Logic Elements
Screw-in Cartridge Valves
Pressures to 290 bar (4200 psi) – Flows to 303 l/min (80 USgpm)
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Introduction

For over 70 years, Vickers has provided its customers with quality products and innovative solutions for all their power and motion control needs.

The products featured in this catalog represent the very best in screw-in cartridge logic element valve technology.

We are committed to maintaining this position by offering the most comprehensive range of cartridge valves for industrial and mobile equipment.

This catalog gives basic specifications for Vickers logic elements screw-in cartridge valves. Its purpose is to provide a quick, convenient reference tool when choosing Vickers cartridge valves or designing a system using these components.

All cartridges have hardened and ground poppets and sharp-edged ground steel seats. This provides an excellent product that is dirt-tolerant, has reliable seating, and is suitable for fast cycling with long life.

These Vickers cartridges provide the system designer with a versatile range of elements for use in MCD packages for controlling pressure, flow and direction.

The range includes:

- **Pressure compensators (hydrostats)**
- **Pressure compensators with priority and bypass outlets**
- **Differential–pressure sensing elements**
- **Flow modulated orifice cartridges**

The correct selection of these products can enhance machine performance, shorten the design process and minimize manufacturing costs of manifold blocks.

**Flow compensators (hydrostats) – PCS3**

An essential component of a pressure compensated flow control which, with an external fixed or variable orifice, provides the required compensated flow characteristic. Excess flow is diverted at maximum system pressure. Excess fluid upstream must be diverted e.g. through a relief to tank.

**Pressure compensator with priority and bypass outlets – PCS4**

Similar in function to the PCS3. The major difference is that excess flow is diverted at priority flow pressure, instead of at maximum system pressure, as is the case with PCS3 compensators. The excess flow can pass to a secondary circuit or to tank.

**Flow modulated orifice cartridges – MOS1**

The MOS1 cartridges are used as modulated orifices.

These cartridges are particularly effective when used with an external pressure compensator (hydrostat) such as a PCS3 or PCS4 type. The PCS3 provides normal pressure compensation. The PCS4 provides pressure compensation for priority flow arrangements.

The low pilot pressure required allows proportional control when used with an EPV2 proportional pilot relief.

**Differential–pressure sensing elements – DPS2**

For controlling pressure, flow or direction (including 3- and 4-way bridge circuits) the DPS2 is used with the aid of external pilot operators. The DPS2 elements are function building blocks which respond to pressure differential signals, providing the capacity to switch or modulate flows up to 303 l/min (80 USgpm) and pressure to 350 bar (5000 psi).

The choice of pilot arrangements related to DPS2 variants can minimize the number of construction holes in a manifold, simplifying design and reducing costs.
Application Examples

Pressure control functions
Pressure relief or Sequence example
*With external pilot supply and pilot relief*

Pressure relief or Sequence example, normally open
*With internal pilot supply and pilot relief*

Pressure reducing example
*Non-relieving type*
Flow control functions

Pressure compensated flow control example
*With downstream fixed or variable control*

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<table>
<thead>
<tr>
<th>DPS2-**-F differential pressure sensing cartridge</th>
<th>Fixed or variable restrictor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uni-directional flow</td>
<td></td>
</tr>
</tbody>
</table>

---

Pressure compensated flow control example
*With electrohydraulic proportional control downstream*

---

<table>
<thead>
<tr>
<th>DPS2-**-F differential pressure sensing cartridge</th>
<th>MOS1-** modulating orifice</th>
<th>ERV2-10 proportional pilot relief valve</th>
<th>Uni-directional flow</th>
</tr>
</thead>
</table>

---

Pressure compensated flow control example
*With electrohydraulic proportional control upstream*

---

<table>
<thead>
<tr>
<th>MOS1-** modulating orifice</th>
<th>PCS3-** pressure compensator</th>
<th>ERV2-10 proportional pilot relief valve</th>
<th>Uni-directional flow</th>
</tr>
</thead>
</table>
Flow control functions
Pressure compensated priority flow control example
With fixed or variable priority flow control

Pressure compensated priority flow control example
Form A

Pressure compensated priority flow control example
Form B
Flow control functions
Load sensing priority flow control example
*With pressure limiting and venting*

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Load sensing priority flow control example
*Double acting version with pressure limiter*
Directional control functions
Two-way, two-position, normally open examples
2-way, 2-position, normally open
Switched by 3-way, 2-position pilot valve
and external pilot pressure

With DPS2-**-V cartridge and internal pilot supply
DPS2-**-V differential pressure sensing cartridge

Uni-directional flow

With DPS2-**-B cartridge and internal pilot supply
DPS2-**-B differential pressure sensing cartridge

Uni-directional flow

With DPS2-**-S cartridge and internal pilot supply
DPS2-**-S differential pressure sensing cartridge

Uni-directional flow

With DPS2-**-T cartridge and internal shuttle-selected pilot supply
DPS2-**-T differential pressure sensing cartridge

Bi-directional flow

With DPS2-**-T cartridge, external pilot supply and two-way two-position pilot directional valve
DPS2-**-T differential pressure sensing cartridge

Bi-directional flow
### Three-way bridge circuits

**Form 1, with DPS2-**-T**
Differential pressure sensing cartridges

**Form 2, with DPS2-**-P**
Differential pressure sensing cartridges

**Form 3, with DPS2-**-P**
Differential pressure sensing cartridges

<table>
<thead>
<tr>
<th>Required Flow Path</th>
<th>Pilot Pressure to</th>
<th>Available from example</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA</td>
<td>PB</td>
<td>1 2 3</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>Yes Yes No</td>
</tr>
</tbody>
</table>

1 – Pressure Applied 0 – Pressure Vented

**NOTE:** Pilot pressure, modified by valve area ratio (if any), must exceed load pressure at valve in order to close valve.

### Four-way bridge circuits

**With DPS2-**-T**
Differential pressure sensing cartridges

**With DPS2-**-P**
Differential pressure sensing cartridges

<table>
<thead>
<tr>
<th>Required Flow Path</th>
<th>Pilot Pressure to</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>P2 P3 P4 P5</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>

1 – Pressure Applied 0 – Pressure Vented

**NOTE:** Pilot pressure, modified by valve area ratio (if any), must exceed load pressure at valve in order to close valve.
**PCS3-10**

**Pressure compensator**

**Functional Symbol**

The PCS3-10 is a screw-in, pressure compensator (hydrostat) cartridge.

**Description**

This valve, when used with either a fixed or variable orifice between port 1 and port 3, maintains a constant flow. This is based on whatever pressure differential is chosen. Flow out of port 2, regardless of pressure, changes downstream on port 2.

**Operation**

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)
- Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
- Rated flow ............................................. 38 l/min (10 USgpm)
- Cavity .................................................. C-10-3 (See page 34)
- Temperature range .......................... -40 to 120° C (-40° to 248° F)
- Fluids ........................................ All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.

Filtration .................................................. Cleanliness code 18/16/13
- Weight cartridge only ................................. 0.12 kg. (0.26 lbs.)
- Seal kits ........................................... 565812 Buna–N 889611 Viton®

**Performance Characteristics**

*Cartridge only*

Controlled flow in l/min 21.8 cSt oil @ 49° C

Controlled flow USgpm 105 SUS oil @ 120° F

A  Control Δp – 2.8 bar (40 psi)
B  Control Δp – 5.5 bar (80 psi)
C  Control Δp – 11.0 bar (160 psi)

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

**PCS3-10**

### Function

**PCS3** - Pressure compensator spool

### Size

10 – 10 Size

### Seals

**Blank** – Buna-N
**V** – Viton

### Port size

| 0 | Cartridge only
| 1 | Customized housings are necessary for close-coupling, compensator and orifice.

### Spool seals

**Blank** – No seal on spool
**S** – Seal on spool. For load holding applications where leakage from port 1 to 2 could cause cylinder drift, use of seal will increase hysteresis.

### Pressure differential (nominal)

| 40 | 2.8 bar (40 psi)
| 80 | 5.5 bar (80 psi)
| 160 | 11.0 bar (160 psi)

### Dimensions

**mm (inch)**

- **∅ 15,80 (0.622)**
- **∅ 17,40 (0.685)**
- **25,4 (1.00) hex**
- **Torque 47-54 Nm**
- **(35-40 lbf ft)**
- **19,0 (0.75)**
- **46,0 (1.81)**
- **0.875”-14 Thd.**

---

11
PCS3-16
Pressure compensator

### Functional Symbol

The PCS3-16 is a screw-in, pressure compensator (hydrostat) cartridge.

### Operation

This valve, when used with either a fixed or variable orifice between port 1 and port 3, maintains a constant flow. This is based on whatever pressure differential is chosen. Flow out of port 2, regardless of pressure, changes downstream on port 2.

### 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)
- **Cartridge fatigue pressure (infinite life)**: 210 bar (3000 psi)
- **Rated flow**: 114 l/min (30 USgpm)
- **Cavity**: C-16-3 (See page 34)
- **Standard housing materials**: Customized housings are necessary for close-coupling, the compensator and orifice.
- **Temperature range**: -40°C to 120°C (-40°F to 248°F)
- **Fluids**: All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- **Filtration**: Cleanliness code 18/16/13
- **Weight cartridge only**: 0,38 kg. (0.84 lbs.)
- **Seal kits**: 565811 Buna–N

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

### Performance Characteristics

*Cartridge only*

- **Controlled flow in l/min 21,8 cSt oil @ 49°C**

<table>
<thead>
<tr>
<th>Controlled flow USgpm 105 SUS oil @ 120°F</th>
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<tbody>
<tr>
<td>0</td>
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<tr>
<td>---</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>0.050</td>
</tr>
</tbody>
</table>

- **Approx. orifice diameter**
  - **A**: Control Δp – 2,8 bar (40 psi)
  - **B**: Control Δp – 5,5 bar (80 psi)
  - **C**: Control Δp – 11,0 bar (160 psi)
### Model Code

**PCS3-16**

### PCS3 - 16 (V) - * - (S) - ***

<table>
<thead>
<tr>
<th>1</th>
<th>Function</th>
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<tr>
<td>PCS3</td>
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</tbody>
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<table>
<thead>
<tr>
<th>2</th>
<th>Size</th>
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<tr>
<td>16 – 16</td>
<td>Size</td>
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</tbody>
</table>

<table>
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<tr>
<th>3</th>
<th>Seals</th>
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</thead>
<tbody>
<tr>
<td>Blank</td>
<td>Buna-N</td>
</tr>
<tr>
<td>V</td>
<td>Viton</td>
</tr>
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<table>
<thead>
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<th>4</th>
<th>Port size</th>
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<tbody>
<tr>
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<td>Cartridge only</td>
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</tbody>
</table>

Customized housings are necessary for close-coupling, compensator and orifice.

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<tr>
<td>80 – 5.5 bar (80 psi)</td>
<td></td>
</tr>
<tr>
<td>160 – 11.0 bar (160 psi)</td>
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<table>
<thead>
<tr>
<th>6</th>
<th>Spool seals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank</td>
<td>No seal on spool</td>
</tr>
<tr>
<td>S</td>
<td>Seal on spool. For load holding applications where leakage from port 1 to 2 could cause cylinder drift, use of seal will increase hysteresis.</td>
</tr>
</tbody>
</table>

### Dimensions

**mm (inch)**

![Diagram](image-url)

- 28.6 (1.12)
- 73.0 (2.87)
- ∅ 26.95 (1.061)
- ∅ 28.55 (1.124)
- 38.1 (1.50) hex
- Torque 47-54 Nm (35-40 lbf ft)
- 1.312”-12 Thd.
The PCS3-20 is a screw-in, pressure compensator (hydrostat) cartridge.

This valve, when used with either a fixed or variable orifice between port 1 and port 3, maintains a constant flow. This is based on whatever pressure differential is chosen. Flow out of port 2, regardless of pressure, changes downstream on port 2.

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)
- Cartridge fatigue pressure (infinite life) ........ 210 bar (3000 psi)
- Rated flow .............................................. 189 l/min (50 USgpm)
- Cavity ................................................. C-20-3 (See page 34)
- Standard housing materials .......................... Customized housings are necessary for close-coupling, the compensator and orifice.
- Temperature range .................................... -40° to 120°C (-40° to 248°F)
- Fluids ...................................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration .................................................. Cleanliness code 18/16/13
- Weight cartridge only .................................. 0.88 kg. (1.94 lbs.)
- Seal kits ................................................. 889616 Buna–N

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**Controlled flow in l/min 21.8 cSt oil @ 49°C**

**Controlled flow USgpm 105 SUS oil @ 120°F**

A  Control Δp – 2.8 bar (40 psi)
B  Control Δp – 5.5 bar (80 psi)
**Model Code**

**PCS3-20**

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**PCS3 -20 (V) - * - (S) - ***

1 2 3 4 5

1. **Function**
   - PCS3—Pressure compensator spool

2. **Size**
   - 20 – 20 Size

3. **Seals**
   - Blank—Buna—N
   - V – Viton

4. **Port size**
   - 0 – Cartridge only
   - Customized housings are necessary for close-coupling, compensator and orifice.

5. **Spool seals**
   - Blank – No seal on spool
   - S – Seal on spool. For load holding applications where leakage from port 1 to 2 could cause cylinder drift, use of seal will increase hysteresis.

6. **Pressure differential (nominal)**
   - 80 – 5.5 bar (80 psi)
   - 160–11.0 bar (160 psi)

---

**Dimensions**

**mm (inch)**

![Dimensions Diagram]

- 1.625”-12 Thd.
- 47.6 (1.87) hex
- Torque 129-156 Nm
  - (95-115 lbf ft)
- 33.30 (1.311)
- 36.47 (1.436)
- 98.4 (3.87)
- 41.3 (1.62)
PCS4-10
Pressure compensator

### Functional Symbol

![Functional Symbol Diagram]

### Description

The PCS4-10 is a screw-in, pressure compensator (hydrostat) cartridge for use as a bypass or priority flow control.

### Operation

This valve, when used with either a fixed or variable orifice on port 4, maintains a constant flow out port 3, regardless of pressure changes downstream of port 3. This is based on whatever pressure differential is chosen. All flow in excess of the priority requirement is bypassed from port 1 to port 2. If the priority port is deadheaded, the valve will try to direct flow out of the priority port and shut off the bypass flow, blocking off all flow.

### 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)
- **Cartridge fatigue pressure (infinite life)**: 210 bar (3000 psi)
- **Rated flow**: 38 l/min (10 USgpm)
- **Cavity**: C-10-4 (See page 35)
- **Standard housing materials**: Customized housings are necessary for close-coupling, the compensator and orifice.
- **Temperature range**: -40°C to 120°C (-40°F to 248°F)
- **Fluids**: All general purpose hydraulic fluids such as MIL–H–5606, SAE 10, SAE 20, etc.
- **Filtration**: Cleanliness code 18/16/13
- **Weight cartridge only**: 0.14 kg (0.32 lbs.)
- **Seal kits**: 889651 Buna–N

### Performance Characteristics

**Cartridge only**

#### Controlled priority flow, port 3 in l/min 21.8 cSt oil @ 49°C

![Graph: Controlled priority flow, port 3 in l/min 21.8 cSt oil @ 49°C]

- **A** Control Δp – 2.8 bar (40 psi)
- **B** Control Δp – 5.5 bar (80 psi)
- **C** Control Δp – 11.0 bar (160 psi)

#### Controlled priority flow, port 3 USgpm 105 SUS oil @ 120°F

![Graph: Controlled priority flow, port 3 USgpm 105 SUS oil @ 120°F]
Model Code

PCS4-10

PCS4 - 10 (V) - * - ***

1 Function
PCS4 – Pressure compensator spool

2 Size
10 – 10 Size

3 Seals
Blank – Buna–N
V – Viton

4 Port size
0 – Cartridge only
Customized housings are necessary for close-coupling, compensator and orifice.

5 Pressure differential (nominal)
40 – 2.8 bar (40 psi)
80 – 5.5 bar (80 psi)
160 – 11.0 bar (160 psi)

Dimensions mm (in)

19,0 (0.75)

61,9 (2.43)

25,4 (1.00) hex
Torque 47-54 Nm
(35-40 lbf ft)

0.875”-14 Thd.

Ø 15,80 (0.622)
Ø 17,40 (0.685)
Ø 18,97 (0.747)
PCS4-16
Pressure compensator

Functional Symbol

Description
The PCS4-16 is a screw-in, pressure compensator (hydrostat) cartridge for use as a bypass or priority flow control.

Operation
This valve, when used with either a fixed or variable orifice on port 4, maintains a constant flow out port 3, regardless of pressure changes downstream of port 3. This is based on whatever pressure differential is chosen. All flow in excess of the priority requirement is bypassed from port 1 to port 2. If the priority port is deadheaded, the valve will try to direct flow out of the priority port and shut off the bypass flow, blocking off all flow.

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)
Cartridge fatigue pressure (infinite life) ................. 210 bar (3000 psi)
Rated flow ........................................... 114 l/min (30 USgpm)
Cavity ................................................. C-16-4 (See page 35)
Standard housing materials ............................. Customized housings are necessary for close-coupling, the compensator and orifice.
Temperature range ................................... -40°C to 120°C (-40°F to 248°F)
Fluids ..................................................... All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.
Filtration ............................................... Cleanliness code 18/16/13
Weight cartridge only .................................. 0.50 kg. (1.12 lbs.)
Seal kits .................................................. 889660 Buna–N 02–175435 Viton®

Viton is a registered trademark of E.I.DuPont

Performance Characteristics
Cartridge only

Controlled priority flow, port 3 in l/min 21.8 cSt oil @ 49°C

Controlled priority flow, port 3 USgpm 105 SUS oil @ 120°F

Approx. orifice diameter

A Control Δp – 2.8 bar (40 psi)
B Control Δp – 5.5 bar (80 psi)
C Control Δp – 11.0 bar (160 psi)
**Model Code**

PCS4-16

---

**PCS4 - 16 (V) - * - ***

<table>
<thead>
<tr>
<th>Function</th>
<th>Port size</th>
<th>Pressure differential (nominal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS4</td>
<td>0</td>
<td>Cartridge only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customized housings are necessary for close-coupling, compensator and orifice.</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>40 – 2.8 bar (40 psi)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>80 – 5.5 bar (80 psi)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>160 – 11.0 bar (160 psi)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Size**

16 – 16 Size

**Seals**

Blank – Buna–N

V – Viton

---

**Dimensions mm (in)**

- 28.6 (1.12)
- 101.6 (4.00)
- 38.1 (1.50) hex
- Torque 108-122 Nm (80-90 lbf ft)
- 1.312”-12 Thd.
- Ø 25.37 (0.999)
- Ø 26.95 (1.061)
- Ø 28.55 (1.124)
PCS4-20
Pressure compensator

Functional Symbol

Description
The PCS4-20 is a screw-in, pressure compensator (hydrostat) cartridge for use as a bypass or priority flow control.

Operation
This valve, when used with either a fixed or variable orifice on port 4, maintains a constant priority flow (based on the pressure differential chosen) out port 3, regardless of pressure changes downstream on port 3. All flow in excess of the priority requirement is bypassed from port 1 to port 2. If the priority port is deadheaded, the valve will try to direct flow out the priority port and shut off the bypass flow, blocking off all flow.

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)
Cartridge fatigue pressure (infinite life) ................................... 210 bar (3000 psi)
Rated flow ................................................................. 189 l/min (50 USgpm)
Cavity ................................................................. C-20-4 (See page 35)
Standard housing materials ........................................ Customized housings are necessary for close-coupling, the compensator and orifice.
Temperature range ........................................... -40°C to 120°C (-40°F to 248°F)
Fluids .................................................. All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.
Filtration .......................................................... Cleanliness code 18/16/13
Weight cartridge only .................................................... 0,50 kg. (1.12 lbs.)
Seal kits .......................................................... 889660 Buna–N 02–175435 Viton®

Viton is a registered trademark of E.I.DuPont

Performance Characteristics
Cartridge only

Controlled priority flow port 3, in l/min 21,8 cSt oil @ 49°C

Controlled priority flow port 3, USgpm 105 SUS oil @ 120°F

Approx. orifice diameter

| A | Control Δp – 2,8 bar (40 psi) |
| B | Control Δp – 5,5 bar (80 psi) |
Model Code

PCS4 - 20 (V) - * - ***

1 Function
PCS4 – Pressure compensator spool

2 Size
20 – 20 Size

3 Seals
Blank – Buna–N
V – Viton

4 Port size
0 – Cartridge only
Customized housings are necessary for close-coupling, compensator and orifice.

5 Pressure differential (nominal)
80 – 5.5 bar (80 psi)
160 – 11.0 bar (160 psi)

Dimensions mm (in)

41.3 (1.62)

47.6 (1.87) hex
Torque 129-156 Nm
(95-115 lbf ft)

1.625″-12 Thd.

139.7 (5.50)

∅ 31.70 (1.248)
∅ 33.30 (1.311)
∅ 36.47 (1.436)
**MOS1-10**

**Modulating orifice**

**Functional Symbol**

MOS1-**(V)-F    MOS1-**(V)-M

**Description**

The MOS1-10 is a spool type, pilot operated, screw-in, modulating orifice.

**Operation**

This valve is used in series with a PCS3 or PCS4 pressure compensator (hydrostat), and a suitable back pressure pilot valve connected to port 4. Modulated flow is pressure compensated out port 2.

**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)
- Cartridge fatigue pressure (infinite life) .............................................. 210 bar (3000 psi)
- Controlled flow range (port 3 to 2) ..................................................... 0–38 l/min (0–10 USgpm)
- Pilot pressure adjustment range .......................................................... 1.38–14 bar (20–200 psi)
- Cavity ......................................................... C-10-4 (See page 35)
- Standard housing materials ......... The essential close-coupling with a pressure compensator necessitates a customized housing to accommodate both cartridges.
- Temperature range .......................................................... -40 to 120°C (-40°F to 248°F)
- Fluids ................................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ................................................... Cleanliness code 18/16/13
- Weight cartridge only .......................................................... 0.50 kg. (1.12 lbs.)
- Seal kits ................................................... 889660 Buna–N 02–175435 Viton®

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

**Sectional View**

**Performance Characteristics**

Cartridge only

A  Control Δp – 16.5 bar (240 psi)
B  Control Δp – 11.0 bar (160 psi)
C  Control Δp – 5.5 bar (80 psi)
D  Control Δp – 2.8 bar (40 psi)
Model Code  MOS1-10

MOS1 - 10 (V) - * - 0 - 10

- Function
  MOS1 – Modulating orifice

- Size
  10 – 10 Size

- Seals
  Blank – Buna-N
  V – Viton

- Spool position adjustment
  F – Fixed
  M – Manual override

- Controlled flow range
  10 – 0-38 l/min (0-10 USgpm)

- Port size
  0 – Cartridge only

Dimensions mm (in)

“F” Adjustment

22.2 (0.87)

61.9 (2.43)

25.4 (1.00) hex
Torque 47-54 Nm
(35-40 lbf ft)

0.875"-14 Thd.

“M” Adjustment

57.2 (2.25)

∅ 15.82 (0.623)
∅ 17.42 (0.686)
∅ 19.00 (0.748)
MOS1-16
Modulating orifice

Functional Symbol
MOS1-**(V)-F  MOS1-**(V)-M

Description
The MOS1-16 is a spool type, pilot operated, screw-in, modulating orifice.

Operation
This valve is used to modulate flow from port 3 to port 2, proportional to a back pressure applied to pilot port 4. When used in series with a PCS3 or PCS4 pressure compensator (hydrostat), and a suitable back-pressure pilot valve connected to port 4, modulated flow is pressure compensated.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49° C (150° F)
Typical application pressure (all ports) 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) 210 bar (3000 psi)
Controlled flow range (port 3 to 2) 0 – 132 l/min (0 – 35 USgpm)
Pilot pressure adjustment range 1.38–14 bar (20–200 psi)
Cavity C-16-4 (See page 35)
Standard housing materials: The essential close-coupling with a pressure compensator necessitates a customized housing to accommodate both cartridges.

Temperature range -40 to 120° C (-40° to 248° F)
Fluids All general purpose hydraulic fluids such as:
MIL–H–5606, SAE 10, SAE 20, etc.
Filtration Cleanliness code 18/16/13
Weight cartridge only 0.52 kg. (1.14 lbs.)
Seal kits 889634 Buna–N
889638 Viton®

Performance Characteristics
Cartridge only

Pilot pressure, port 4 bar

Typical flow, from port 2

USgpm

Pilot pressure, port 4 psi

Typical flow, from port 2

A  Control Δp – 16.5 bar (240 psi)
B  Control Δp – 11.0 bar (160 psi)
C  Control Δp – 5.5 bar (80 psi)
D  Control Δp – 2.8 bar (40 psi)

Viton is a registered trademark of E.I. DuPont

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### MOS1 - 16 - (V) - * - 0 - 35

<table>
<thead>
<tr>
<th><strong>1</strong> Function</th>
</tr>
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<tbody>
<tr>
<td>MOS1 – Modulating orifice</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>2</strong> Size</th>
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<tbody>
<tr>
<td>16 – 16 Size</td>
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</table>

<table>
<thead>
<tr>
<th><strong>3</strong> Seals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank – Buna-N</td>
</tr>
<tr>
<td>V – Viton</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>4</strong> Spool position adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>F – Fixed</td>
</tr>
<tr>
<td>M – Manual override</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>5</strong> Controlled flow range</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 – 0-132 l/min (0-35 USgpm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Port size</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – Cartridge only</td>
</tr>
</tbody>
</table>

#### Dimensions mm (in)

- **“F” Adjustment**
  - 38.0 (1.50)
- **“M” Adjustment**
  - 57.2 (2.25)
- **1.312”-12 Thd.**
- **38.1 (1.50) hex Torque 108-122 Nm (80-90 lbf ft)**
- **Ø 25.37 (0.999)**
- **Ø 26.95 (1.061)**
- **Ø 28.55 (1.124)
**DPS2-10**  
**Differential pressure sensing valve**

**Description**

The DPS2-10 is a differential pressure sensing valve, available as either a spool or poppet type, vented or pilot operated.

**Operation**

This valve is used as a main section of a pilot controlled valve assembly. This valve has multiple uses when used with either directional control, flow control or pressure control cartridges. Refer to application examples in the front of this catalog.

**Ratings and specifications**

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

- Typical application pressure (spool type) 290 bar (4200 psi)  
  (poppet type) 240 bar (3500 psi)
- Rated flow 60 l/min (15 USgpm)
- Pilot ratio (spool type P, V, R, F) 1:1  
  (poppet type B, S, T) 2:1
- Internal leakage, poppet type Port 1 to 2: <5 drops/min. max. @350 bar (5000 psi)
- Internal leakage, spool type 82 cm³/min (5 in³/min.) max. @350 bar (5000 psi)
- Temperature range -40°C to 120°C (-40°F to 248°F)
- Cavity C-10-3S (See page 34)
- Standard housing materials Aluminum
- Fluids All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration Cleanliness code 18/16/13
- Weight cartridge only 0.14 kg. (0.30 lbs.)
- Seal kits 889650 Buna–N  
  889652 Viton®

Viton is a registered trademark of E.I. DuPont

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**Pressure Drop Curves**

Cartridge only

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**Functional Symbol**

DPS2-10(V)-B-S

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**Sectional View**

DPS2-10(V)-B-S
Model Code

**DPS2-10**

- **Function**
  - DPS2 – Differential pressure sensing

- **Size**
  - 10 – 10 Size

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

- **Function**
  - B – Poppet, vent to open, N/C
  - S – Poppet, vent to open, N/C
  - T – Poppet, Bi-directional, pilot to close, 2:1 ratio, N/C
  - P – Spool, N/C
  - V – Spool, N/C
  - R – Spool, pressure reducing, N/O
  - F – Spool, flow control, N/O

- **Port Size**
  - O – Cartridge only

- **Code**
<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
<td>3/8&quot; BSPP</td>
<td>02–175470</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>566413</td>
</tr>
<tr>
<td>6H</td>
<td>SAE 6</td>
<td>876706</td>
</tr>
<tr>
<td>8H</td>
<td>SAE 8</td>
<td>876712</td>
</tr>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>876707</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>876710</td>
</tr>
</tbody>
</table>

See page 36 for housings.

- **Differential pressure**
  - 5 – 0.35 bar (5 psi) +
  - 10 – 0.7 bar (10 psi) +
  - 20 – 1.4 bar (20 psi) +
  - 40 – 2.80 bar (40 psi)
  - 80 – 5.50 bar (80 psi)
  - 160 – 11.0 bar (160 psi)

+ Not available with the “B” and “T” poppet
+ The operating back pressure at port 3 should never be less than 1.3 times the spring set pressure

- **Dimensions** mm (in)

  - "S" Adjustment
    - 4.0 (0.15) hex
    - 25.4 (1.00) hex
    - Torque 47-54 Nm
    - (35-40 lbf ft)

  - "F" Adjustment
    - 21.0 (0.83)
    - 0.875"-14 Thd.
    - Ø 17.45 (0.687)
    - Ø 19.02 (0.747)
Functional Symbol
DPS2-16(V)-B-S

Description
The DPS2-16 is a differential pressure sensing valve, available as either a spool or poppet type, vented or pilot operated.

Operation
This valve is used as a main section of a pilot controlled valve assembly. This valve has multiple uses when used with either directional control, flow control or pressure control cartridges. Refer to application examples in the front of this catalog.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)
Typical application pressure (spool type) .................. 290 bar (4200 psi)
(poppet type) ........................................... 240 bar (3500 psi)
Rated flow ............................................. 189 l/min (50 USgpm)
Pilot ratio (spool type P, V, R, F) .......................... 1:1
(poppet type B, S, T) .................................... 2:1
Internal leakage, poppet type .... Port 1 to 2; <5 drops/min. max. @350 bar (5000 psi)
Internal leakage, spool type ...... 82 cm³/min (5 in³/min.) max. @350 bar (5000 psi)
Temperature range ................................. -40°C to 120°C (-40°F to 248°F)
Cavity .................................................. C-16-3S (See page 34)
Standard housing materials ......................... Aluminum
Fluids ............................................... All general purpose hydraulic fluids such as:
MIL–H–5606, SAE 10, SAE 20, etc.
Filtration ............................................ Cleanliness code 18/16/13
Weight cartridge only ............................... 0.35 kg. (0.78 lbs.)
Seal kits ........................................... 889659 Buna–N
02-165871 Viton®

Viton is a registered trademark of E.I.DuPont
Model Code DPS2-16

DPS2 - 16 (V) - * - * - ** - ***

1 2 3 4 5 6 7

** Function **
DPS2 – Differential pressure sensing

** Size **
16 – 16 Size

** Seals **
Blank – Buna – N
V – Viton

** Function **
B – Poppet, vent to open, N/C
S – Poppet, vent to open, N/C
T – Poppet, Bi-directional, pilot to close, 2:1 ratio, N/C
P – Spool, N/C
V – Spool, N/C
R – Spool, pressure reducing, N/O
F – Spool, flow control, N/O

** Stroke adjustment **
F – None (Fixed stroke)
S – Screw adjustment

** Differential pressure **
5 – 0.35 bar (5 psi) +
20 – 1.40 bar (20 psi) +
40 – 2.80 bar (40 psi)
80 – 5.50 bar (80 psi)
160 – 11.0 bar (160 psi)

+ Not available with the “B” and “T” poppet
■ The operating back pressure at port 3 should never be less than 1.3 times the spring set pressure

See page 36 for housings

** Port Size **
O – Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>4B</td>
<td>3/4&quot; BSPP</td>
<td>02-175471</td>
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<tr>
<td>12T</td>
<td>SAE 12</td>
<td>566414</td>
</tr>
<tr>
<td>10H</td>
<td>SAE 10</td>
<td>876725</td>
</tr>
<tr>
<td>12H</td>
<td>SAE 12</td>
<td>876727</td>
</tr>
<tr>
<td>4G</td>
<td>1/2&quot; BSPP</td>
<td>02-160676</td>
</tr>
<tr>
<td>6G</td>
<td>3/4&quot; BSPP</td>
<td>876726</td>
</tr>
</tbody>
</table>

See page 36 for housings

** Dimensions mm (in) **

“S” Adjustment
4.8 (0.19) hex

56.0 (2.00)

38.1 (1.50) hex
Torque 108-122 Nm (80-90 lbf ft)

1.312”-12 Thd.

“F” Adjustment
27.0 (1.06)

1 2 3

Ø 25,37 (0.999)
 Ø 28,50 (1.122)

See page 36 for housings
**DPS2-20**

Differential pressure sensing valve

**Functional Symbol**

DPS2-20(V)-B-S

![Functional Symbol](image)

**Description**

The DPS2-20 is a differential pressure sensing valve, available as either a spool or poppet type, vented or pilot operated.

**Operation**

This valve is used as a main section of a pilot controlled valve assembly. This valve has multiple uses when used with either directional control, flow control or pressure control cartridges. Refer to application examples in the front of this catalog.

**Ratings and specifications**

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

- Typical application pressure (spool type) .................. 290 bar (4200 psi)
- (poppet type) ........................................... 240 bar (3500 psi)
- Rated flow .............................................. 303 l/min (80 USgpm)
- Pilot ratio (spool type  P, V, R, F) .......................... 1:1
- (poppet type  B, S, T) .................................... 2:1
- Internal leakage, poppet type  .......................... Port 1 to 2; <5 drops/min. max. @350 bar (5000 psi)
- Internal leakage, spool type  .................. 82 cm³/min (5 in³/min.) max. @350 bar (5000 psi)
- Temperature range  ...................................... -40 to 120°C (-40°F to 248°F)
- Cavity .......................................................... C-20-3S (See page 34)
- Standard housing materials  .............................. Aluminum
- Fluids ......................................................... All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.
- Filtration .................................................... Cleanliness code 18/16/13
- Weight cartridge only .................................... 0.81 kg (1.78 lbs.)
- Seal kits ................................................... 02-113153 Buna–N
- 02-112969 Viton®

Viton is a registered trademark of E.I. DuPont

**Pressure Drop Curves**

Cartridge only

![Pressure Drop Curves](image)
Model Code

DPS2-20

**DPS2 - 20 (V) - * - * - ** - *****

<table>
<thead>
<tr>
<th>Function</th>
<th>Stroke adjustment</th>
<th>Differential pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPS2 – Differential pressure sensing</td>
<td>F – None (Fixed stroke)</td>
<td>5 – 0,35 bar (5 psi) +</td>
</tr>
<tr>
<td></td>
<td>S – Screw adjustment</td>
<td>10 – 0,7 bar (10 psi) +</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 – 1,40 bar (20 psi) +</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 – 2,80 bar (40 psi)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80 – 5,50 bar (80 psi)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>160 – 11,0 bar (160 psi)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Port Size</th>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 – 20 Size</td>
<td>O – Cartridge only</td>
<td>8B</td>
<td>1” BSPP</td>
<td>02–175472</td>
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<tr>
<td></td>
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<td>12B</td>
<td>SAE 16</td>
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<td>SAE 16</td>
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<td>3/4” BSPP</td>
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<td>8G</td>
<td>1” BSPP</td>
<td>876742</td>
</tr>
</tbody>
</table>

See page 36 for housings

+ Not available with the “B” and “T” poppet
■ The operating back pressure at port 3 should never be less than 1.3 times the spring set pressure

Codes:

- “S” Adjustment
- 4.8 (0.19) hex
- 62.0 (2.44)
- 76.2 (3.00)
- □ 33,30 (1.311)
- □ 36,47 (1.436)
- □ 1,625"-12 Thd.
- □ 47,6 (1.87) hex
- Torque 129-156 Nm (95-115 lbf ft)
- □ 29,0 (1.14)
DPS2 – Spool Type Functional Symbols
DPS2 – Poppet Type Functional Symbols

DPS2–**(V)–B–S

DPS2–**(V)–B–F

DPS2–**(V)–S–S

DPS2–**(V)–S–F

DPS2–**(V)–T–S

DPS2–**(V)–T–F
Standard Cavity Dimensions

**Dimensions**

<table>
<thead>
<tr>
<th>Cavity</th>
<th>A Spotface</th>
<th>B +0.051 ( +0.002 )</th>
<th>C +0.051 ( +0.002 )</th>
<th>D</th>
<th>E Full Thread</th>
<th>F</th>
<th>G ±0.0254 ( ±0.001 )</th>
<th>H</th>
<th>J ±0.0254 ( ±0.001 )</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>C–10–3</td>
<td>30.16 (1.188)</td>
<td>24.00 (0.945)</td>
<td>20.62 (0.812)</td>
<td>0.875–14</td>
<td>15.88 (0.625)</td>
<td>2.54/2.92 (0.100/0.115)</td>
<td>21.59 (0.850)</td>
<td>17.50 (0.689)</td>
<td>38.10 (1.500)</td>
<td>15.90 (0.626)</td>
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<tr>
<td>C–10–3S</td>
<td>30.16 (1.188)</td>
<td>24.00 (0.945)</td>
<td>20.62 (0.812)</td>
<td>0.875–14</td>
<td>14.29 (0.562)</td>
<td>2.54/2.92 (0.100/0.115)</td>
<td>16.51 (0.650)</td>
<td>19.08 (0.751)</td>
<td>38.48 (1.515)</td>
<td>17.50 (0.689)</td>
</tr>
<tr>
<td>C–16–3</td>
<td>44.45 (1.750)</td>
<td>35.58 (1.401)</td>
<td>31.34 (1.234)</td>
<td>1.312–12</td>
<td>22.22 (0.875)</td>
<td>3.30/3.68 (0.130/0.145)</td>
<td>34.14 (1.344)</td>
<td>28.62 (1.127)</td>
<td>62.71 (2.469)</td>
<td>27.02 (1.064)</td>
</tr>
<tr>
<td>C–16–3S</td>
<td>44.45 (1.750)</td>
<td>35.58 (1.401)</td>
<td>31.34 (1.234)</td>
<td>1.312–12</td>
<td>17.46 (0.687)</td>
<td>3.30/3.68 (0.130/0.145)</td>
<td>20.62 (0.812)</td>
<td>28.62 (1.127)</td>
<td>46.02 (1.812)</td>
<td>25.45 (1.002)</td>
</tr>
<tr>
<td>C–20–3</td>
<td>57.66 (2.270)</td>
<td>43.59 (1.716)</td>
<td>39.12 (1.540)</td>
<td>1.625–12</td>
<td>20.64 (0.812)</td>
<td>3.35/3.73 (0.132/0.147)</td>
<td>44.45 (1.750)</td>
<td>36.55 (1.439)</td>
<td>85.72 (3.375)</td>
<td>33.38 (1.314)</td>
</tr>
<tr>
<td>C–20–3S</td>
<td>57.66 (2.270)</td>
<td>43.59 (1.716)</td>
<td>39.12 (1.540)</td>
<td>1.625–12</td>
<td>20.64 (0.812)</td>
<td>3.35/3.73 (0.132/0.147)</td>
<td>23.82 (0.938)</td>
<td>36.55 (1.439)</td>
<td>64.29 (2.531)</td>
<td>33.38 (1.314)</td>
</tr>
</tbody>
</table>

- These diameters unless otherwise specified.
- These diameters unless otherwise specified.

![Diagram of 3-way cavity](image1)

![Diagram of 3-way short cavity (S)](image2)
### Standard Cavity Dimensions

#### Dimensions

<table>
<thead>
<tr>
<th>mm (inch)</th>
<th>A Spotface</th>
<th>B ±0.051 (±0.002)</th>
<th>C ±0.051 (±0.002)</th>
<th>D</th>
<th>E Full Thread</th>
<th>F</th>
<th>G ± 0.0254 (±0.001)</th>
<th>H</th>
<th>J ± 0.0254 (±0.001)</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>C–10–4</td>
<td>30.16 (1.188)</td>
<td>24.00 (0.945)</td>
<td>20.62 (0.812)</td>
<td>0.875°–14</td>
<td>15.88 (0.625)</td>
<td>2.54/2.92 (0.100/0.115)</td>
<td>22.22 (0.875)</td>
<td>19.08 (0.751)</td>
<td>38.10 (1.500)</td>
<td>17.50 (0.689)</td>
</tr>
<tr>
<td>C–16–4</td>
<td>44.45 (1.750)</td>
<td>35.58 (1.401)</td>
<td>31.34 (1.234)</td>
<td>1.312°–12</td>
<td>22.22 (0.875)</td>
<td>3.30/3.68 (0.130/0.145)</td>
<td>34.14 (1.344)</td>
<td>28.62 (1.127)</td>
<td>62.71 (2.469)</td>
<td>27.02 (1.064)</td>
</tr>
<tr>
<td>C–20–4</td>
<td>57.66 (2.270)</td>
<td>43.59 (1.716)</td>
<td>39.12 (1.540)</td>
<td>1.625°–12</td>
<td>20.64 (0.812)</td>
<td>3.35/3.73 (0.132/0.147)</td>
<td>44.45 (1.750)</td>
<td>36.55 (1.439)</td>
<td>85.72 (3.375)</td>
<td>33.38 (1.314)</td>
</tr>
</tbody>
</table>

#### Cavity mm (in.)

<table>
<thead>
<tr>
<th>L</th>
<th>± 0.0254 (±0.001)</th>
<th>N</th>
<th>P</th>
<th>R Max. Dia.</th>
<th>S</th>
<th>T Max. Dia.</th>
<th>U</th>
<th>V</th>
<th>X Max. Dia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C–10–4</td>
<td>53.98 (2.125)</td>
<td>15.90 (0.626)</td>
<td>63.50 (2.500)</td>
<td>18.26 (0.718)</td>
<td>6.35 (0.250)</td>
<td>34.13 (1.343)</td>
<td>6.35 (0.250)</td>
<td>50.00 (1.968)</td>
<td>6.35 (0.250)</td>
</tr>
<tr>
<td>C–16–4</td>
<td>91.29 (3.594)</td>
<td>25.45 (1.002)</td>
<td>103.99 (4.094)</td>
<td>24.60 (0.968)</td>
<td>15.88 (0.625)</td>
<td>53.18 (2.093)</td>
<td>15.88 (0.625)</td>
<td>81.76 (3.218)</td>
<td>15.88 (0.625)</td>
</tr>
<tr>
<td>C–20–4</td>
<td>127.00 (5.000)</td>
<td>31.78 (1.251)</td>
<td>141.27 (5.562)</td>
<td>30.96 (1.218)</td>
<td>25.40 (1.000)</td>
<td>71.44 (2.812)</td>
<td>25.40 (1.000)</td>
<td>112.71 (4.437)</td>
<td>25.40 (1.000)</td>
</tr>
</tbody>
</table>

Note: These diameters ± 0.051 mm (±0.002 inch) B unless otherwise specified.

Note: These diameters ± 0.025 mm (±0.001 inch) A unless otherwise specified.
## C-**-3S Aluminum Housings

<table>
<thead>
<tr>
<th>Housing</th>
<th>Ports 1, 2 &amp; 3</th>
<th>Part Number</th>
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<tbody>
<tr>
<td>C-10-3S Light Duty</td>
<td>SAE 6</td>
<td>566413</td>
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<td></td>
<td>3/8&quot; BSPP</td>
<td>02-175470</td>
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<tr>
<td>C-16-3S Light Duty</td>
<td>SAE 12</td>
<td>566414</td>
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<td>3/4&quot; BSPP</td>
<td>02-175471</td>
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<tr>
<td>C-20-3S Light Duty</td>
<td>SAE 16</td>
<td>566415</td>
</tr>
<tr>
<td></td>
<td>1&quot; BSPP</td>
<td>02-175472</td>
</tr>
<tr>
<td>C-10-3S Fatigue Rated</td>
<td>1/4&quot; BSPP</td>
<td>876707</td>
</tr>
<tr>
<td></td>
<td>SAE 6</td>
<td>876706</td>
</tr>
<tr>
<td></td>
<td>3/8&quot; BSPP</td>
<td>876710</td>
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<tr>
<td>C-16-3S Fatigue Rated</td>
<td>1/2&quot; BSPP</td>
<td>02-160676</td>
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<tr>
<td></td>
<td>SAE 10</td>
<td>876725</td>
</tr>
<tr>
<td></td>
<td>3/4&quot; BSPP</td>
<td>876726</td>
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<td>SAE 12</td>
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<tr>
<td>C-20-3S Fatigue Rated</td>
<td>3/4&quot; BSPP</td>
<td>876740</td>
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<tr>
<td></td>
<td>1&quot; BSPP</td>
<td>876742</td>
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<td></td>
<td>SAE 16</td>
<td>876743</td>
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</table>

Note: BSPP porting is designated by either "B" or "G" in the model code.

SAE porting is designated by either "H" or "T" in the model code.

<table>
<thead>
<tr>
<th>Cavity mm (inch)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>Mass kg (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-10-3S Light Duty</td>
<td>63.5</td>
<td>34.9</td>
<td>69.8</td>
<td>38.1</td>
<td>19.1</td>
<td>3.1</td>
<td>12.7</td>
<td>31.7</td>
<td>7.1</td>
<td>12.7</td>
<td>0.2 (0.51)</td>
</tr>
<tr>
<td>C-16-3S Light Duty</td>
<td>88.9</td>
<td>47.6</td>
<td>88.9</td>
<td>60.3</td>
<td>30.1</td>
<td>4.0</td>
<td>17.4</td>
<td>38.1</td>
<td>8.7</td>
<td>19.0</td>
<td>0.7 (1.66)</td>
</tr>
<tr>
<td>C-20-3S Light Duty</td>
<td>101.6</td>
<td>57.1</td>
<td>107.9</td>
<td>69.8</td>
<td>34.9</td>
<td>4.0</td>
<td>20.6</td>
<td>50.8</td>
<td>8.7</td>
<td>19.0</td>
<td>1.2 (2.62)</td>
</tr>
<tr>
<td>C-10-3S Fatigue Rated</td>
<td>76.2</td>
<td>38.1</td>
<td>76.2</td>
<td>50.8</td>
<td>25.4</td>
<td>9.5</td>
<td>16.8</td>
<td>33.5</td>
<td>7.1</td>
<td>19.0</td>
<td>0.7 (1.65)</td>
</tr>
<tr>
<td>C-16-3S Fatigue Rated</td>
<td>114.3</td>
<td>60.3</td>
<td>114.3</td>
<td>63.5</td>
<td>31.7</td>
<td>10.3</td>
<td>20.4</td>
<td>41.1</td>
<td>8.7</td>
<td>25.4</td>
<td>2.0 (4.40)</td>
</tr>
<tr>
<td>C-20-3S Fatigue Rated</td>
<td>127.0</td>
<td>63.5</td>
<td>127.0</td>
<td>82.5</td>
<td>41.2</td>
<td>10.3</td>
<td>24.9</td>
<td>55.0</td>
<td>8.7</td>
<td>25.4</td>
<td>3.6 (8.00)</td>
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</tbody>
</table>
Supporting Products

Roughing Tools
Roughers are basically step drills which leave .030” per cutting diameter and .015” above all radii for the finishing reamer, with an additional .015” depth in the cavity bottom as clearance. The roughing tool is necessary to prepare the cavity for the finishing reamer, which has not been designed for the primary forming or bottom cutting. We offer two types of roughers, one for aluminum and one for steel. The aluminum rougher is manufactured with a 4 facet point and polished flutes. The steel rougher is supplied with a standard drill point. Both types will work in either material, however, longevity of an aluminum tool will be sacrificed when used continually in steel.

<table>
<thead>
<tr>
<th>Cavity</th>
<th>Material</th>
<th>Model Code</th>
<th>Assembly Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Way</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C–10–3</td>
<td>Aluminum</td>
<td>RT–10–3–A–8038</td>
<td>889511</td>
</tr>
<tr>
<td>C–10–3</td>
<td>Steel</td>
<td>RT–10–3–S–8043</td>
<td>889512</td>
</tr>
<tr>
<td>C–16–3</td>
<td>Aluminum</td>
<td>RT–16–3–A–8039</td>
<td>565825</td>
</tr>
<tr>
<td>C–16–3</td>
<td>Steel</td>
<td>RT–16–3–S–8044</td>
<td>889517</td>
</tr>
<tr>
<td>C–20–3</td>
<td>Steel</td>
<td>RT–20–3–S–8046</td>
<td>566706</td>
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<tr>
<td>3-Way Short</td>
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<td>C–10–3S</td>
<td>Aluminum</td>
<td>RT–10–3S–A–8099</td>
<td>565824</td>
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<tr>
<td>C–10–3S</td>
<td>Steel</td>
<td>RT–10–3S–S–8209</td>
<td>566703</td>
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<tr>
<td>C–16–3S</td>
<td>Aluminum</td>
<td>RT–16–3S–A–8040</td>
<td>02–165582</td>
</tr>
<tr>
<td>C–16–3S</td>
<td>Steel</td>
<td>RT–16–3S–S–8045</td>
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<td>C–20–3S</td>
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</tr>
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<td>RT–20–3S–S–8047</td>
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<tr>
<td>4-Way</td>
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<td>C–10–4</td>
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<td>RT–10–4–A–8072</td>
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<td>Steel</td>
<td>RT–10–4–S–8073</td>
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<td>Aluminum</td>
<td>RT–16–4–A–8074</td>
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<td>Steel</td>
<td>RT–16–4–S–8075</td>
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<td>C–20–4</td>
<td>Aluminum</td>
<td>RT–20–4–A–8076</td>
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<tr>
<td>C–20–4</td>
<td>Steel</td>
<td>RT–20–4–S–8077</td>
<td>566707</td>
</tr>
</tbody>
</table>

Finishing Tools
These finishing tools have been designed as precision reamers for finishing operations only. They are not intended for primary forming or bottom cutting operations. Vickers recommends that a finishing tool only be used in a properly roughed hole. Failure to conform to this practice will produce unsatisfactory size and finishes and possibly break the tool.

<table>
<thead>
<tr>
<th>Cavity</th>
<th>Material</th>
<th>Model Code</th>
<th>Assembly Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Way</td>
<td></td>
<td></td>
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<tr>
<td>3-Way Short</td>
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<tr>
<td>C–16–3S</td>
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<td>4-Way</td>
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<td>FT–20–4–AS–8085</td>
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# Supporting Products

## Finishing Form Tools Speed & Feed for Aluminum 6061–T6 (T651)

This information is recommended as a good starting point. Speeds and/or feeds may be increased or decreased depending on actual machining conditions.

NOTE: Finish form tools may require 1/2 to 1-1/2 second dwell to obtain necessary finish.

### CNC MACHINE TOOL

<table>
<thead>
<tr>
<th>Tool Size</th>
<th>RPM</th>
<th>IPM</th>
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<tr>
<td>C–10–4</td>
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<tr>
<td>C–16–3</td>
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<td>C–16–3S</td>
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</tr>
<tr>
<td>C–16–4</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>C–20–3</td>
<td>500</td>
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<td>C–20–3S</td>
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### BRIDGEPORT / LAGUN TYPE MACHINES

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<td>C–16–3S</td>
<td></td>
<td></td>
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<td>C–16–4</td>
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<td>C–20–4</td>
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</tbody>
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## Application Data

### Fluid Cleanliness

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity, and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Vickers publication 561 “Vickers Guide to Systemic Contamination Control” available from your local Vickers distributor or by contacting Vickers, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

Recommended cleanliness levels, using petroleum oil under common conditions, are based on the highest fluid pressure levels in the system and are coded in the chart below. Fluids other than petroleum, severe service cycles, or temperature extremes are cause for adjustment of these cleanliness codes. See Vickers publication 561 for exact details.