Load Control Valves

Counterbalance, Vented Counterbalance and Motion Control Valve Packages for applications up to 350 bar (5000 psi) and 190 L/min (50 USgpm)
### Load Control Valves

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<th>Rated Flow l/min (USgpm)</th>
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<td>...........................................................</td>
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</tr>
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<td>MCV4-16</td>
<td>210 (3000)</td>
<td>151 (40)</td>
<td>H-20</td>
</tr>
</tbody>
</table>

**Note**

Pilot operated check valves are covered in Section G.
Load control valves
Eaton offers a broad range of Vickers load control valving including counterbalance, motion control and pilot operated check valves. The prime function of load controls is to prevent loads from running ahead of pump supply and/or to provide positive load holding. These valves provide precise and stable motion control. Load control valves are ideally suited for moving and positioning systems. These products include both screw-in cartridge and inline housing valves to meet the majority of load control requirements.

Load control application tips

3-ported counterbalance valves
These valves are used with an open center on/off directional valve for:
- Precise control of overrunning loads
- Protection from pump cavitation
- Preventing actuator from running ahead of the pump supply and
- Providing load holding and hose failure safety

Vented (4-ported) counterbalance valves
These valves are used for:
- Precise control of overrunning loads
- Regenerative cylinder circuits
- Meter-out control and providing load holding and hose failure safety with proportional control valves
- Pilot operated check valves
These valves are used:
- For position load locking
- As an alternative to counterbalance valves where neither the overrunning loads or release speed are factors in the application.
- Pilot operated check valves are covered in section G

Counterbalance cartridges, 3-ported
The CBV are single cartridge type counterbalance valves that have:
- A check feature allowing free flow in one direction
- A relief feature controlling flow in the other direction
- A pilot signal that overrides the relief setting providing the counterbalance function.

The CBV*–10 series products are capable of handling flows to up 60 L/min (15 USgpm) and pressures up to 350 bar (5000 psi).
The CBV*–12 series products are capable of handling flows up to 114 L/min (30 USgpm) and pressures up to 350 bar (5000 psi).

These valves are available with 4:1 and 10:1 pilot ratios. As a general rule, a low pilot ratio will provide better motion control and stability in systems with higher capacitance (spongy) and inductance (high inertial loads). A high pilot ratio improves the efficiency of a hydraulic system, but motion control stability may suffer.

The 3-ported counterbalance valves are offered with a wide variety of standard housings with SAE and BSPP port options. Aluminum and steel housings are available in the following styles:
- Inline single
- Inline dual
- Inline dual, with integral shuttle
- SAE 4-bolt, Code 61
- Close coupled, nipple mounted
- Gasket mounted single
- Gasket mounted dual
- Various bolt on manifolds for Eaton hydraulic motors

Vented counterbalance cartridges, 4-ported
The VCB1-10 and VCB1-12 are single cartridge type counterbalance valves that have:
- A check feature that allows free flow in one direction
- A relief feature that controls flow in the other direction and
- A pilot signal that overrides the relief setting, providing the counterbalance function.

The additional 4th port on this valve provides an external drain that makes the valve insensitive to back pressure at port 2, when the valve is piloted open. This is particularly useful in regenerative circuits, meter-out circuits, servo valves and proportional valves circuits. This valve is available with a 4:1 pilot ratio. The 4-ported counterbalance valve is offered with a wide variety of standard housings with SAE and BSPP port options.

NOTE: For applications where the flow rate will not exceed 37.8 L/min (10 USgpm) for VCB1–10 and 95 L/min (25 USgpm) for VCB1–12, the standard C-**–4 housing can be used. For applications over those flows or those that require a reduced pressure drop, housings with the slot feature or a C-***–4 cavity are required.

Aluminum and steel housings are available in the following styles:
- Inline single
- Inline dual
- Gasket mounted single

Motion control valves
These are inline housing type motion control or counterbalance valves that utilize separate cartridges to perform the counterbalance function as described in the 3-ported version. The 16 and 20 series valves are available in both single and dual functions. The 16 series is capable of handling flows up to 151 L/min (40 USgpm) and pressures up to 210 bar (3000 psi). The 20 series valves are capable of handling 190 L/min (50 USgpm) and pressures up to 210 bar (3000 psi). Both series offer a 10:1 pilot ratio.
Features and benefits of counterbalance & motion controls:

- Positive load holding in any position.
- Thermal expansion relief protection.
- Cartridge valves may be installed directly into cavities machined in the actuator body. This reduces the number of potential leak points and simplifies plumbing.
- Line mounting of single or dual functions can simplify installation of load control valves in many applications.
- Dual function models that can introduce low-pressure makeup flow to prevent cavitation can be line mounted in hydrostatic transmissions.
- When used with paired cylinders, counterbalance valves will help to balance the load by transferring part of the load from the heavily loaded cylinder to the less loaded cylinder.
- When used with an open center directional control valve, deceleration control can be provided.

Adjusting counterbalance cartridge valve pressure setting:

Counterbalance valves adjust in the opposite direction of other pressure control valves. Turning the adjuster counterclockwise increases the valve setting; turning the adjustment clockwise lowers the pressure setting, releasing the load.

1. Loosen the jam nut.
2. Turn the adjusting screw clockwise to reduce the pressure setting, or counterclockwise to increase the pressure setting.

Do not remove the spring wire from the adjusting screw.

3. Tighten the jam nut to secure the desired pressure setting.

NOTE CBV*-10 spring wire must not be removed. Removal will affect the minimum adjustment of the valve.

CAUTION
Care should be taken to ensure the load is supported by mechanical means when servicing or removing the cartridge valve.

CAUTION
Hydraulically released “dead-man” brakes should be used to lock static loads due to motor and cylinder leakage.

CAUTION
Counterbalance valves can be damaged by severe decompression shock. To help prevent shock damage, a restriction may be added between the cylinder and the counterbalance valve.

CAUTION
Counterbalance valves are not relief valves or energy-saving devices. Stability problems may be encountered when system operating pressure goes below 50 bar (700 psi).

Pilot operated check valves:

The POC*-10 and POC*-12 series of pilot-to-open check valves complement the CBV*-10 and CBV*-12 counterbalance cartridges and are physically interchangeable with them. The POC’s provide a low cost alternative to load control when the dynamics of neither overrunning loads nor load release speed are factors to be considered in the design of the hydraulic circuit for the load to be controlled.

The pilot-to-open valves positively lock a load from port 1 to port 2 until pilot pressure applied to port 3 is sufficient to unseat the valve. This then permits flow from port 1 to port 2. The load can also be released through means of an optional screw type override.

The POC*-10 covers flow up to 60 L/min (15 USgpm). The POC*-12 covers flow up to 114 L/min (30 USgpm). With infinite life qualification to a fatigue pressure rating of 310 bar (4500 psi), these POC valves are suitable for use in a broad range of load control applications with typical system operating pressures up to 350 bar (5000 psi). Tailoring of the circuit to gain energy savings while minimizing shock is obtained through the use of several standard cracking pressure ranges from 2,0 bar (30 psi) to 7 bar (100 psi). When anti-cavitation protection is required, the 0,30 bar (5 psi) spring should be used. For those applications where pilot pressure may not always be available, the valve can be ordered with an optional adjustable override.

Pilot-to-open valves are suitable for a wide range of applications including aerial work platforms, boom truck, machine tool and round bailer markets.

Pilot operated check valves are covered in section G.

Features and benefits of pilot operated check valves:

- Simple load holding device. Low cost alternative to more complex solutions when overrunning loads are not present and / or control of load release speed is not required.
- Provides high operational efficiency and low spring settings.
- Valves are offered with a wide variety of standard housings with SAE and BSPP port options in the following configurations:
  - Inline single
  - Inline dual
  - SAE, 4-bolt
  - Close coupled, nipple mounted
  - Gasket mounted single
  - Gasket mounted dual

These valves fit into C–*–3S cavities.

- Four standard cracking pressures permit energy savings, while tailoring the hydraulic system requirements to minimize shock.
- Unique dual spring design provides high operational efficiency and a low pressure spring option for effective anti-cavitation protection.
- Unique design provides compact package and low pressure drops that match or exceed current market expectations and provide for excellent repeatability and stability.
- 3:1 pilot ratio satisfies simple load holding application requirements, while providing smooth operation and longer operating life.
- Optional adjustable override releases the load for situations where pilot pressure is not always available.

WARNING
Do not use Pilot-to-open check valves in load holding applications where either overrunning loads are possible or load release speed is critical. Failure to observe these guidelines may result in bodily injury or damage to equipment.

WARNING
For pressure over 210 bar (3000 psi) use steel housings.
**Functional Symbols**

*load Control Valves*

**CBV cartridges in housings**

- **I** - Inline Mounted

  ![Diagram of CBV IINLINE Mounted](image)

- **B** - 4-Bolt Pad (Size 12 only)

  ![Diagram of CBV 4-Bolt Pad (Size 12 only)](image)

- **N** - Closed Coupled, Nipple Mounted

  ![Diagram of CBV Closed Coupled, Nipple Mounted](image)

- **D** - Dual Line Mounted

  ![Diagram of CBV Dual Line Mounted](image)

- **P** - Dual Gasket Mounted

  ![Diagram of CBV Dual Gasket Mounted](image)

- **H** - Dual, bolt on for H or T motor

  ![Diagram of CBV Dual, bolt on for H or T motor](image)

- **2K** - Dual, bolt on for 2000 series motor

- **M** - Dual Counterbalance Line Mounted w/Integral Shuttle

  ![Diagram of CBV Dual Counterbalance Line Mounted w/Integral Shuttle](image)

**VCB cartridges in housings**

- **I** - Inline Mounted

  ![Diagram of VCB IINLINE Mounted](image)

**POC cartridges in housings**

- **I** - Inline Mounted

  ![Diagram of POC IINLINE Mounted](image)

  ![Diagram of Pilot Operated Check Valve Data Sheets](image)

- **B** - 4-Bolt Pad (Size 12 only)

  ![Diagram of POC 4-Bolt Pad (Size 12 only)](image)

- **N** - Close Coupled, Nipple Mounted

  ![Diagram of POC Close Coupled, Nipple Mounted](image)

- **D** - Dual Line Mounted

  ![Diagram of POC Dual Line Mounted](image)

- **P** - Dual Gasket Mounted

  ![Diagram of POC Dual Gasket Mounted](image)

- **H** - Dual, bolt on for H or T motor

  ![Diagram of POC Dual, bolt on for H or T motor](image)

- **2K** - Dual, bolt on for 2000 series motor

- **M** - Dual Counterbalance Line Mounted w/Integral Shuttle

  ![Diagram of POC Dual Counterbalance Line Mounted w/Integral Shuttle](image)

**Functional Symbols**

*load Control Valves*
CBV1/2-10
Counterbalance valve

Description
The CBV*-10 is a 3-ported, externally piloted, screw-in cartridge type counterbalance valve.

Operation
The CBV counterbalance valve allows free flow from port 2 (inlet) to port 1 (load). Flow from port 1 to port 2 is blocked until either the predetermined pressure setting has been reached or sufficient pilot pressure has been applied to port 3 (pilot).

RATINGS AND SPECIFICATIONS
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49˚C (120˚F)

<table>
<thead>
<tr>
<th>Performance Data</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical application pressure (all ports)</td>
<td>350 bar (5000 psi)</td>
</tr>
<tr>
<td>Cartridge fatigue pressure (infinite life)</td>
<td>350 bar (5000 psi)</td>
</tr>
<tr>
<td>Rated flow</td>
<td>60 L/min (15 USgpm)</td>
</tr>
<tr>
<td>Cracking pressure @ 1 L/min (0.25 USgpm)</td>
<td>30 - 62-210 bar (900-3000 psi)</td>
</tr>
<tr>
<td>Internal leakage</td>
<td>5 drops/min. max. Port 1 to Port 2 @ 77% of crack pressure</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40˚ to 120˚C (-40˚ to 248˚F)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C-10-3S</td>
</tr>
<tr>
<td>Pilot ratio</td>
<td>4:1, 10:1</td>
</tr>
<tr>
<td>Fluids</td>
<td>All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.</td>
</tr>
<tr>
<td>Filtration</td>
<td>Cleanliness code 18/16/13</td>
</tr>
<tr>
<td>Standard housing materials</td>
<td>Aluminum or steel</td>
</tr>
<tr>
<td>Weight cartridge only</td>
<td>0.23 kg. (0.50 lbs.)</td>
</tr>
<tr>
<td>Seal kit</td>
<td>02-173019 Buna-N 02-173020 Viton®</td>
</tr>
</tbody>
</table>

Viton is a registered trademark of E.I. DuPont

CAUTION
Adjustments exceeding 350 bar (5000 psi) may damage the body.

WARNING
For pressure over 210 bar (3000 psi) use steel housing.

Pressure Drop Curves
Cartridge only

For 4:1 Ratio
Pilot pressure, =
Cracking pressure + (5 x Port 2 pressure) - Port 1 pressure

For 10:1 Ratio
Pilot pressure, =
Cracking pressure + (11 x Port 2 pressure) - Port 1 pressure
**Valve function**

CBV - Counterbalance valve

**Pilot ratio**

1 - 4:1
2 - 10:1

**Valve size**

10 - Size 10

**Seals**

Blank - Buna-N
V - Viton

**Adjustment options**

S - Screw with locknut
C - Cap over screw
K - Hand knob

**Valve Body**

O - Cartridge only
I - Inline body
N - Close coupled, nipple mounting
G - Gasket mounted, single
D - Dual counterbalance, line mounted
M - Dual counterbalance, line mounted with integral shuttle valve
P - Dual counterbalance, gasket mounted
H - Dual counterbalance, bolt on manifold for H, S or T series motor
2K - Dual counterbalance, bolt on manifold for 2000 series motor

**Free flow crack pressure**

A - 1.4 bar (20 psi) (standard)
B - 0.28 bar (4 psi) (anti cavitation)
C - 1.4 bar (20 psi) with low leak poppet
D - 0.28 bar (4 psi) with low leak poppet

* Low leak poppet is only available on CBV2-**.

For housing part numbers and dimensions see section J.

**Pressure range**

30 - 62-210 bar (900-3000 psi)
50 - 186-350 bar (2700-5000 psi)

**Pressure setting (optional)**

(Specified by customer in 100 psi increments) for example:

20 - 140 bar (2000 psi)
35 - 240 bar (3500 psi)

**Special features**

00 - None
(Only required if valve has special features, omit if 00)

**Dimensions**

**“C” Adjustment (Cap over screw)**

Ø 31,75 (1.25) Nom.

61,7 (2.43) Nominal
65,6 (2.58) (Nominal full out)

**“K” Adjustment (Hand knob)**

12,7 (0.50) hex
25,4 (1.0) h ex
0.875”-14 Thd.

56,4 (2.18) Nominal full out

**“S” Adjustment (Screw w/locknut)**

Ø 17,4 (0.68 6)
Ø 19,0 (0.748)

**Note**

Turn screw or knob clockwise to reduce pressure setting and release load.

**Dimensions**

**CBV* – 10 (V) – * – * *** – * – ***/** – 00**

---

EATON Vickers Screw-in Cartridge Valves V-VLOV-MC001-E1 June 2003 H-7
**Description**

The CBV*-12 is a 3-ported, externally piloted, screw-in cartridge type counterbalance valve.

**Operation**

The counterbalance valve allows free flow from port 2 to port 1. Flow from port 1 to port 2 is blocked until either the predetermined pressure setting has been reached or sufficient pilot pressure has been applied to port 3 (pilot).

**RATINGS AND SPECIFICATIONS**

*Performance data is typical with fluid at 21,8 cSt (105 SUS) and 48˚C (120˚F)*

- Typical application pressure (all ports) 350 bar (5000 psi)
- Cartridge fatigue pressure (infinite life) 350 bar (5000 psi)
- Rated flow 114 L/min (30 USgpm)
- Cracking pressure @ 1 L/min (0.25 USgpm) 30 - 62-210 bar (900-3000 psi) 50 - 186-350 bar (2700-5000 psi)
- Internal leakage 5 drops/min. max. Port 1 to Port 2 @ 77% of crack pressure
- Temperature range -40˚ to 120˚C (-40˚ to 248˚F)
- Cavity C-12-3S
- Pilot ratio 4:1, 10:1
- Fluids All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration Cleanliness code 18/16/13
- Standard housing materials Aluminum or steel
- Weight cartridge only 0.36 kg. (0.79 lbs.)
- Seal kit 02-180095 Buna-N 02-165887 Viton®

*Viton is a registered trademark of E.I. Dupont*

**Pressure Drop Curves**

Cartridge only

**WARNING**

For pressure over 210 bar (3000 psi) use steel housing.

**CAUTION**

Adjustments exceeding 350 bar (5000 psi) may damage the body.

For 4:1 Ratio

Pilot pressure, =

Cracking pressure + (5 x Port 2 pressure) - Port 1 pressure

For 10:1 Ratio

Pilot pressure, =

Cracking pressure + (11 x Port 2 pressure) - Port 1 pressure
**Model Code**

**CBV1/2-12**

---

**CBV* – 12 (V) – * – * – * – * – * – * – ** – 00**

---

1. **Valve function**
   - CBV - Counterbalance valve

2. **Pilot ratio**
   - 1 - 4:1
   - 2 - 10:1

3. **Valve size**
   - 12 - Size 12

4. **Seals**
   - Blank - Buna-N
   - V - Viton

5. **Adjustment**
   - S - Screw with locknut
   - C - Cap over screw
   - K - Hand knob

6. **Valve body**
   - O - Cartridge only
   - I - Inline body
   - B - SAE 4 - Bolt pad
   - N - Close coupled, nipple mounting
   - G - Gasket mounted, single
   - D - Dual counterbalance, line mounted
   - M - Dual counterbalance, line mounted with integral shuttle valve
   - P - Dual counterbalance, gasket mounted

7. **Valve housing material**
   - A - Aluminum
   - S - Steel

---

**Dimensions**

**mm (inch)**

Torque cartridge in housing:

- A - 81-95 Nm (60-70 ft.lbs)
- S - 102-115 Nm (75-85 ft.lbs)

---

**Free flow crack pressure**

- A - 2.0 bar (25 psi) (standard)
- B - 0.30 bar (4 psi) (anti-cavitation)
- C - 1.4 bar (20 psi) with low leak poppet *
- D - 0.28 bar (4 psi) with low leak poppet *
  * Low leak poppet is only available on CBV2-**.
  Only apply B and D options if required in your application, these are not preferred options.
  CBV Valves should not be applied with closed center directional valves.

---

**Note**

Turn screw or knob clockwise to reduce pressure setting and release load.
VCB1-10
Vented counterbalance valve

Description
The VCB1-10 is a 4-ported, externally piloted, screw-in cartridge type counterbalance valve with the separate vent. This separate vent makes the valve insensitive to back pressure at port 2.

Operation
The VCB1-10 counterbalance valve will allow free flow from port 2 to port 1 through a built-in check valve. Flow from port 1 to port 2 is blocked until either a predetermined pressure setting has been reached or sufficient pilot pressure has been sensed on port 3 (pilot). Port 4 is vented to tank.

RATINGS AND SPECIFICATIONS
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 48°C (120°F)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical application pressure (all ports)</td>
<td>350 bar (5000 psi)</td>
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<tr>
<td>Cartridge fatigue pressure (infinite life)</td>
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<tr>
<td>Rated flow</td>
<td>60 L/min (15 USgpm)</td>
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<tr>
<td>Cracking pressure @ 1 L/min (0.25 USgpm)</td>
<td>30 - 62-210 bar (900-3000 psi)</td>
</tr>
<tr>
<td></td>
<td>50 - 180-350 bar (2700-5000 psi)</td>
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<tr>
<td>Internal leakage</td>
<td>5 drops/min. max. Port 1 to Port 2 @ 77% of crack pressure</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40° to 120°C (-40° to 248°F)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C-10-4 or C-10-4U</td>
</tr>
<tr>
<td>Pilot ratio</td>
<td>4:1</td>
</tr>
<tr>
<td>Fluids</td>
<td>All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.</td>
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<tr>
<td>Filtration</td>
<td>Cleanliness code 18/16/13</td>
</tr>
<tr>
<td>Standard housing materials</td>
<td>Aluminum or steel</td>
</tr>
<tr>
<td>Weight cartridge only</td>
<td>0,36 kg. (0.79 lbs.)</td>
</tr>
<tr>
<td>Seal kit</td>
<td>889625 Buna-N, 566080 Viton®</td>
</tr>
</tbody>
</table>

Viton is a registered trademark of E.I. Dupont

Pressure Drop Curves
Cartridge only

**WARNING**
For pressure over 210 bar (3000 psi) use steel housing.

**CAUTION**
Adjustments exceeding 350 bar (5000 psi) may damage the body.

Note
Valve should be set 1.3 times load induced pressure.

For 4:1 Ratio
\[
\text{Pilot pressure} = \frac{\text{Crack pressure} – \text{Load pressure}}{4} 
\]

- **A** - Piloted open port 1 to port 2
- **B** - Free flow port 2 to port 1
Valve function
VCB - Vented counterbalance valve

Pilot ratio
1 - 4:1

Valve size
10 - Size 10

Seals
Blank - Buna-N
V - Viton

Adjustment
S - Screw with locknut
C - Cap over screw
K - Hand knob

Valve body
O - Cartridge only
I - Inline body
G - Gasket mounted, single
D - Dual counterbalance, line mounted

Dimensions
mm (inch)
Torque cartridge in housing:
A - 47-54 Nm (35-40 ft.lbs)
S - 68-75 Nm (50-75 ft.lbs)

Note
Turn screw or knob clockwise to reduce pressure setting and release load.

Housing port sizes

<table>
<thead>
<tr>
<th>PORT SIZE</th>
<th>VALVE BODY CODES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I Alum.</td>
</tr>
<tr>
<td>SAE 6</td>
<td>A6H*</td>
</tr>
<tr>
<td>SAE 8</td>
<td>A8H**</td>
</tr>
<tr>
<td>SAE 10</td>
<td>A10H**</td>
</tr>
<tr>
<td>1/4&quot; BSPP</td>
<td>A2G</td>
</tr>
<tr>
<td>3/8&quot; BSPP</td>
<td>A3G**</td>
</tr>
</tbody>
</table>

* Light Duty Housing is available, to specify, substitute H with T respectively.
** Housings with slot.
Note - for housing part numbers and dimensions see section J.

Free flow crack pressure
A - 1.4 bar (20 psi) (standard)
B - 0.28 bar (4 psi) (anti-cavitation)

Pressure range
30 - 62-210 bar (900-3000 psi)
50 - 186-350 bar (2700-5000 psi)

Pressure setting (optional)
(Specified by customer in 100 psi increments) for example:
20 - 140 bar (2000 psi)
35 - 240 bar (3500 psi)

Special features
00 - None
(Only required if valve has special features, omit if 00)
**Description**

The VCB1-12 is a 4-ported, externally piloted, screw-in cartridge type counterbalance valve with the separate vent. This separate vent makes the valve insensitive to back pressure at port 2.

**Operation**

The VCB1-12 counterbalance valve will allow free flow from port 2 to port 1 through a built in check valve. Flow from port 1 to port 2 is blocked until either a predetermined pressure setting has been reached or sufficient pilot pressure has been sensed on port 3 (pilot). Port 4 is vented to tank.

**RATINGS AND SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical application pressure (all ports)</td>
</tr>
<tr>
<td>Cartridge fatigue pressure (infinite life)</td>
</tr>
<tr>
<td>Rated flow</td>
</tr>
<tr>
<td>Cracking pressure @ 1 L/min (0.25 USgpm)</td>
</tr>
<tr>
<td>50 - 175-350 bar (2500-5000 psi)</td>
</tr>
<tr>
<td>Internal leakage</td>
</tr>
<tr>
<td>Temperature range</td>
</tr>
<tr>
<td>Cavity</td>
</tr>
<tr>
<td>Pilot ratio</td>
</tr>
<tr>
<td>Fluids</td>
</tr>
<tr>
<td>Filtration</td>
</tr>
<tr>
<td>Standard housing materials</td>
</tr>
<tr>
<td>Weight cartridge only</td>
</tr>
<tr>
<td>Seal kit</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*Viton is a registered trademark of E.I. Dupont*

**Pressure Drop Curves**

Cartridge only

**WARNING**

For pressure over 210 bar (3000 psi) use steel housing.

**CAUTION**

Adjustments exceeding 350 bar (5000 psi) may damage the body.

Note

Valve should be set 1.3 times load induced pressure.
### Model Code

**VCB1-12**

#### Valve function
- **VCB** - Vented counterbalance valve

#### Pilot ratio
- 1 - 4:1

#### Valve size
- 12 - Size 12

#### Seals
- **Blank** - Buna-N
- **V** - Viton

#### Adjustment
- **S** - Screw with locknut
- **C** - Cap over screw
- **K** - Hand knob

#### Valve Body
- **O** - Cartridge only
- **I** - Inline body
- **G** - Gasket mounted, single
- **D** - Dual counterbalance, line mounted

#### Free flow crack pressure
- **A** - 1.7 bar (25 psi) (standard)
- **B** - 0.28 bar (4 psi) (anti-cavitation)

#### Pressure range
- **30** - 25-210 bar (500-3000 psi)
- **50** - 175-350 bar (2700-5000 psi)

#### Pressure setting
- **11** - None
- **10** - 140 bar (2000 psi)
- **9** - 240 bar (3500 psi)

#### Special features
- **00** - None
- **11** - None

---

### Dimensions

**mm (inch)**

**Torque cartridge in housing:**
- **A** - 81-95 Nm (60-70 ft.lbs)
- **S** - 102-115 Nm (75-85 ft.lbs)

**Pressure range**
- **30** - 25-210 bar (500-3000 psi)
- **50** - 175-350 bar (2700-5000 psi)

**Pressure setting**
- **11** - None
- **10** - 140 bar (2000 psi)
- **9** - 240 bar (3500 psi)

**Special features**
- **00** - None
- **11** - None

**Note**
- Turn screw or knob clockwise to reduce pressure setting and release load.

---

### Housing port sizes

<table>
<thead>
<tr>
<th>PORT SIZE</th>
<th>VALVE BODY CODES</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE 8</td>
<td>A8T** S8T**</td>
</tr>
<tr>
<td>SAE 10</td>
<td>A10T S10T</td>
</tr>
<tr>
<td>SAE 12</td>
<td>A12T** S12T**</td>
</tr>
<tr>
<td>3/8&quot; BSPP</td>
<td>A4G** S4G**</td>
</tr>
<tr>
<td>1/2&quot; BSPP</td>
<td>A4G** S4G**</td>
</tr>
</tbody>
</table>

**Note**
- For housing part numbers and dimensions see section J*

---

**“K” Adjustment**
- Ø 31.75

**“C” Adjustment**
- 12.7 (0.50) hex

**“S” Adjustment**
- 4.0 (0.16) hex

**Dimensions**
- Ø 20.57 (0.810)
- Ø 22.17 (0.873)
- Ø 23.75 (0.935)
**Description**

The MCV1-16 is an inline housing type motion control or load holding valve. This valve controls a moving load and prevents loads from running ahead of a pump. It will also lock or hold a load in any position and provides for thermal expansion relief.

**Operation**

The MCV1-16 is an inline housing type motion control or load holding valve. This valve controls a moving load and prevents loads from running ahead of a pump. It will also lock or hold a load in any position and provides for thermal expansion relief.

**RATINGS AND SPECIFICATIONS**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49˚C (120˚F)*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical application pressure (all ports)</td>
<td>210 bar (3000 psi)</td>
</tr>
<tr>
<td>Rated flow</td>
<td>151 L/min (40 USgpm)</td>
</tr>
<tr>
<td>Free flow cracking pressure @ 1 L/min (0.25 USgpm)</td>
<td>13 - 3.4-8.4 bar (50-1300 psi)</td>
</tr>
<tr>
<td></td>
<td>35 - 13.6-240 bar (200-3500 psi)</td>
</tr>
<tr>
<td>Internal leakage Port “C” to “V”</td>
<td>less than 5 drops/min. max. @ 210 bar (3000 psi)</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40˚ to 120˚C (-40˚ to 248˚F)</td>
</tr>
<tr>
<td>Pilot ratio</td>
<td>11:1</td>
</tr>
<tr>
<td>Fluids</td>
<td>All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.</td>
</tr>
<tr>
<td>Filtration</td>
<td>Cleanliness code 18/16/13</td>
</tr>
<tr>
<td>Standard housing material</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Weight</td>
<td>4.50 kg. (10.00 lbs.)</td>
</tr>
<tr>
<td>Seal kits (Check valve)</td>
<td>565810 Buna-N</td>
</tr>
<tr>
<td></td>
<td>889609 Viton®</td>
</tr>
<tr>
<td>Seal kits (Relief valve)</td>
<td>565810 Buna-N</td>
</tr>
<tr>
<td></td>
<td>889609 Viton®</td>
</tr>
</tbody>
</table>

*Viton is a registered trademark of E.I. Dupont*

**Pilot pressure calculation for 11:1 Ratio**

Nominal pressure to open valve by remote control

Pilot pressure = Cracking pressure + (12 x Port V pressure) - Port C pressure

\[
\text{Pilot pressure} = \text{Cracking pressure} + (12 \times \text{Port V pressure}) - \text{Port C pressure}
\]

**Pressure Drop Curves**

- **Free Flow (V to C)**
  - Flow – L/min (21.8 cSt oil @ 49˚C)
  - Pressure Drop – psi
  - Pressure Drop – bar

- **Piloted Open (C to V)**
  - Flow – L/min (21.8 cSt oil @ 49˚C)
  - Pressure Drop (psi)
  - Pressure Drop (bar)
Model Code

MCV1-16

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCV1-16</td>
<td>Motion control valve</td>
</tr>
<tr>
<td>CV1-16-P-0-5</td>
<td>Screw-in Cartridge Valves V-VLOV-MC001-E1 June 2003</td>
</tr>
<tr>
<td>RV3-16-S</td>
<td>Eaton Vickers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot</td>
<td>SAE 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installation</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque cartridge in housing</td>
<td>108-122 Nm (80-90 ft.lbs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Valve Function</th>
<th>Seals</th>
<th>Port size</th>
<th>Pressure setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCV1</td>
<td>Blank: “Buna-N”</td>
<td>12T: SAE 12 (light duty)</td>
<td>Optional - specify in 100 psi ranges. If not specified, set at:</td>
</tr>
<tr>
<td></td>
<td>V: “Viton”</td>
<td>6B: 3/4&quot; BSPP (light duty)</td>
<td>20: 140 bar (2000 psi)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Cracking pressure range</th>
<th>Special features</th>
</tr>
</thead>
<tbody>
<tr>
<td>K: Hand knob</td>
<td>13: 3.4-8.4 bar (50-1300 psi)</td>
<td>00: None</td>
</tr>
<tr>
<td>S: Screw with locknut</td>
<td>35: 13.6-240 bar (200-3500 psi)</td>
<td>(Only required if valve has special features, omit if 00)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seals</th>
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<th>Pressure setting</th>
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<td>12T: SAE 12 (light duty)</td>
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</tr>
<tr>
<td>CV1-16-P-0-5</td>
<td>V: “Viton”</td>
<td>6B: 3/4&quot; BSPP (light duty)</td>
<td>20: 140 bar (2000 psi)</td>
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<td>6B: 3/4&quot; BSPP (light duty)</td>
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<tr>
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<tbody>
<tr>
<td>RV3-16-S</td>
<td>Blank: “Buna-N”</td>
<td>12T: SAE 12 (light duty)</td>
<td>Optional - specify in 100 psi ranges. If not specified, set at:</td>
</tr>
<tr>
<td>CV1-16-P-0-5</td>
<td>V: “Viton”</td>
<td>6B: 3/4&quot; BSPP (light duty)</td>
<td>20: 140 bar (2000 psi)</td>
</tr>
</tbody>
</table>
**Description**
The MCV1-20 is an inline housing type motion control or load holding valve. This valve controls a moving load and prevents loads from running ahead of a pump. It will also lock or hold a load in any position and provides for thermal expansion relief.

**Operation**
This valve allows free flow from the "V" port to the "C" port and blocks flow in the opposite direction until either the relief setting is reached or until sufficient pilot pressure has been applied to the "Pilot" port.

**RATINGS AND SPECIFICATIONS**
*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49˚C (120˚F)*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical application pressure (all ports)</td>
<td>210 bar (3000 psi)</td>
</tr>
<tr>
<td>Rated flow</td>
<td>190 L/min (50 USgpm)</td>
</tr>
<tr>
<td>Free flow cracking pressure @ 1 L/min (0.25 USgpm)</td>
<td>13 - 3.4-8.4 bar (50-1300 psi)</td>
</tr>
<tr>
<td></td>
<td>35 - 13.6-240 bar (200-3500 psi)</td>
</tr>
<tr>
<td>Internal leakage</td>
<td>Port &quot;C&quot; to &quot;V&quot; less than 5 drops/min. max. @ 210 bar (3000 psi)</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40˚ to 120˚C (-40˚ to 248˚F)</td>
</tr>
<tr>
<td>Pilot ratio</td>
<td>10:1</td>
</tr>
<tr>
<td>Fluids</td>
<td>All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.</td>
</tr>
<tr>
<td>Filtration</td>
<td>Cleanliness code 18/16/13</td>
</tr>
<tr>
<td>Standard housing material</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Weight</td>
<td>5.40 kg. (12.00 lbs.)</td>
</tr>
<tr>
<td>Seal kits (Check valve)</td>
<td>889615 Buna-N</td>
</tr>
<tr>
<td></td>
<td>889619 Viton®</td>
</tr>
<tr>
<td>Seal kits (Relief valve)</td>
<td>565810 Buna-N</td>
</tr>
<tr>
<td></td>
<td>889609 Viton®</td>
</tr>
</tbody>
</table>

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

**Pressure Drop Curves**

**Free Flow (V to C)**

<table>
<thead>
<tr>
<th>Flow – L/min (21.8 cSt oil @ 49°C)</th>
<th>Pressure Drop – psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>120</td>
<td>60</td>
</tr>
<tr>
<td>160</td>
<td>40</td>
</tr>
<tr>
<td>200</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow – USgpm (105 SUS oil @120°F)</th>
<th>Pressure Drop – bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>60</td>
<td>6</td>
</tr>
</tbody>
</table>

**Piloted Open (C to V)**

<table>
<thead>
<tr>
<th>Flow – L/min (21.8 cSt oil @ 49°C)</th>
<th>Pressure Drop – psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>600</td>
</tr>
<tr>
<td>80</td>
<td>500</td>
</tr>
<tr>
<td>120</td>
<td>400</td>
</tr>
<tr>
<td>160</td>
<td>300</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow – USgpm (105 SUS oil @120°F)</th>
<th>Pressure Drop – bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
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<td>30</td>
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<td>40</td>
<td>40</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

**Pilot pressure calculation for 10:1 Ratio**

Nominal pressure to open valve by remote control

Pilot pressure =

\[
\frac{\text{Cracking pressure} + (11 \times \text{Port V pressure}) - \text{Port C pressure}}{10}
\]
### Model Code

**MCV1-20**

<table>
<thead>
<tr>
<th>Valve Function</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCV1</td>
<td>*</td>
<td>***</td>
<td>*</td>
<td>**</td>
<td>00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Valve Function**
  - MCV1 - Motion control valve

- **Adjustment**
  - K - Hand knob
  - S - Screw with locknut

- **Port size**
  - 16T - SAE 16 (light duty)
  - 8B - 1" BSPP (light duty)

- **Cracking pressure range**
  - 13 - 3,4-8,4 bar (50-1300 psi)
  - 35 - 13,6-240 bar (200-3500 psi)

- **Special features**
  - 00 - None
  
  (Only required if valve has special features, omit if 00)

### Installation Dimensions

<table>
<thead>
<tr>
<th><strong>mm (inch)</strong></th>
<th><strong>Installation Dimensions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque CV2-20 cartridge in housing 128-155 Nm (95-115 ft.lbs)</td>
<td></td>
</tr>
<tr>
<td>Torque RV3-16 cartridge in housing 108-122 Nm (80-90 ft.lbs)</td>
<td></td>
</tr>
</tbody>
</table>

### EATON Vickers Screw-in Cartridge Valves V-VLOV-MC001-E1 June 2003 H-17
**Description**

The MCV2-20 is a dual inline housing type motion control or load holding valve. This valve controls a moving load and prevents loads from running ahead of a pump. It will also lock or hold a load in any position and provides for thermal expansion relief.

**Functional Symbol**

![Functional Symbol](image)

**Sectional View**

![Sectional View](image)

**Operation**

This valve allows free flow from the “V” port to the “C” ports and blocks flow in the opposite direction until either the relief setting is reached or until sufficient pilot pressure has been applied from the opposite “V” port.

**RATINGS AND SPECIFICATIONS**

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

| Typical application pressure (all ports) | 210 bar (3000 psi) |
| Rated flow | 190 L/min (50 USgpm) |
| Free flow cracking pressure @ 1 L/min (0.25 USgpm) | 13 - 3.4-8.4 bar (50-1300 psi) |
| 35 - 13,6-240 bar (200-3500 psi) |
| Internal leakage, Port “C” to “V” | less than 5 drops/min. max. @ 210 bar (3000 psi) |
| Temperature range | -40°C to 120°C (-40°F to 248°F) |
| Pilot ratio | 10:1 |
| Fluids | All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc. |
| Filtration | Cleanliness code 18/16/13 |
| Standard housing material | Aluminum |
| Weight | 10.0 kg. (21.50 lbs.) |
| Seal kits (Check valve) | 889615 Buna-N |
| 889619 Viton® |
| Seal kits (Relief valve) | 565810 Buna-N |
| 889609 Viton® |

Viton is a registered trademark of E.I. Dupont

**Pilot pressure calculation for 10:1 Ratio**

Pilot pressure, nominal at port 3 =

\[ \text{Cracking pressure} + (11 \times \text{Port 2 pressure}) - \text{Port 1 pressure} \]

**Pressure Drop Curves**

**Free Flow**

(V1 to C1 or V2 to C2)

Flow – L/min (21.8 cSt oil @ 49°C)

![Pressure Drop Curve Free Flow](image)

**Piloted Open**

(C1 to V1 or C2 to V2)

Flow – L/min (21.8 cSt oil @ 49°C)

![Pressure Drop Curve Piloted Open](image)
### Model Code

**MCV2-20**

<table>
<thead>
<tr>
<th>Valve Function</th>
<th>Seals</th>
<th>Cracking pressure range</th>
<th>Special features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MCV2</strong> - Dual-motion control valve</td>
<td><strong>Blank</strong> - Buna-N</td>
<td>13 - 3.4-8.4 bar (50-1300 psi)</td>
<td>00 - None</td>
</tr>
<tr>
<td><strong>V</strong> - Viton®</td>
<td><strong>CV2-20</strong> cartridge in housing 128-155 Nm (95-115 ft.lbs)</td>
<td><strong>35</strong> - 13.6-240 bar (200-3500 psi)</td>
<td>(Only required if valve has special features, omit if 00)</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td><strong>Adjustment</strong></td>
<td><strong>Pressure setting</strong></td>
<td></td>
</tr>
<tr>
<td>20 - 20 Size</td>
<td><strong>K</strong> - Hand knob</td>
<td>Optional - specify in 100 psi ranges. If not specified, set at:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>S</strong> - Screw with locknut</td>
<td><strong>20</strong> - 140 bar (2000 psi)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Port size</strong></td>
<td><strong>35</strong> - 240 bar (3500 psi)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>20T</strong> - SAE 12 (light duty)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>8B</strong> - 1&quot; BSPP (light duty)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Installation Dimensions

**mm (inch)**
- Torque CV2-20 cartridge in housing 128-155 Nm (95-115 ft.lbs)
- Torque RV3-16 cartridge in housing 108-122 Nm (80-90 ft.lbs)

**Dimensions**

- Ø 0.375-16 x 50 deep 4 places
- 127.0 (5.00)
- 55.6 (2.19)
- 120.6 (4.75)

**C2**

**C1**

**RV3-16-S** (2 req'd)

**CV2-20-P** (2 req'd)

**V2**

**V1**

**H-19**

EATON Vickers Screw-in Cartridge Valves V-VLOV-MC001-E1 June 2003
**Description**
The MCV4-16 is a dual inline housing type motion control or load holding valve. This valve controls a moving load and prevents loads from running ahead of a pump. It will also lock or hold a load in any position and provides for thermal expansion relief and make-up oil.

**Functional Symbol**
![Functional Symbol](image)

**Sectional View**
![Sectional View](image)

**Operation**
This valve allows free flow from the “V” ports to the “C” ports and blocks flow in the opposite direction until either the relief setting is reached or sufficient pilot pressure has been applied from the opposite “V” port.

**Ratings and Specifications**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical application pressure (all ports)</td>
<td>210 bar (3000 psi)</td>
</tr>
<tr>
<td>Rated flow</td>
<td>151 L/min (40 USgpm)</td>
</tr>
<tr>
<td>Free flow cracking pressure @ 1 L/min (0.25 USgpm)</td>
<td>13 - 3.4, 8.4 bar (50-1300 psi)</td>
</tr>
<tr>
<td></td>
<td>35 - 13.6-240 bar (200-3500 psi)</td>
</tr>
<tr>
<td>Internal leakage Port “C” to “V” less than 5 drops/min. max. @ 210 bar (3000 psi)</td>
<td></td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40° to 120°C (-40° to 248°F)</td>
</tr>
<tr>
<td>Pilot ratio</td>
<td>11:1</td>
</tr>
<tr>
<td>Fluids</td>
<td>All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.</td>
</tr>
<tr>
<td>Cleanliness code</td>
<td>18/16/13</td>
</tr>
<tr>
<td>Standard housing material</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Weight</td>
<td>8.0 kg. (18 lbs.)</td>
</tr>
<tr>
<td>Seal kits (Check valve)</td>
<td>565810 Buna-N</td>
</tr>
<tr>
<td></td>
<td>889609 Viton®</td>
</tr>
<tr>
<td>Seal kits (Relief valve)</td>
<td>565810 Buna-N</td>
</tr>
<tr>
<td></td>
<td>889609 Viton®</td>
</tr>
</tbody>
</table>

Viton is a registered trademark of E.I. Dupont

**Pilot pressure calculation for 11:1 Ratio**
Nominal pressure to open valve by remote control
Pilot pressure =
Cracking pressure + (12 x Port V pressure) - Port C pressure

**Pressure Drop Curves**

**Free Flow**
(V1 to C1 or V2 to C2)

![Pressure Drop Curve](image)

**Piloted Open**
(C1 to V1 or C2 to V2)

![Pressure Drop Curve](image)
Model Code

MCV4 – 16 (V) – * – *** – **/** – 00

1. **Valve Function**
   
   MCV4 - Dual-motion control valve

2. **Seals**
   
   Blank - Buna-N
   V - Viton®

3. **Size**
   
   16 - 16 Size

4. **Adjustment**
   
   K - Hand knob
   S - Screw with locknut

5. **Port size**
   
   12T - SAE 12 (light duty)
   6B - 3/4" BSPP (light duty)

6. **Pressure setting**
   
   Optional - specify in 100 psi ranges. If not specified, set at:
   20 - 140 bar (2000 psi)
   35 - 240 bar (3500 psi)

7. **Special features**
   
   00 - None
   (Only required if valve has special features, omit if 00)

---

### Installation Dimensions

<table>
<thead>
<tr>
<th>Name</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RV3–16–S</td>
<td>103,9 (4.09)</td>
</tr>
<tr>
<td>CV1–16V–P–0–50</td>
<td>101,6 (4.00)</td>
</tr>
<tr>
<td>Tank</td>
<td>127,0 (5.00)</td>
</tr>
<tr>
<td>Ø 13,5 (0.531) mtg. holes</td>
<td>12,7 (0.50)</td>
</tr>
</tbody>
</table>

---

**Seals**

- Blank - Buna-N
- V - Viton®

**Adjustment**

- K - Hand knob
- S - Screw with locknut

**Port size**

- 12T - SAE 12 (light duty)
- 6B - 3/4" BSPP (light duty)

**Pressure setting**

Optional - specify in 100 psi ranges. If not specified, set at:

- 20 - 140 bar (2000 psi)
- 35 - 240 bar (3500 psi)

**Special features**

- 00 - None
  (Only required if valve has special features, omit if 00)

---

**Installation Dimensions**

Torque cartridge in housing
108-122 Nm (80-90 ft.lbs)