, 225 bar (3260 psi) **(20)**
Max load induced pressure	270 bar (4000 psi) **(35)**,160 bar (2300 psi) **(20)**
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Standard housing materials	Steel
Mounting position	Line mounted
Weight	3.70 kg (8.20 lbs)
Seal kit	SK814 (Nitrile) SK814V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to 90°C(-22° to +194°F)
Internal leakage	0.3 ml/min (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



4:1 version



8:1 version

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEECSH95 - Motion control & lock valve

Pilot assisted relief with brake shuttle
95 L/min (25 USgpm) • 270 bar (4000 psi)

Model code

1CEECSH95 – F 6W – 35 S 4 377

1 2 3 4 5 6 7

1 Basic code

1CEECSH95 - Cartridges and body

2 Adjustment means

F - Screw adjustment
N - Fixed - state pressure setting required.

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

Code	Port size	Housing number - body only
		Steel
6W	3/4" BSP Valve & Cyl Port. 1/4" BSP Brake Port	BXP15936-6W-S-377

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.
20 - 70-225 bar
Std setting 100 bar.
35 - 200-350 bar
Std setting 210 bar.

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils.
SV - Viton (For high temperature and most special fluid applications made at 4.8 L/min

6 Pilot ratio

4 - 4:1 (Standard)
8 - 8:1

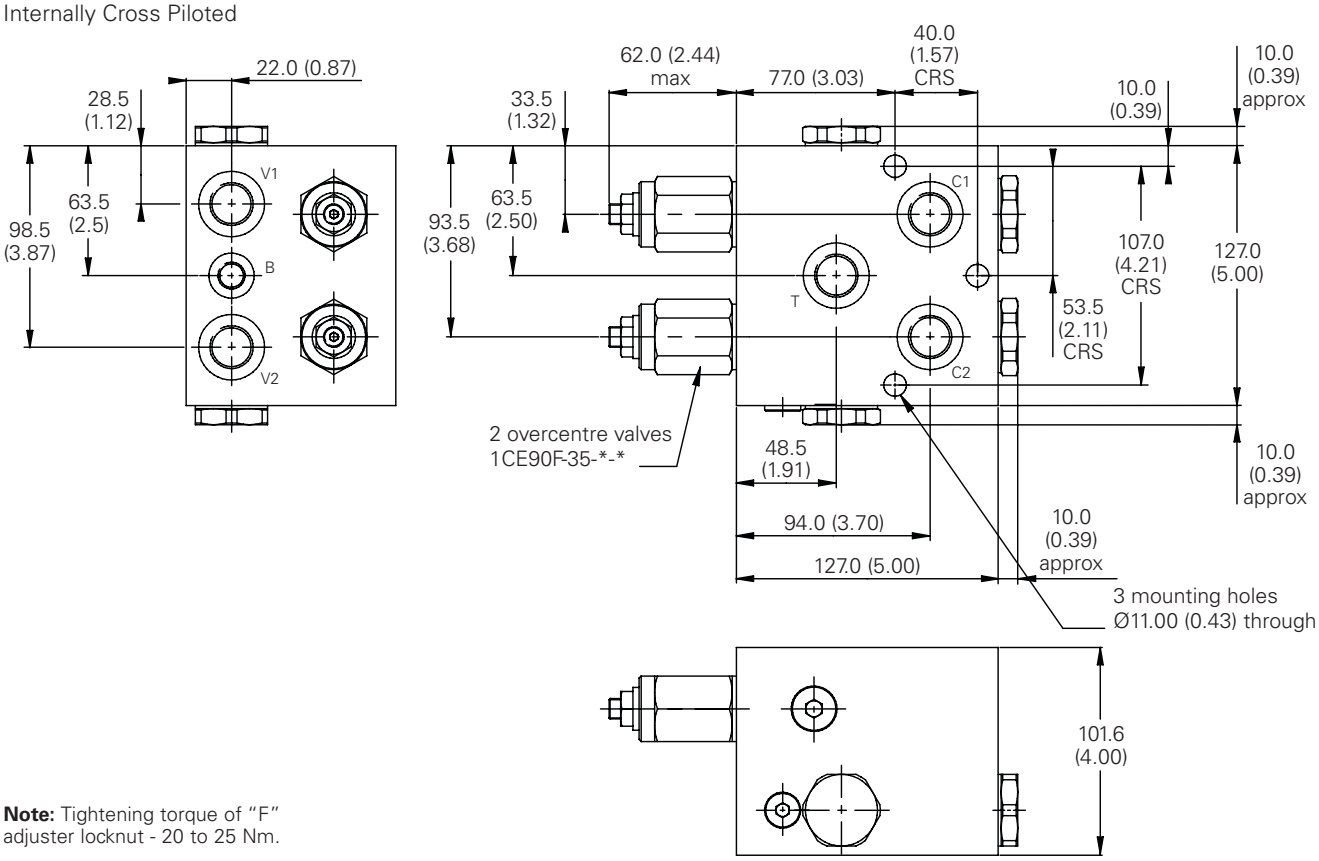
7 Body material

377 - Steel

Dimensions

mm (inch)

Complete valve
3/4" Ports
Basic Code
1CEECSH95
Internally Cross Piloted



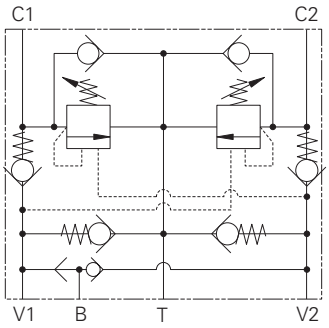
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEECSH150 - Motion control & lock valve

Pilot assisted relief with brake shuttle
150 L/min (40 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

A system of check valves allows crossline relief for dynamic applications with the optional make up facility to compensate for any change in system volume.

Features

This valve provides complete circuit control and protection as with the standard motion control valve but has the addition of a brake release shuttle and brake port contained in a single body.

Pilot ratio

3.5:1 Best suited for applications where load varies and machine structure can induce instability.

Description

Motion control and lock valves give static and dynamic control by regulating the flow into and out of hydraulic actuators. When installed close to an actuator, the valve can stop runaway in the event of hose burst. The valves also give dual thermal and overload relief protection.

A low pressure tank or charge line may be connected to the T port to provide a make-up flow to either actuator port.

The shuttle valve provides a signal from the high pressure side of the actuator to release sprung applied brakes.

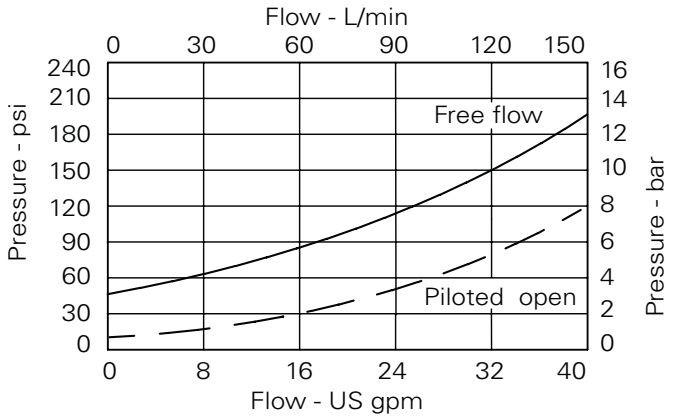
Performance data

Ratings and specifications

Performance data is typical with fluid at 32 cST (150 SUS)	
Rated flow	150 L/min (40 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel External surfaces electroless nickel plated
Standard housing materials	Steel
Mounting position	Line mounted
Weight	3.7 kg (8.2 lbs)
Seal kit	SK813 (Nitrile) SK813V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.3 ml/min (5 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEECSH150 - Motion control & lock valve

Pilot assisted relief with brake shuttle
150 L/min (40 USgpm) • 270 bar (4000 psi)

Model code

1CEECSH150 – F 8W – 35 S 3 377

1 2 3 4 5 6 7

1 Basic code

1CEECSH150 - Cartridges and body

2 Adjustment means

F - Screw adjustment

3 Port size

Code	Port size	Housing number - body only
		Steel
8W	1" BSP valve & cyl port. 1/4" BSP brake port	BXP15930-8W-S-377

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - 70-35 bar
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils.

SV - Viton (For high temperature and most special fluid applications made at 4.8 L/min

6 Pilot ratio

3 - 3.5:1

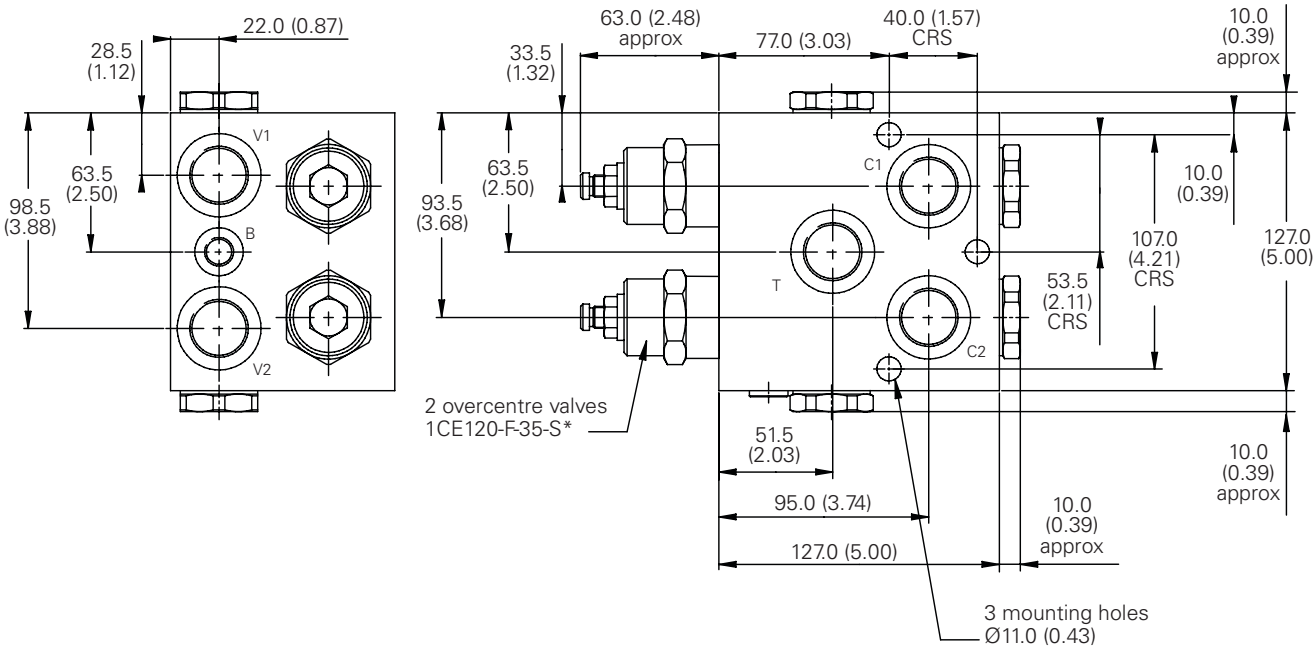
7 Body material

377 - Steel

Dimensions

mm (inch)

Complete valve
1 Port
Basic Code
1CEECSH150
Internally Cross Piloted



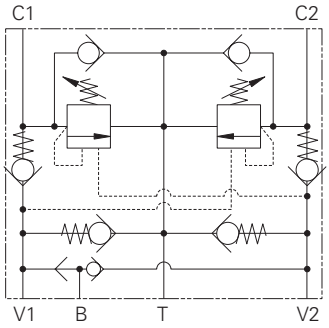
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEECSH350 - Motion control & lock valve

Pilot assisted relief with brake shuttle
350 L/min (80 USgpm) • 270 bar (4000 psi)



Operation

The check section allows free flow into the actuator then holds and locks the load against movement. The pilot assisted relief valve section will give controlled movement when pilot pressure is applied. The relief section is normally set to open at a pressure at least 1.3 times the maximum load induced pressure but the pressure required to open the valve and allow movement depends on the pilot ratio of the valve. For optimization of load control and energy usage, a choice of pilot ratios is available.

The pressure required to open the valve and start actuator movement can be calculated as ollows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

A system of check valves allows crossline relief for dynamic applications with the optional make up facility to compensate for any change in system volume.

Features

This valve provides complete circuit control and protection as with the standard motion control valve but has the addition of a brake release shuttle and brake port contained in a single body.

Pilot ratio

3:1 (standard) Best suited for applications where load varies and machine structure can induce instability.

8:1 Best suited for applications where the load remains relatively constant.

F

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	350 L/min (80 USgpm)
Max relief pressure	350 bar (5000 psi)
Max load induced pressure	270 bar (4000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated.
Standard housing materials	Steel
Mounting position	Line mounted
Weight	8.2 kg (18.0 lbs)
Seal kit	SK635 (Nitrile) SK635V (Viton®)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	4 ml/min (60 dpm)
Nominal viscosity range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont.

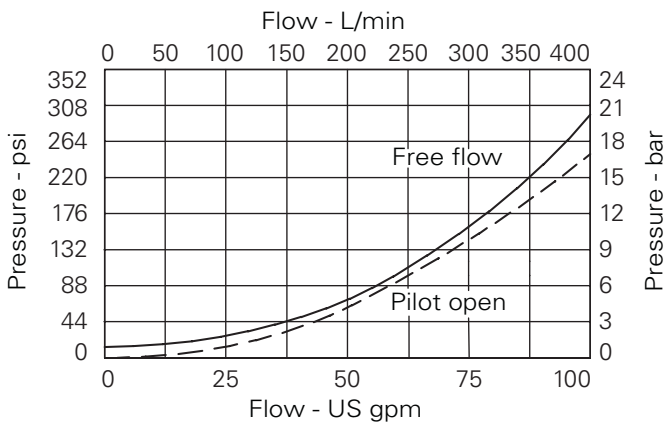
Description

Motion control and lock valves give static and dynamic control by regulating the flow into and out of hydraulic actuators. When installed close to an actuator, the valve can stop runaway in the event of hose burst. The valves also give dual thermal and overload relief protection.

A low pressure tank or charge line may be connected to the T port to provide a make-up flow to either actuator port.

The shuttle valve provides a signal from the high pressure side of the actuator to release sprung applied brakes.

Pressure drop



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEECSH350 - Motion control & lock valve

Pilot assisted relief with brake shuttle
350 L/min (80 USgpm) • 270 bar (4000 psi)

Model code

1CEECSH350 – F 10W – 35 S 3 377

1 2 3 4 5 6 7

1 Basic code

1CEECSH350 - Cartridges and body

2 Adjustment means

F - Screw adjustment

3 Port size

Code	Port size	Housing number - body only
		Steel
10W	1 1/4" BSP valve & cyl port. 1/4" BSP brake port	DXP22047-10W-S-377

4 Pressure range

Note: Code based on pressure in bar.
35 - 70-350 bar
Std setting 210 bar

Std setting made at 4.8 L/min

5 Seals

S - Nitrile (For use with most industrial hydraulic oils.
SV - Viton (For high temperature and most special fluid applications made at 4.8 L/min

6 Pilot ratio

3 - 3:1 Standard
8 - 8:1

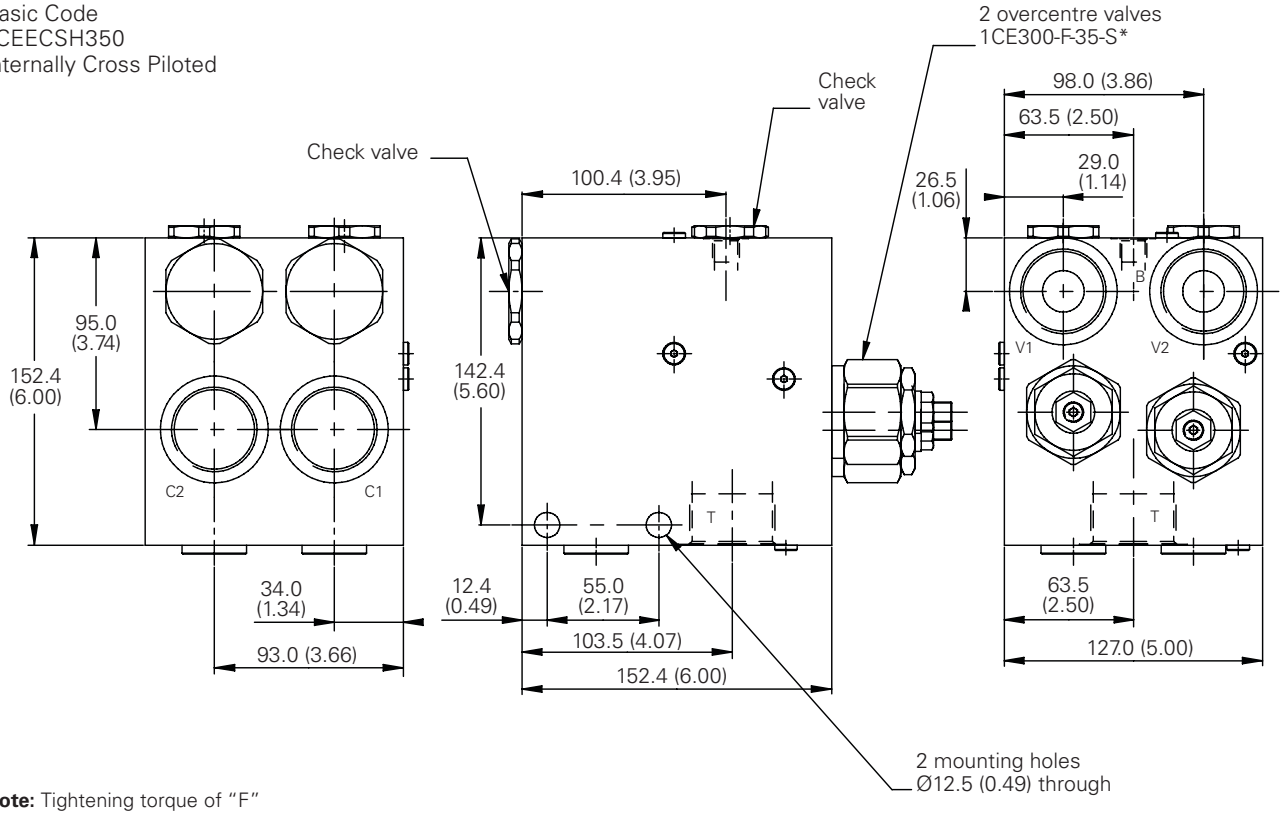
7 Body material

377 - Steel

Dimensions

mm (inch)

Complete valve
1 1/4" Ports
Basic Code
1CEECSH350
Internally Cross Piloted



Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

Beyond standard value

Industrial hose styles include:

- Armorcat®
- Bobcat®
- Boston® Bulldog Gold
- Chemcat®
- Concord® Steam
- Contractors Water
- Easy Couple
- Puma®
- Royalflex®
- Ultraforce®

New Bio-Diesel hose style:

- GH100 ESP™

New CARB/EPA/IMCI approved fuel products:

- EH049 ESP™ Tubing
- EH089 ESP™ Hose

Industrial Hose Solutions

Eaton has the breadth and depth of products readily available to meet specific chemical and industrial hose needs—all at a reasonable price. Eaton and our vast distribution network are focused on providing sustainable products and solutions designed to conserve resources and protect the environment. From low-pressure air and water to hazardous chemical transfer, look to Eaton's Industrial Hose Solutions.

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Check the Distributor Locator link at the following site for the local Eaton industrial hose distributor closest to you to get an update on "Industrial Hose Solutions"

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An Eaton Green Solution

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

The valves function is to prevent uncontrolled lowering of the boom in the event of hose rupture.

These valves comply with International Standard ISO8643 for hydraulic excavators and backhoe loaders incorporating servo pilot systems. The valves' function is to prevent uncontrolled towering of the boom in the event of hose rupture. Closure of the valve is activated by bringing the main control valve lever to the neutral position.
By separating the relief and pilot function into two individual cartridges, the pilot cartridge has no relieving function, hence any load on the valve does not affect its opening characteristics. Consequently, the valve will always open at the same pilot pressure/joystick position, regardless of load. This feature enables the valve to be tuned to open in harmony with the machine's own main control valve, giving better control.

The pilot cartridge is generally set to dwell 1 to 2 bar behind the main control valve, therefore the Integrated Hydraulics valve takes control in the event of hose failure.

When fitted to the arm/dipper cylinder, this dwell behind the main control valve prevents acceleration when 'arm down' is selected.

Fig. 1 and 2 show typical circuits utilizing these components.

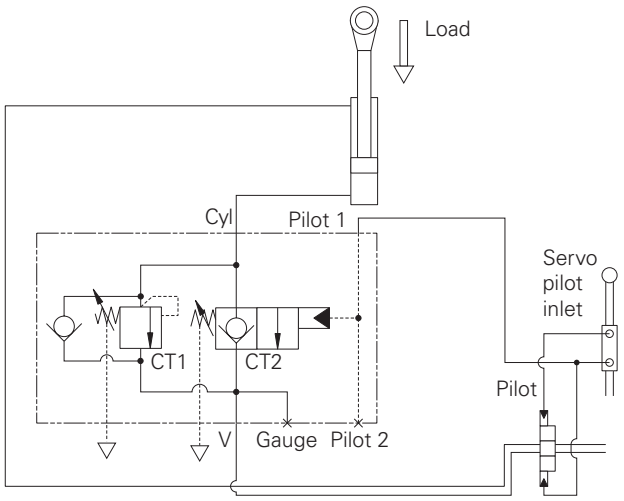
Line mountings or SAE flange mountings are available for direct fitment to the actuator. Where line mounted models are used it is essential that steel pipes are used between the valve and the actuator.

All components are manufactured in steel and are electroplated for corrosion protection.

Typical circuit

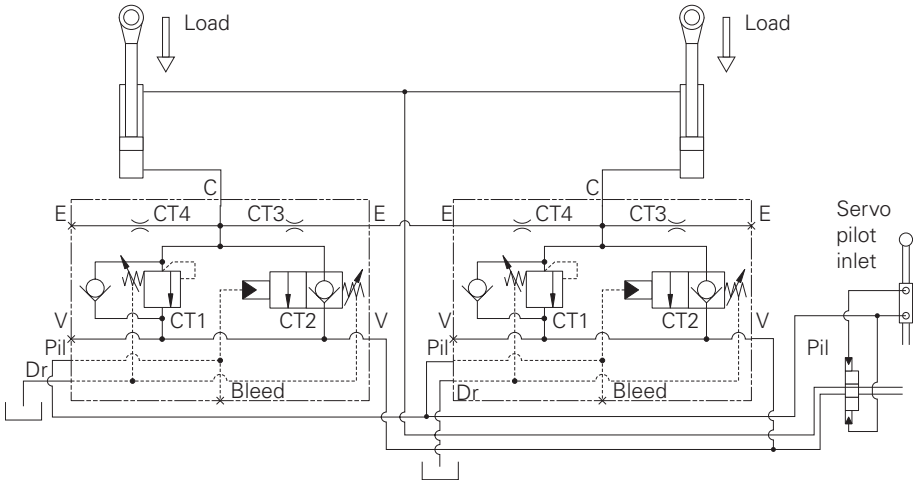
Compact machinery

(see page F-640 to F-650)
For flows up to 30 and 40 L/min
Fig. 1



Heavy machinery

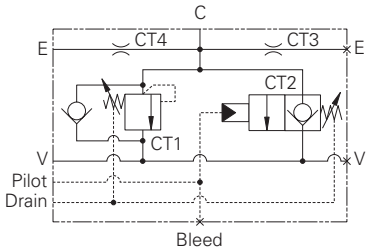
(see page F-600 to F-630)
For flows up to 250, 350 and 550 L/min
Fig. 2



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL256 - BoomLoc valve

Hose burst protection, flange mounted with independent pilot control (Ref. ISO 8643)
250 L/min (66 USgpm) • 350 bar (5000 psi)



Operation

By connecting the hose rupture valve pilot in parallel with the directional spool valve pilot, and adjusting the opening characteristics of the hose rupture valve to suit that of the spool valve "BoomLoc" may be set so as not to interfere with the normal operation of the machine.

Fine adjustment of the pilot pressure permits the optimum setting to be made in differing operating systems.

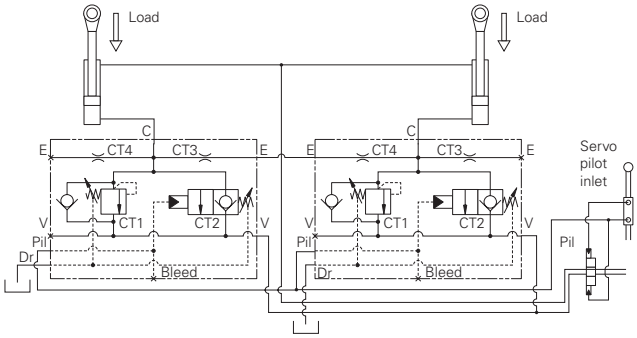
Both the pilot and the relief sections are unaffected by back pressure, enabling the service line relief's to operate normally. In the event of hose failure, the control will be passed from the main spool to the "BoomLoc" valve, maintaining control of the cylinder.

Regardless of the load the pilot pressure requirement remains constant as the valve is unaffected by load induced pressure, the poppet being fully balanced with zero differential area.

Features

This is a compact design with good dirt tolerance. Hardened poppets and seats provide excellent load holding characteristics with all the advantages of the cartridge insert.

Typical circuit



F

Description

These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

They were designed to give relief, load holding and hose failure protection to systems where a pilot system controls the directional valves.

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	250 L/min (66 USgpm)
Max setting	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated and passivated.
Standard housing materials	Bright drawn mild steel bar. Zinc plated and passivated.
Mounting position	Flange mounted
Weight	7.5 kg (16.5 lbs)
Seal kit	SK1162P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.6 ml/min (10 dpm)
Nominal viscosity range	5 to 500 cSt

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL256 - BoomLoc valve

Hose burst protection, flange mounted with independent pilot control (Ref. ISO 8643)
250 L/min (66 USgpm) • 350 bar (5000 psi)

Model code

1CEBL256 – F 3/4 6 – 35 P

1 2 3 4 5 6

1 Basic code

1CEBL256 - Cartridges and body

2 Adjustment means

F - Screw adjustment

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

3/4 - 3/4" SAE flange cylinder port slotted for 3000 & 6000)
3/4" SAE Flange valve port (thread G1/2)
1/8" BSP bleed port
1/4" BSP all other ports

4 SAE port type

6 - SAE 6000 (Valve port)

5 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.
35 - 70-350 bar.
Std setting 350 bar

Std setting made at 4.8 L/min

6 Seals

P - Contains polyurethane and standard seal.

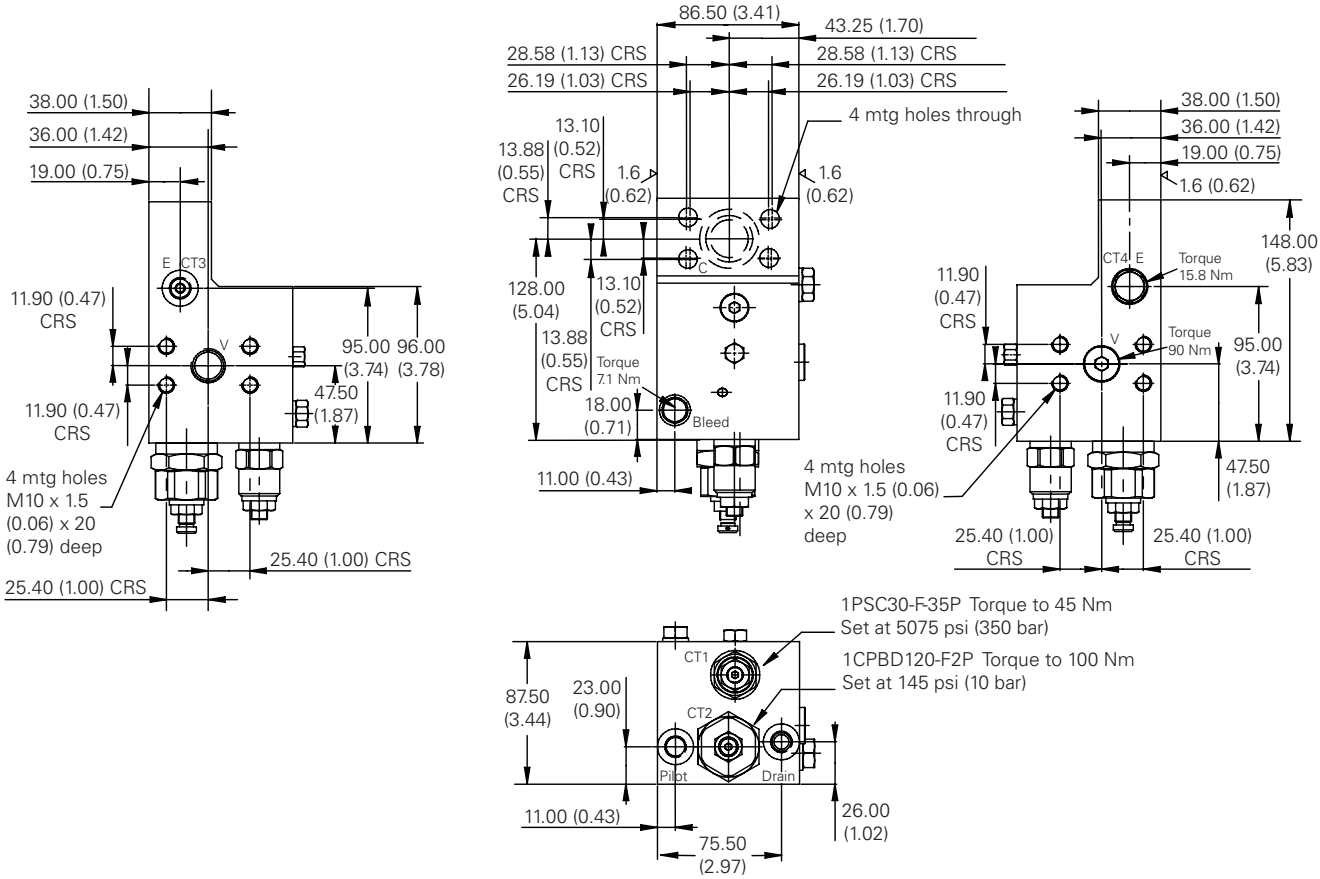
Dimensions

mm (inch)

Flange mounted
Basic Code
1CEBL256

Note: Cylinder port bolt holes are slotted for fitment to both SAE 3000 & SAE 6000 mounting faces.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

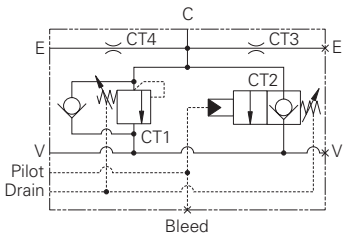


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEBL356 - BoomLoc valve

Hose burst protection, flange mounted with independent pilot control (Ref. ISO 8643)
350 L/min (92 USgpm) • 350 bar (5000 psi)



Operation

By connecting the hose rupture valve pilot in parallel with the directional spool valve pilot, and adjusting the opening characteristics of the hose rupture valve to suit that of the spool valve "BoomLoc" may be set so as not to interfere with the normal operation of the machine.

Fine adjustment of the pilot pressure permits the optimum setting to be made in differing operating systems.

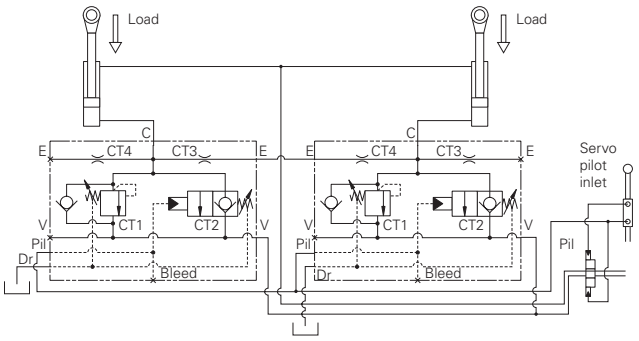
Both the pilot and the relief sections are unaffected by backpressure, enabling the service line relief's to operate normally. In the event of hose failure, the control will be passed from the main spool to the "BoomLoc" valve, maintaining control of the cylinder.

Regardless of the load the pilot pressure requirement remains constant as the valve is unaffected by load induced pressure, the poppet being fully balanced with zero differential area.

Features

This is a compact design with good dirt tolerance. Hardened poppets and seats provide excellent load holding characteristics with all the advantages of the cartridge insert.

Typical circuit



Description

These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

They were designed to give relief, load holding and hose failure protection to systems where a pilot system controls the directional valves.

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	350 L/min (92 USgpm)
Max setting	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated and passivated.
Standard housing materials	Bright drawn M.S. bar zinc plated and passivated
Mounting position	Flange mounted
Weight	7.5 kg (16.5 lbs)
Seal kit	SK1161P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to 90°C (-22° to +194°F)
Internal leakage	0.6 ml/min (10 dpm)
Nominal viscosity range	5 to 500 cSt

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL356 - BoomLoc valve

Hose burst protection, flange mounted with independent pilot control (Ref. ISO 8643)
350 L/min (92 USgpm) • 350 bar (5000 psi)

Model code

1CEBL356 – F 1 6 – 35 P

1 2 3 4 5 6

1 Basic code

1CEBL356 - Cartridges and body

2 Adjustment means

F - Screw adjustment

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

1 - 1" SAE Flange cylinder port (slotted for 3000 & 6000)
1" SAE Flange valve port (thread G3/4)
1/8" BSP bleed port
1/4" BSP all other ports

4 SAE port type

6 - SAE 6000 (valve port)

5 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - 70-350 bar.
Std setting 350 bar

Std setting made at 4.8 L/min

6 Seals

P - Contains polyurethane and standard seal.

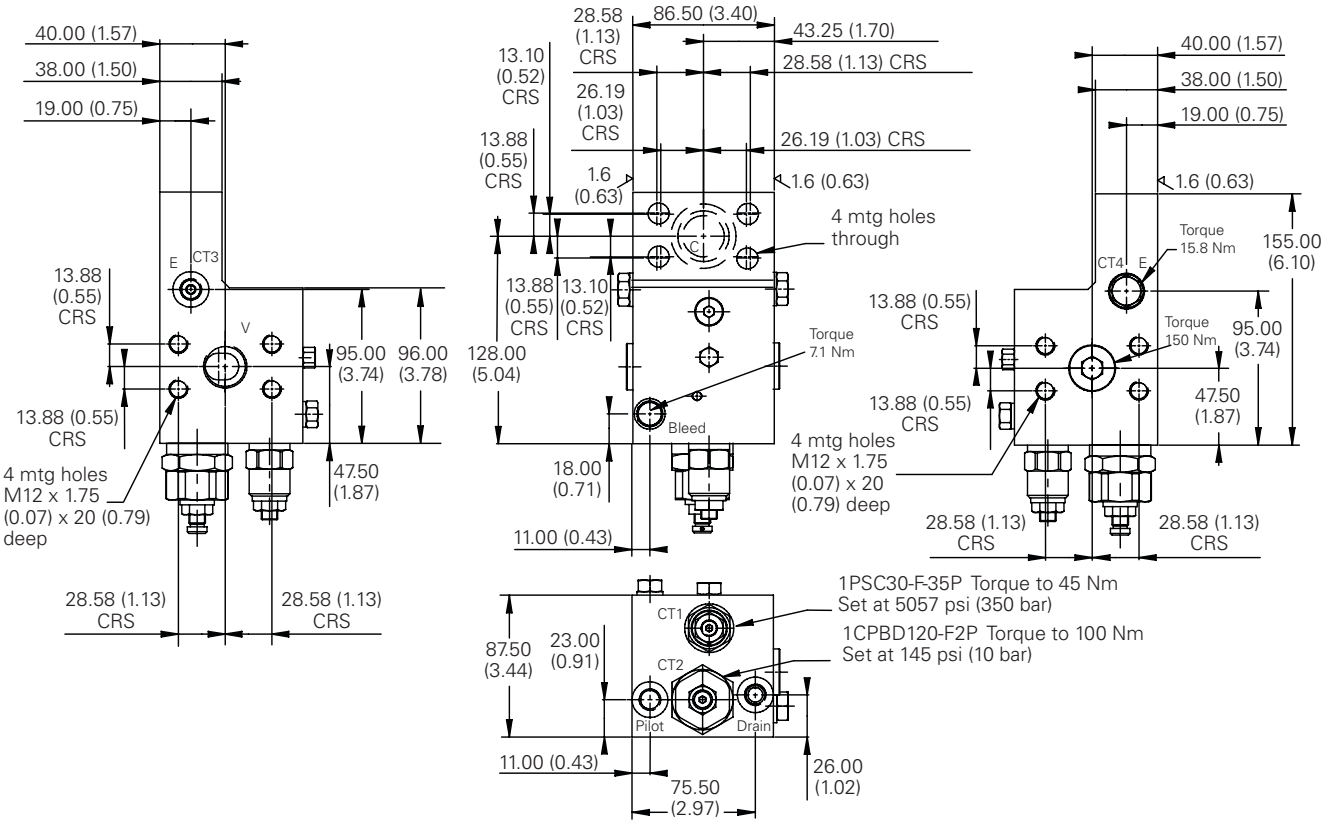
Dimensions

mm (inch)

Complete valve
Flange Mounted
Basic Code
1CEBL356

Note: Cylinder port bolt holes are slotted for fitment to both SAE 3000 & SAE 6000 mounting faces.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

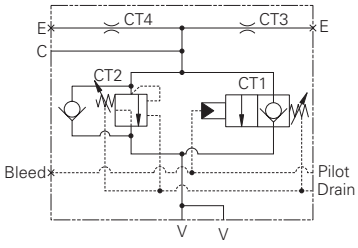


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEBL556 - BoomLoc valve

Hose burst protection, flange mounted with independent pilot control (Ref. ISO 8643)
550 L/min (145 USgpm) • 400 bar (5800 psi)



Operation

By connecting the hose rupture valve pilot in parallel with the directional spool valve pilot, and adjusting the opening characteristics of the hose rupture valve to suit that of the spool valve "BoomLoc" may be set so as not to interfere with the normal operation of the machine. Fine adjustment of the pilot pressure permits the optimum setting to be made in differing operating systems.

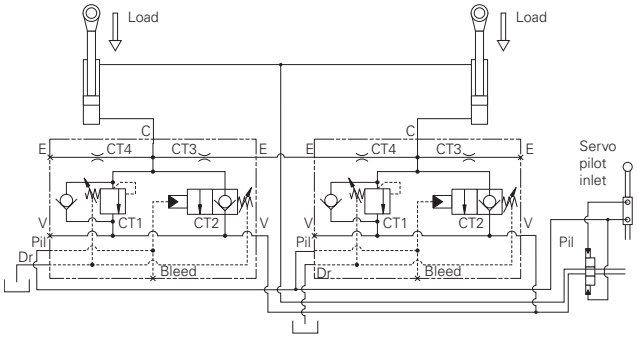
Both the pilot and the relief sections are unaffected by backpressure, enabling the service line relief's to operate normally. In the event of hose failure, the control will be passed from the main spool to the "BoomLoc" valve, maintaining control of the cylinder.

Regardless of the load the pilot pressure requirement remains constant as the valve is unaffected by load induced pressure, the poppet being fully balanced with zero differential area.

Features

This is a compact design with good dirt tolerance. Hardened poppets and seats provide excellent load holding characteristics with all the advantages of the cartridge insert.

Typical circuit



Description

These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

They were designed to give relief, load holding and hose failure protection to systems where a pilot system controls the directional valves.

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	550 L/min (145 USgpm)
Max setting	400 bar (5800 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated and passivated.
Standard housing materials	Bright drawn M.S. bar zinc plated and passivated
Mounting position	Flange mounted
Weight	21 kg (46.2 lbs)
Seal kit	SK1163P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	4.3 ml/min (70 dpm)
Nominal viscosity range	5 to 500 cSt

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL556 - BoomLoc valve

Hose burst protection, flange mounted with independent pilot control (Ref. ISO 8643)
550 L/min (145 USgpm) • 400 bar (5800 psi)

Model code

1CEBL556 – F 5/4 6 – 40 P

1 2 3 4 5 6

1 Basic code

ICEBL556 - Cartridges and body

2 Adjustment means

F - Screw adjustment

For fixed versions add setting in 10 bar increments to end of part number. Subject to a +/-10% tolerance.

3 Port size

5/4 - 1 1/4" SAE Flange cylinder port
1 1/4" SAE Flange valve port
1/4" BSP all other ports

4 SAE port type

6 - SAE 6000

5 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.
40 - 70-400 bar.
Std setting 350 bar

Std setting made at 4.8 L/min

6 Seals

P - Contains polyurethane and standard seal.

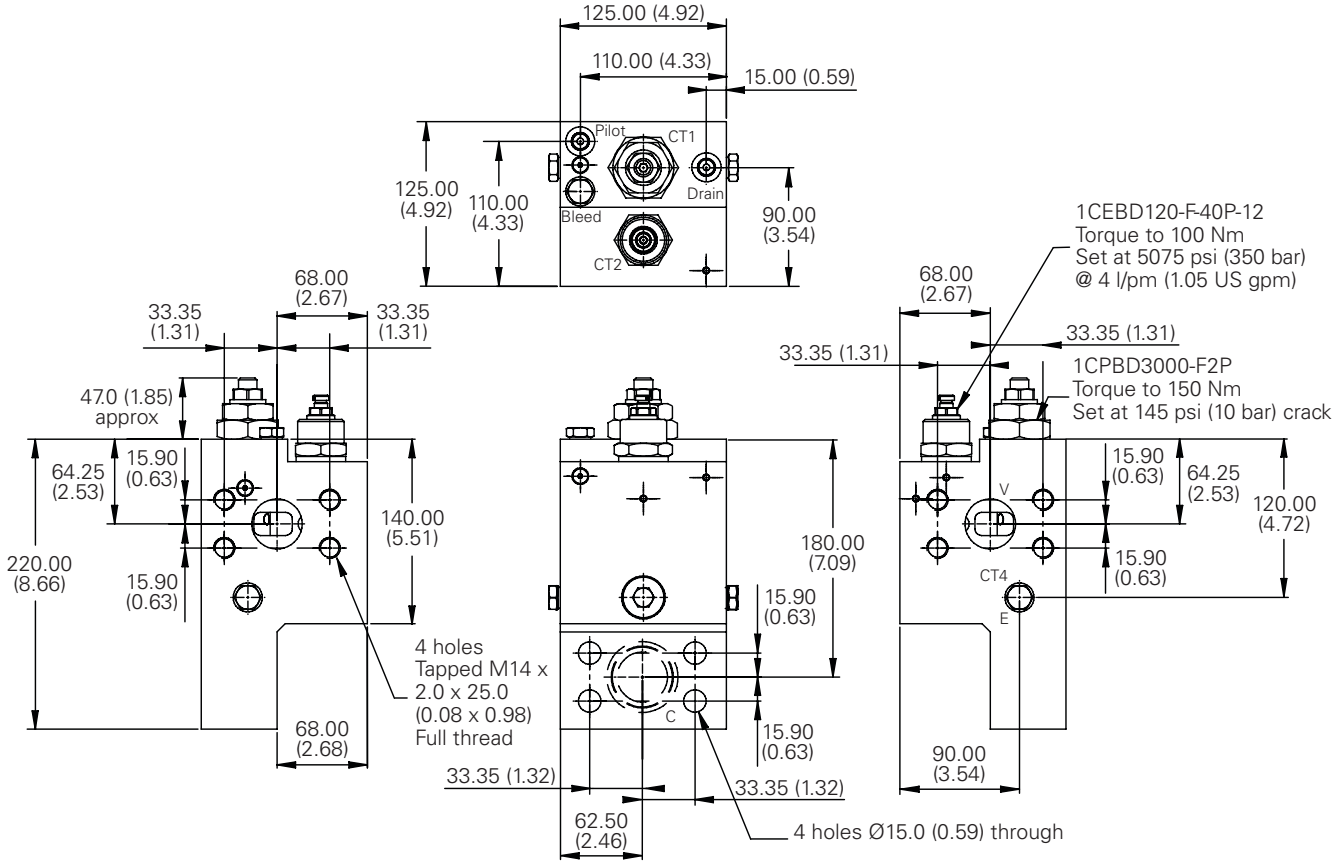
Dimensions

mm (inch)

Complete valve
Flange Mounted
Basic Code
1CEBL356

Note: Cylinder port bolt holes are slotted for fitment to both SAE 3000 & SAE 6000 mounting faces.

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

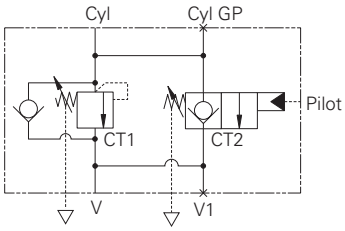


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEBL31 - BoomLoc valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
30 L/min (8 USgpm) • 350 bar (5000 psi)



Operation

By connecting the hose rupture valve pilot in parallel with the directional spool valve pilot, and adjusting the opening characteristics of the hose rupture valve to suit that of the spool valve "BoomLoc" may be set so as not to interfere with the normal operation of the machine. Fine adjustment of the pilot pressure permits the optimum setting to be made in differing operating systems.

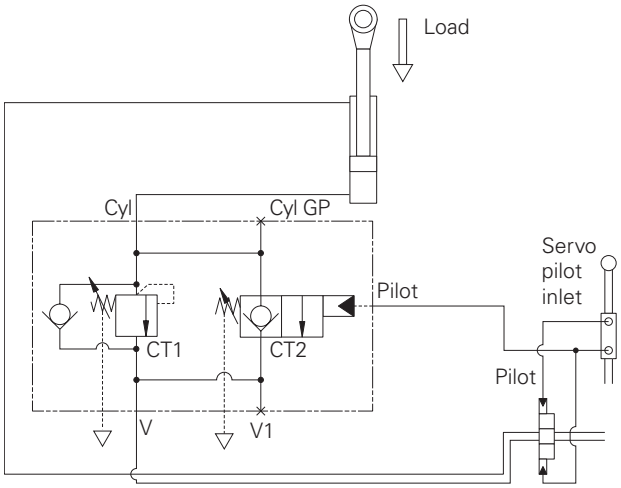
Both the pilot and the relief sections are unaffected by backpressure, enabling the service line relief's to operate normally. In the event of hose failure, the control will be passed from the main spool to the "BoomLoc" valve, maintaining control of the cylinder.

Regardless of the load the pilot pressure requirement remains constant as the valve is unaffected by load induced pressure, the poppet being fully balanced with zero differential area.

Features

This is a compact design with good dirt tolerance. Hardened poppets and seats provide excellent load holding characteristics with all the advantages of the cartridge insert.

Typical circuit



Description

These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

They were designed to give relief, load holding and hose failure protection to systems where a pilot system controls the directional valves.

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max setting	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated and passivated.
Standard housing materials	Bright drawn M.S. bar zinc plated and passivated
Mounting position	Line mounted
Weight	2 kg (4.4 lbs)
Seal kit	SK1164P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to 90°C (-22° to +194°F)
Internal leakage	0.6 ml/min (10 dpm)
Nominal viscosity range	5 to 500 cSt

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL31 - BoomLoc valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
30 L/min (8 USgpm) • 350 bar (5000 psi)

Model code

1CEBL31 – F 3W – 35 P

1 2 3 4 5

1 Basic code
1CEBL31 - Cartridges and body

2 Adjustment means
F - Screw adjustment

For fixed versions add setting in 10 bar increments to end of part number. Subject to a +/-10% tolerance.

3 Port size
3W - 3/8" BSP cylinder port
3/8" BSP valve port
1/4" BSP all other ports

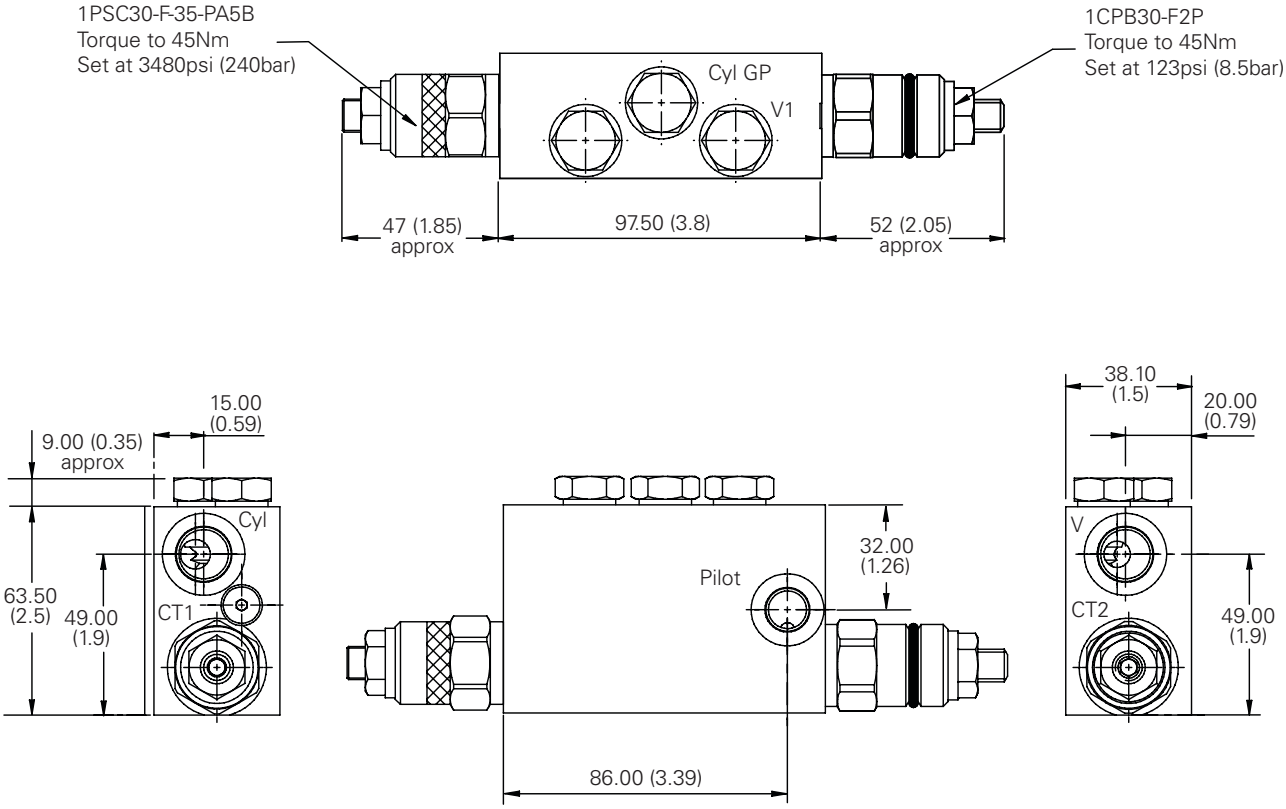
4 Pressure range @ 4.8 L/min
Note: Code based on pressure in bar.
35 - 70-350 bar.
Std setting 240 bar

5 Seals
P - Contains polyurethane and standard seal.

Dimensions
mm (inch)

Complete valve
Line Mounted (Ref ISO 8643)
Basic Code
1CEBL31

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

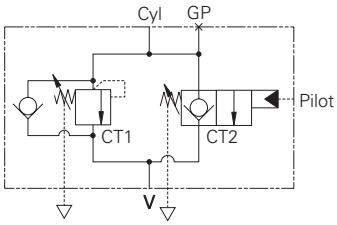


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEBL31 - BoomLoc valve

Hose burst protection, flange mounted with independent pilot control (Ref. ISO 8643)
30 L/min (8 USgpm) • 350 bar (5000 psi)



Operation

By connecting the hose rupture valve pilot in parallel with the directional spool valve pilot, and adjusting the opening characteristics of the hose rupture valve to suit that of the spool valve "BoomLoc" may be set so as not to interfere with the normal operation of the machine. Fine adjustment of the pilot pressure permits the optimum setting to be made in differing operating systems.

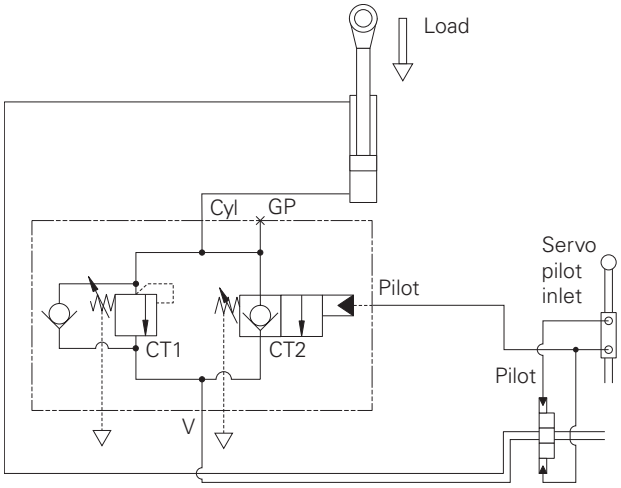
Both the pilot and the relief sections are unaffected by backpressure, enabling the service line relief's to operate normally. In the event of hose failure, the control will be passed from the main spool to the "BoomLoc" valve, maintaining control of the cylinder.

Regardless of the load the pilot pressure requirement remains constant as the valve is unaffected by load induced pressure, the poppet being fully balanced with zero differential area.

Features

This is a compact design with good dirt tolerance. Hardened poppets and seats provide excellent load holding characteristics with all the advantages of the cartridge insert.

Typical circuits



Description

These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

They were designed to give relief, load holding and hose failure protection to systems where a pilot system controls the directional valves.

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max setting	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated and passivated.
Standard housing materials	Bright drawn M.S. bar zinc plated and passivated
Mounting position	Flange mounted
Weight	2 kg (4.4 lbs)
Seal kit	SK1165P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.6 ml/min (10 dpm)
Nominal viscosity range	5 to 500 cSt

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL31 - BoomLoc valve

Hose burst protection, flange mounted with independent pilot control (Ref. ISO 8643)
30 L/min (8 USgpm) • 350 bar (5000 psi)

Model code

1CEBL31 – F 1/2 – 6 – 35 P

1 2 3 4 5 6

1 Basic code
1CEBL31 - Cartridges and body

2 Adjustment means
F - Screw adjustment
For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size
1/2 - 1/2" SAE flange
3/8" BSP valve port
1/4" BSP all other ports

4 SAE port type
6 - SAE 6000

5 Pressure range @ 4.8 L/min
Note: Code based on pressure in bar.
35 - 70-350 bar.
Std setting 240 bar
Std setting made at 4.8 L/min

6 Seals
P - Contains polyurethane and standard seal.

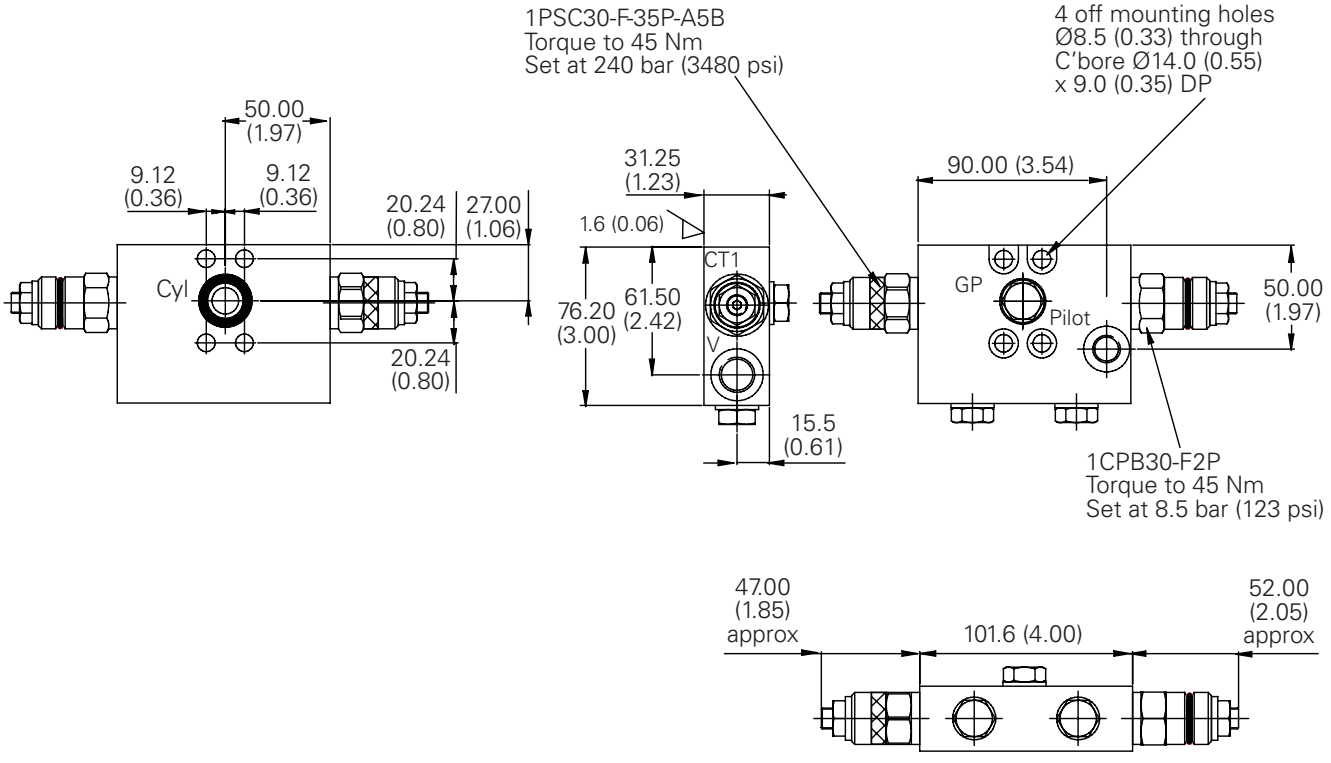
F

Dimensions

mm (inch)

Complete valve
Flange Mounted
Basic Code
1CEBL31

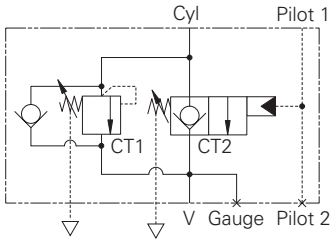
Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL31 - BoomLoc valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
30 L/min (8 USgpm) • 350 bar (5000 psi)



Operation

By connecting the hose rupture valve pilot in parallel with the directional spool valve pilot, and adjusting the opening characteristics of the hose rupture valve to suit that of the spool valve "BoomLoc" may be set so as not to interfere with the normal operation of the machine. Fine adjustment of the pilot pressure permits the optimum setting to be made in differing operating systems.

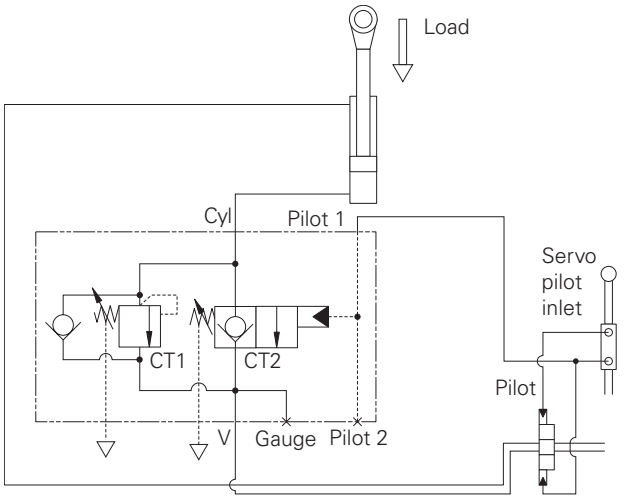
Both the pilot and the relief sections are unaffected by backpressure, enabling the service line relief's to operate normally. In the event of hose failure, the control will be passed from the main spool to the "BoomLoc" valve, maintaining control of the cylinder.

Regardless of the load the pilot pressure requirement remains constant as the valve is unaffected by load induced pressure, the poppet being fully balanced with zero differential area.

Features

This is a compact design with good dirt tolerance. Hardened poppets and seats provide excellent load holding characteristics with all the advantages of the cartridge insert.

Typical circuit



Description

These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

They were designed to give relief, load holding and hose failure protection to systems where a pilot system controls the directional valves.

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	30 L/min (8 USgpm)
Max setting	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated and passivated.
Standard housing materials	Bright drawn M.S. bar zinc plated and passivated
Mounting position	Line mounted
Weight	2 kg (4.4 lbs)
Seal kit	SK1164P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to 90°C (-22° to +194°F)
Internal leakage	0.6 ml/min (10 dpm)
Nominal viscosity range	5 to 500 cSt

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL31 - BoomLoc valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
30 L/min (8 USgpm) • 350 bar (5000 psi)

Model code

1CEBL31 – F 4W – 35 P

1 2 3 4 5

1 Basic code

1CEBL31 - Cartridges and body

2 Adjustment means

F - Screw adjustment

For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

4W - 1/2" BSP cylinder port
1/2" BSP valve port
1/4" BSP all other ports

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.

35 - 70-350 bar.
Std setting 280 bar

Std setting made at 4.8 L/min

5 Seals

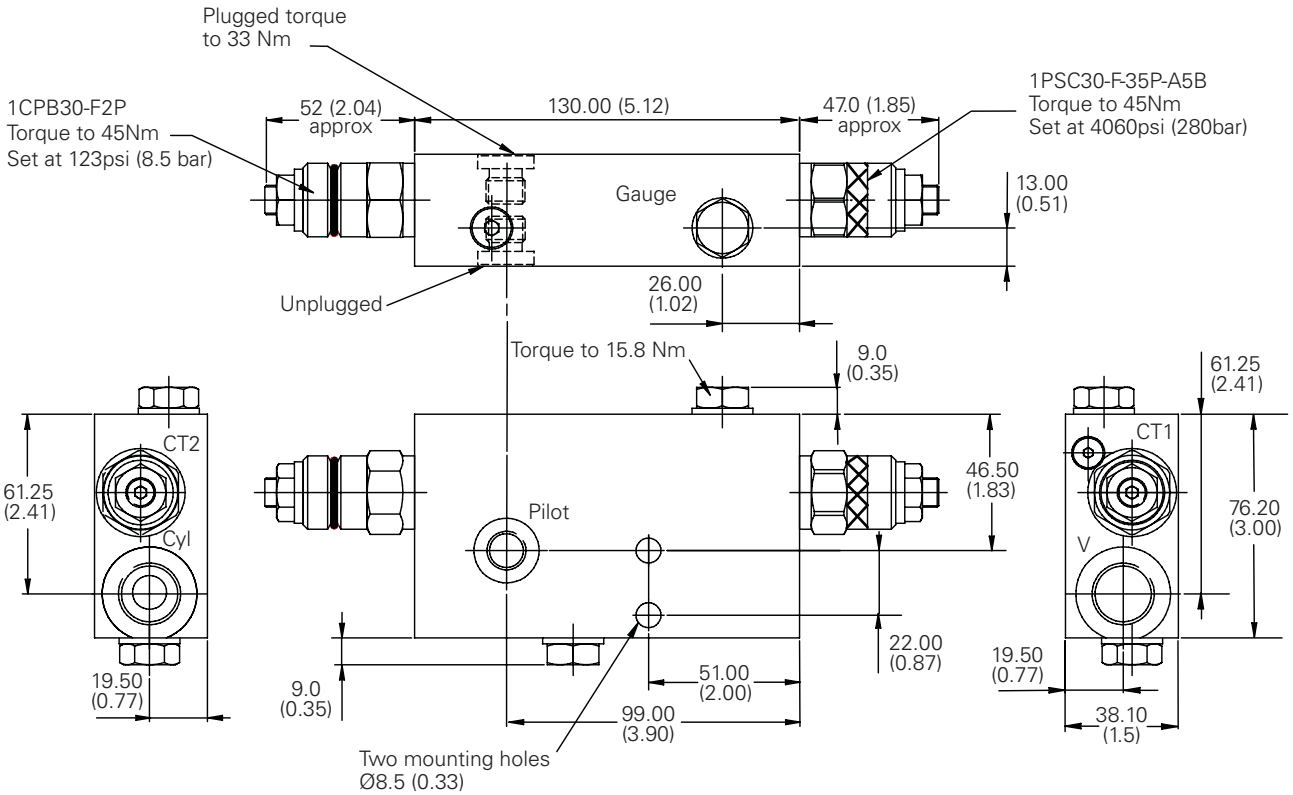
P - Contains polyurethane and standard seal.

Dimensions

mm (inch)

Complete valve
Line Mounted
Basic Code
1CEBL31

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

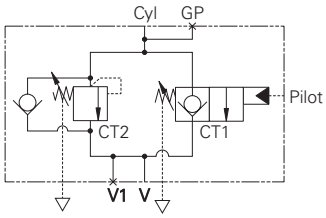


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEBL91 - BoomLoc valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
90 L/min (24 USgpm) • 350 bar (5000 psi)



Operation

By connecting the hose rupture valve pilot in parallel with the directional spool valve pilot, and adjusting the opening characteristics of the hose rupture valve to suit that of the spool valve "BoomLoc" may be set so as not to interfere with the normal operation of the machine. Fine adjustment of the pilot pressure permits the optimum setting to be made in differing operating systems.

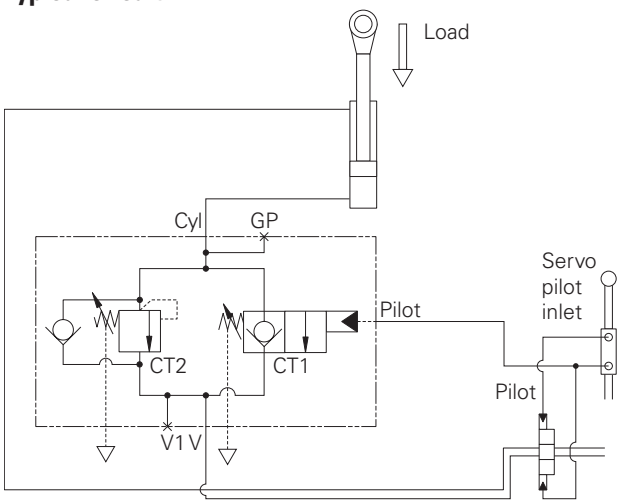
Both the pilot and the relief sections are unaffected by backpressure, enabling the service line relief's to operate normally. In the event of hose failure, the control will be passed from the main spool to the "BoomLoc" valve, maintaining control of the cylinder.

Regardless of the load the pilot pressure requirement remains constant as the valve is unaffected by load induced pressure, the poppet being fully balanced with zero differential area.

Features

This is a compact design with good dirt tolerance. Hardened poppets and seats provide excellent load holding characteristics with all the advantages of the cartridge insert.

Typical circuit



Description

These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

They were designed to give relief, load holding and hose failure protection to systems where a pilot system controls the directional valves.

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	90 L/min (24 USgpm)
Max setting	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated and passivated.
Standard housing materials	Bright drawn M.S. bar zinc plated and passivated
Mounting position	Line mounted
Weight	3.5 kg (7.7 lbs)
Seal kit	SK1166P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to 90°C (-22° to +194°F)
Internal leakage	0.6 ml/min (10 dpm)
Nominal viscosity range	5 to 500 cSt

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL91 - BoomLoc valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
90 L/min (24 USgpm) • 350 bar (5000 psi)

Model code

1CEBL91 – F 4W – 35 P

1 2 3 4 5

1 Basic code

1CEBL91 - Cartridges and body

2 Adjustment means

F - Screw adjustment
For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

4W - 1/2" BSP cylinder port
1/2" BSP valve port "V"
1/4" BSP "V1" & all other ports

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.
35 - 70-350 bar.
Std setting 280 bar

Std setting made at 4.8 L/min

5 Seals

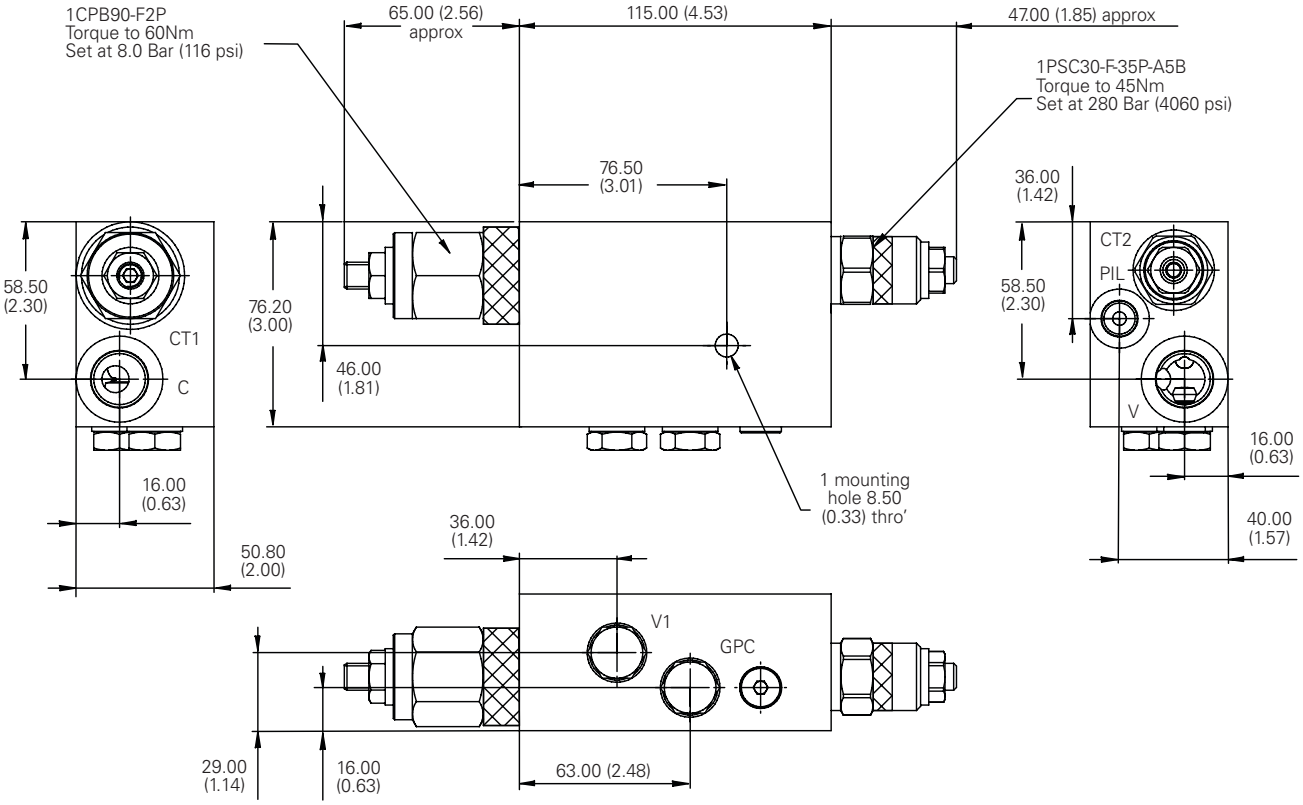
P - Contains polyurethane and standard seal.

Dimensions

mm (inch)

Complete valve
Line Mounted
Basic Code
1CEBL91

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

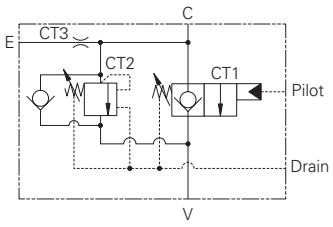


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEBL151 - BoomLoc valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
150 L/min (40 USgpm) • 350 bar (5000 psi)



Operation

By connecting the hose rupture valve pilot in parallel with the directional spool valve pilot, and adjusting the opening characteristics of the hose rupture valve to suit that of the spool valve "BoomLoc" may be set so as not to interfere with the normal operation of the machine. Fine adjustment of the pilot pressure permits the optimum setting to be made in differing operating systems.

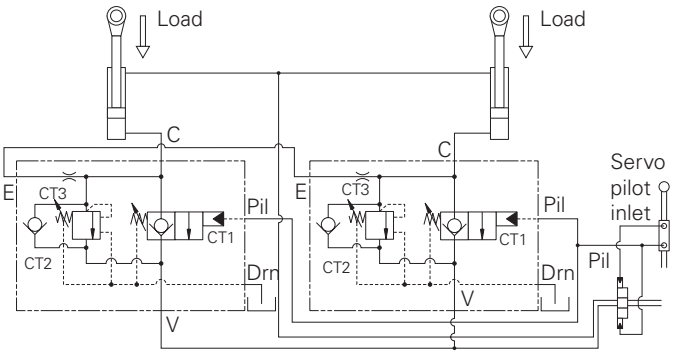
Both the pilot and the relief sections are unaffected by backpressure, enabling the service line relief's to operate normally. In the event of hose failure, the control will be passed from the main spool to the "BoomLoc" valve, maintaining control of the cylinder.

Regardless of the load the pilot pressure requirement remains constant as the valve is unaffected by load induced pressure, the poppet being fully balanced with zero differential area.

Features

This is a compact design with good dirt tolerance. Hardened poppets and seats provide excellent load holding characteristics with all the advantages of the cartridge insert.

Typical circuit



Description

These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

They were designed to give relief, load holding and hose failure protection to systems where a pilot system controls the directional valves.

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40°C Viscosity = 32 cSt (150 SUS)	
Rated flow	150 L/min (40 USgpm)
Max setting	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated and passivated.
Standard housing materials	Bright drawn M.S. bar zinc plated and passivated
Mounting position	Line mounted
Weight	3 kg (6.6 lbs)
Seal kit	SK947P (Polyurethane/Nitrile)
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	0.6 ml/min (10 dpm)
Nominal viscosity range	5 to 500 cSt

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL151 - BoomLoc Valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
150 L/min (40 USgpm) • 350 bar (5000 psi)

Model code

1CEBL151 – F 4W – 35 P

1 2 3 4 5

1 Basic code

1CEBL151 - Cartridges and body

2 Adjustment means

F - Screw adjustment
For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

4W - 1/2" BSP cylinder port
1/2" BSP valve port
G1/8" all other ports

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.
35 - 70-350 bar.
Std setting 260 bar
Std setting made at 4.8 L/min

5 Seals

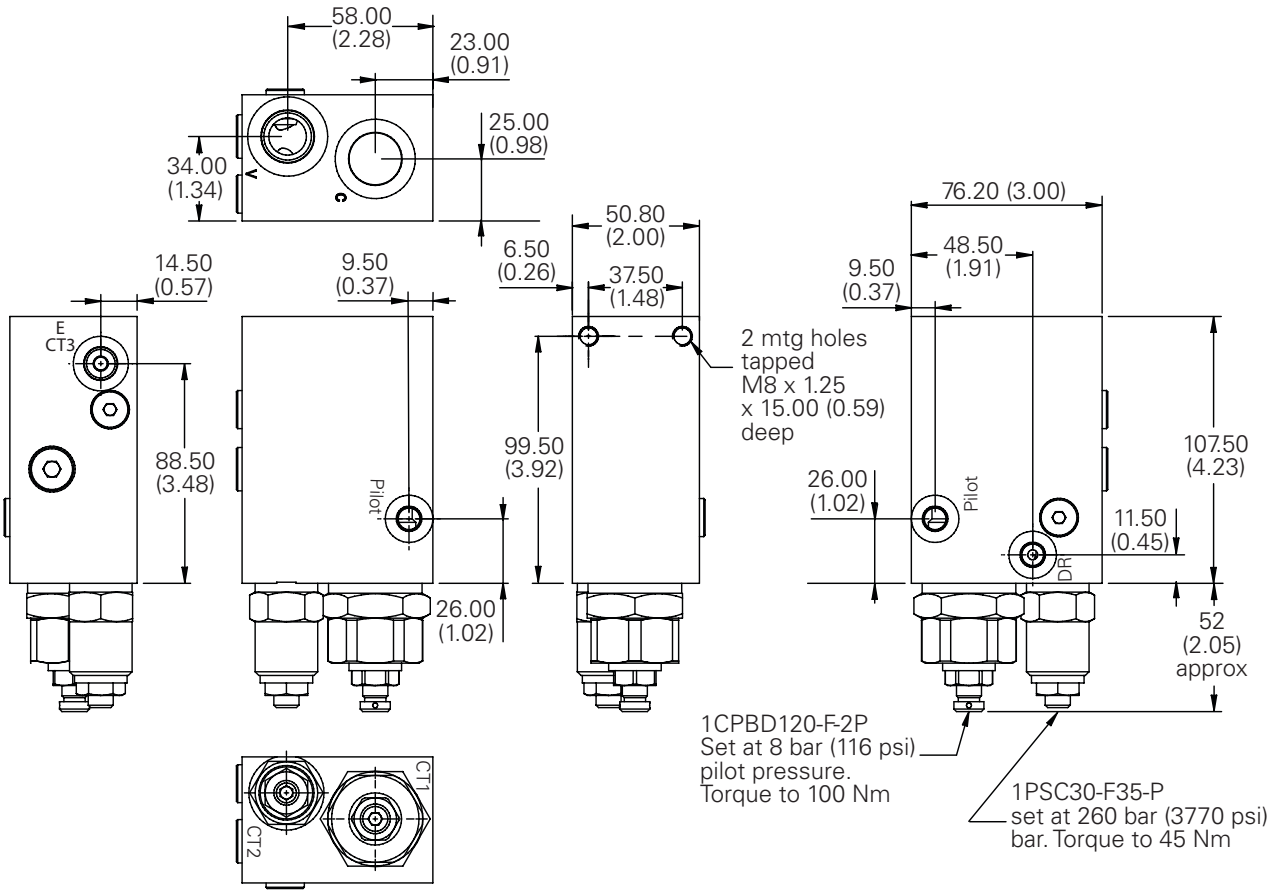
P - Contains polyurethane and standard seal.

Dimensions

mm (inch)

Complete valve
Line Mounted
Basic Code
1CEBL151

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.

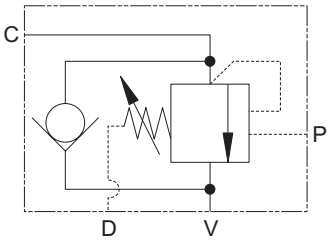


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

1CEBL153 - BoomLoc valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
150 L/min (40 USgpm) • 350 bar (5000 psi)



Operation

By connecting the pilot line in parallel with the spool valve pilot, the high pilot ratio allows the valve to open just prior to the spool valve, ensuring that the valve does not interfere with the normal operation of the machine. Both the pilot and the relief sections are unaffected by back pressure, enabling the service line reliefs to operate normally, without interfering with the spool valve control as it meters the return flow. In the event of hose failure, the control will be passed from the main spool to the overcenter valve, maintaining control of the cylinder.

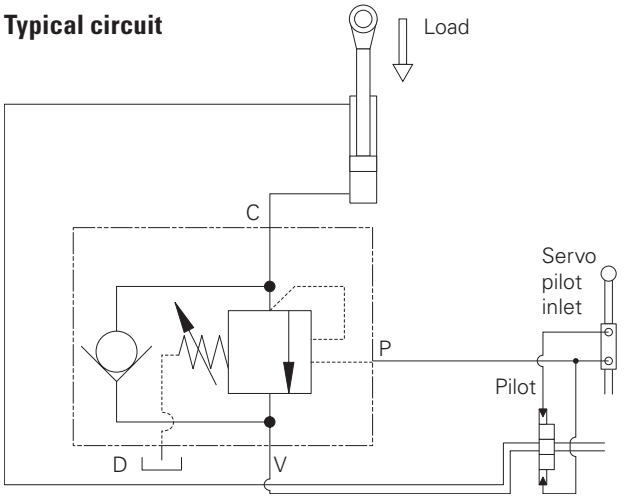
The pressure required to open the valve and start actuator movement can be calculated as follows:

$$\text{Pilot Pressure} = \frac{\text{(Relief Setting) - (Load Pressure)}}{\text{Pilot Ratio}}$$

Features

This is a compact design with good dirt tolerance. Hardened poppets and seats provide excellent load holding characteristics with all the advantages of the cartridge insert.

Typical circuit



Description

These overcenter valves are suitable for use on the boom and dipper cylinders of an excavator to help the manufacturer or user comply with standard ISO8643.

They were designed to give relief, load holding and hose failure protection to systems where a pilot system controls the directional valves.

Performance data

Ratings and specifications

Figures based on: Oil Temp = 40˚C Viscosity = 32 cSt (150 SUS)	
Rated flow	150 L/min (40 USgpm)
Max setting	350 bar (5000 psi)
Cartridge material	Working parts hardened and ground steel. External surfaces electroless nickel plated and passivated.
Standard housing materials	Bright drawn M.S. bar zinc plated and passivated
Mounting position	Mount directly to cylinder using steel pipe
Weight	1.5 kg (3.3 lbs)
Seal kit	SK924P
Filtration	BS5540/4 Class 18/13 (25 micron nominal)
Temperature range	-30° to +90°C (-22° to +194°F)
Internal leakage	1.5 ml/min
Nominal viscosity range	5 to 500 cSt

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

1CEBL153 - BoomLoc valve

Hose burst protection, line mounted with independent pilot control (Ref. ISO 8643)
150 L/min (40 USgpm) • 350 bar (5000 psi)

Model code

1CEBL153 – F 4W – 35 P

1 2 3 4 5

1 Basic code

1CEBL153 - Cartridges and body

2 Adjustment means

F - Screw adjustment
For fixed versions add setting in 10 bar increments to end of part number. Subject to a ±10% tolerance.

3 Port size

4W - 1/2" BSP cylinder port
1/2" BSP valve port
1/4" BSP pilot port/drain port

4 Pressure range @ 4.8 L/min

Note: Code based on pressure in bar.
35 - 70-350 bar.
Std setting 350 bar

Std setting made at 4.8 L/min

5 Seals

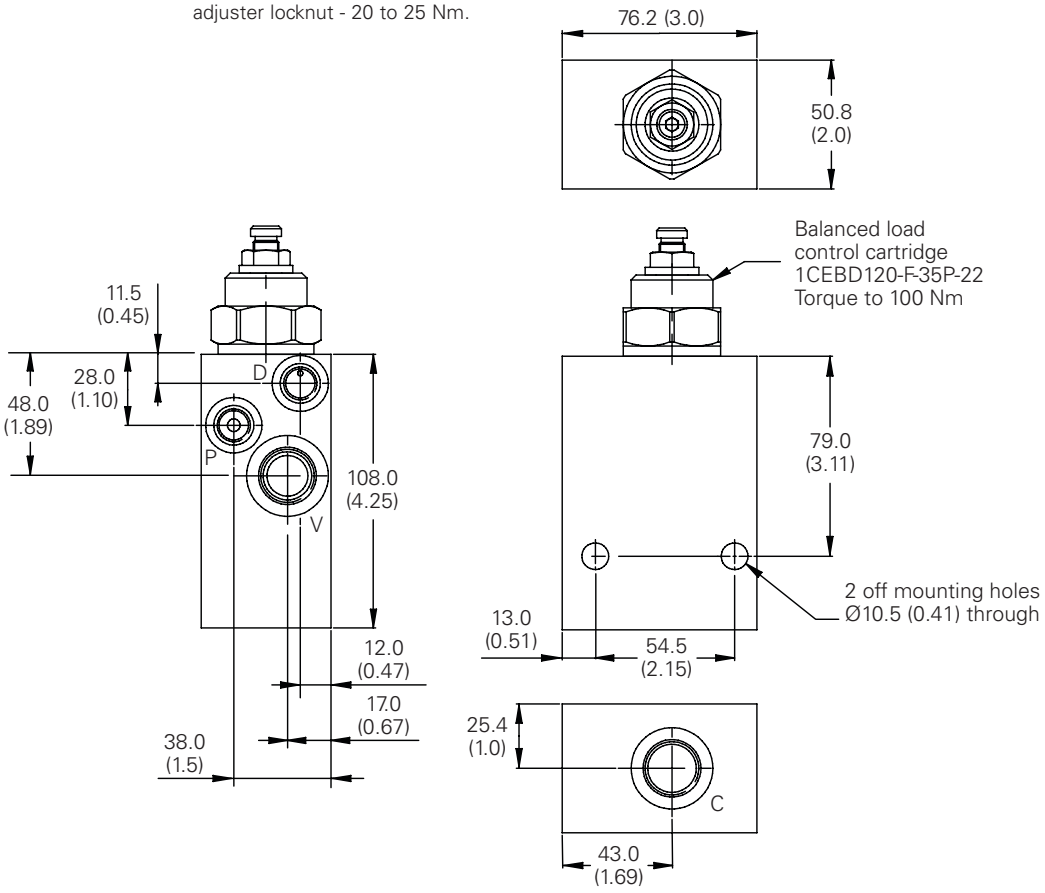
P - Contains polyurethane and standard seal.

Dimensions

mm (inch)

Complete valve
Line Mounted
Basic Code
1CEBL153

Note: Tightening torque of "F" adjuster locknut - 20 to 25 Nm.



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

F

Problem:
White-Knuckled About Motor Performance?

Solution:
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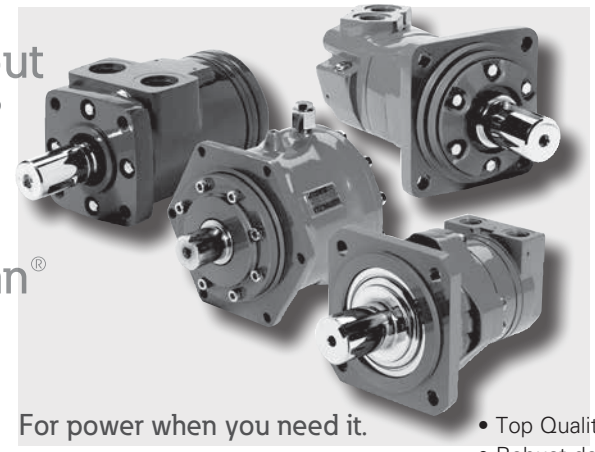

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- Efficient performance
- Wide range of fluid capabilities
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Problem:
Need More Power?

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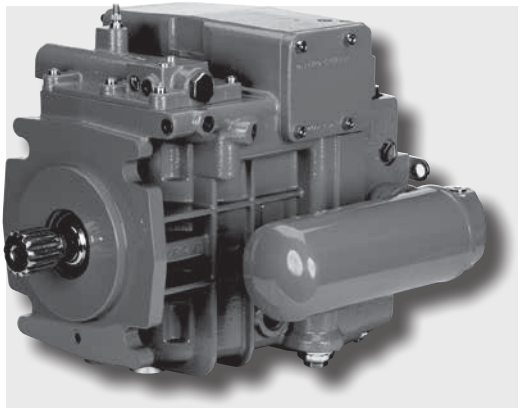

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Powering Business Worldwide

For power when you need it.

Mining and aggregate applications require continuous operation in demanding, power-hungry jobs. You need power and performance. Get both with Eaton's 760 Series pumps and motors.

- Robust design
- Multiple, fast-acting controls
- Wide range of fluid capabilities, including water-glycol
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