The New Humphrey 315/415 Series Valves

The only compact, direct-acting valve with a .42 Cv flow rate

There are plenty of compact, direct-acting solenoid valves. But only one offers a high flow rate -- the new Humphrey 315/415 Series pneumatic valves.

Our patent-pending design uses a lip seal on the poppet valve, allowing the air inside the valve to help make a tight seal. This enabled us to increase the flow rate to .42 Cv -- up to three-times higher than any other comparable valve -- yet keep the body just 19mm wide.

Humphrey 315/415 Series valves are available with 1/8” NPT ports in multi-purpose 3-way configurations and five port 4-way configurations with optional flow controls. The common body design enables both types to be mounted together inline or on a manifold. For more information, see your local Humphrey distributor, or contact us directly.
Don’t Take Chances
Compressed air is an extremely powerful medium. Always take maximum precautions when handling any component of a compressed air system. Never attempt to construct, replace, operate or service any component of a compressed air system unless you have been specifically and properly trained to do so. Always disconnect the supply air and exhaust the air system before attempting to remove or service a component of that system. Failure to heed these warnings could result in SERIOUS, EVEN FATAL, PERSONAL INJURY.

Design And Specifications
The design and specifications and other product information contained in this catalog is for general reference purposes based upon customary and usual manufacturing standards and product applications. However, it is difficult to predict or to anticipate the functioning or suitability of the product for any particular application or use. Therefore, nothing herein shall be deemed a representation or warranty of the product design or specifications and Buyer shall have the responsibility for investigating and testing the product in any particular application or use and all risks attendant in such use.

Humphrey Products Company
1-800-477-8707
Kalamazoo MI 49003
http://www.humphrey-products.com
**315/415 Series Direct-Acting Solenoid Valves**

- Low profile, high density two-gallery manifolds
- Accepts 315 Series 3-way valves
- Valves can be mounted for Normally Closed or Normally Open operation
- Options include block off plates, isolator plugs, separate air supply plates and brackets for DIN rail mounting

- Direct-acting solenoid
- New patent pending self-energizing seal
- 0.42 \( C_v \) flow rate (ANSI/NFPA T3.21.3 - 1990)
- Rated from 28"Hg to 125 psig
- NEMA 4 rated (IP-65)
- Compact size (19mm width)
- Low power consumption (5 watts)
- 1/8" NPSF ports
- Same body used for inline and manifold mounting

- Low profile, high density three-gallery manifolds
- Common pressure / Individual exhaust ports
- Accepts 415 Series 5-port, 4-way valves
- Also accepts 315 Series 3-way valves
- Valves can be mounted for N.C./N.O. operation
- Options include block off plates, isolator plugs, separate air supply plates and brackets for DIN rail mounting
315/415 Series Valves

**315 SERIES**

- Pneumatic diagram showing the normal condition and actuated condition.

**415 SERIES**

- Pneumatic diagram showing the normal condition and actuated condition.

**ANSI PIPING DIAGRAMS**

<table>
<thead>
<tr>
<th>SERIES</th>
<th>3-WAY NORMALLY CLOSED</th>
<th>3-WAY NORMALLY OPEN</th>
<th>SELECTOR</th>
<th>DIVERTER</th>
<th>2-WAY N.C.</th>
<th>2-WAY N.O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>315</td>
<td><img src="315Diagram.png" alt="Diagram" /></td>
<td><img src="315Diagram.png" alt="Diagram" /></td>
<td><img src="315Selector.png" alt="Selector" /></td>
<td><img src="315Diverter.png" alt="Diverter" /></td>
<td><img src="315NC.png" alt="2-Way NC" /></td>
<td><img src="315NO.png" alt="2-Way NO" /></td>
</tr>
<tr>
<td>415</td>
<td><img src="415Diagram.png" alt="Diagram" /></td>
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<td><img src="415Selector.png" alt="Selector" /></td>
<td><img src="415Diverter.png" alt="Diverter" /></td>
<td><img src="415NC.png" alt="2-Way NC" /></td>
<td><img src="415NO.png" alt="2-Way NO" /></td>
</tr>
</tbody>
</table>
15/415 SPECIFICATIONS

Features: Line Mounted Line Mount (2 & 3 - Gallery Bar Stock Manifold)

Power Consumption (AC/DC): 5 Watts
Stroke (Inches): 315 / 415: 0.022 (nominal)
Surge Suppression TSD - Option Code 50
Weight: 315: .315 lbs. (0.42 kg)
415: .390 lbs. (0.22 kg)
Agency Approvals Consult Factory
Type of Operation Direct Acting Solenoid
Coil General Purpose Class B, continuous duty rated, encapsulated
Mounting Position Any
Media Air or Net Gases
Pressure Range 20 Hg Vacuum to 125 psi g
Filteration 40 Micron recommended
Response Time 315: 0.050 / 0.008 (CC)
415: 0.060 / 0.021 (AC)
Effective Area (Sq. in.) 0.0123
Maximum Cycle Rate (CMR) 2342 (DC), 1483 (AC)
Materials Buna-N, Brass, Anodized Aluminum, optional fluoroplastic
Ambient Temp Range 32°F to 125°F
Leak Rate (max) 4 cc/minute @ 100 psi g
Package Rating NEMA 4 (IP-66)
Dimensions (inches) 315 Series: .75 x 1.44 x 3.03
415 Series: .75 x 1.44 x 3.66
Coil Testing All coils are "HiPot" tested between coil windings and coil frame
DIN Connector Micro Mini 9mm
DIN Rail Mounting (15mm) 315: Yes
415: Yes

FLOW RATES / Cv

Humphrey recommends "fill/exhaust" times which are related to arious chamber sizes, as the best method for calculating total volume device (i.e., cylinder) response time. Humphrey recognizes the industry's use of flow coefficient Cv as a comparison standard.

Consequently, Humphrey offers three types of flow data. The National Fluid Power Association's (NFPA) standards for Cv, the SCFM flow rate determined by flowing to atmosphere, and Humphrey's preferred "fill/exhaust" times:

<table>
<thead>
<tr>
<th>Model</th>
<th>SCFM @100 PSI</th>
<th>Fill Time (Sec) (0 to 95% Response)</th>
<th>Exhaust Time (Sec) (100 to 50% Response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td></td>
<td>1 10 100</td>
<td>1 10 100</td>
</tr>
</tbody>
</table>

RESPONSE TIMES

Identification of response time areas

T1 times are measured from point (1) (oil entered) to point (2) (10% of supply pressure).

T2 times are measured from point (2) (detection of outlet pressure) to point (3) (90% of supply pressure).

AC/DC Voltages

Voltage T1 T2 T3 T4
AC .018 .020 .016 .003
DC .018 .020 .005 .003

Time in seconds (nominal)

ELECTRICAL SPECIFICATIONS

• All coils come standard with 24-inch black lead wires.
• Optional 72-inch lead wires are available Option Code (LL).
• Optional DIN connectors (Option Code 39) are available.
• All AC coils are rated at 50/60 Hertz.
• All coils utilize Class B insulation materials.
• Resistance and current are nominal values.
• Valves are "HiPot" tested.
• Ensure proper voltage supply per voltage label rating, +10% / -15% for AC or DC voltages.
MANIFOLDS

315 Manifolds

MOUNTING: .16 DIA. THRU 1 WHEN NOT USING DIN CLIP
2 PLACES

315 MANIFOLD ENDPLATE

315 SEPARATE AIR SUPPLY PLATE

315 MANIFOLD STATION BLOCK-OFF PLATE

415 Manifolds

MOUNTING: .16 DIA. THRU 1 WHEN NOT USING DIN CLIP
4 PLACES

415 MANIFOLD ENDPLATE

415 SEPARATE AIR SUPPLY PLATE

415 MANIFOLD STA BLOCK-OFF PLATE

ACCESSORIES

Speed Control: 415-SC
Includes:
(2) screws and
(3) o-ring seals

Manifold Station Block-off Plates: 315-BOP

Manifold Plug: 415-BOP

Manifold End Plate: 315M-EP
(includes:
(2) end plates.
(8) screws and
(4) o-ring seals)

Manifold End Plate: 415M-EP
(includes:
(2) end plates.
(8) screws and
(4) o-ring seals)

Separate Air Supply Plate: 315-SSP
(includes:
(2) screws and
(3) o-ring seals)

Separate Air Supply Plate: 415-SSP
(includes:
(2) screws and
(3) o-ring seals)

Isolator Plug: DP
(For applications requiring two different pressures, on compressors and vacuum. Refer to Multi-Pressure Manifolds section for further information and considerations.)

DIN Rail Clip: DRC
(includes (2) clips and (2) screws)

Valve Mounting Kits: 315-MK
(includes (2) screws and (2) o-ring seats.
415-MK (includes (2) screws and (3) o-ring seats)
**How to Order Valves**

**NOTE:** Standard valves are furnished with 24-inch flying leads and a push, non-locking manual override. Option codes marked STD and NA are not used as part of the model number when ordering. OS indicates that the Option must be ordered separately and is not used as part of the Model Number.

NA = Not available
OS = Order separately, additional charge for this option
STD = Standard
SP = Specify, additional charge for this option

A 1/8 inch pipe plug is included with each valve unit when ordering Option Code #2.

**DIN Connector (Socket) Options**

- Model HS-2: DIN connector (only) for use with Option Code 39
- Model HS2 LED: DIN connector with LED for use with Option Code 39 (12V, 24V, 120 VAC; specify voltage.)
- Model HS2-CLL: Molded (6) ft. cable and assembly for use with Option Code 39 (DIN Connector).

Note: DIN Connector Options must be ordered separately.

**How to Order Manifolds**

**315 Manifold**

<table>
<thead>
<tr>
<th>Manifold type</th>
<th>2-galley, fixed length bar stock (2-12 stations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap</td>
<td>1/4&quot; NPSF</td>
</tr>
<tr>
<td>Port Identification</td>
<td>Pressure = 1, Exhaust = 3</td>
</tr>
</tbody>
</table>

Example: 315 Series 2 Station Manifold; Order: 315M-2

**415 Manifold**

<table>
<thead>
<tr>
<th>Manifold type</th>
<th>3-galley, fixed length bar stock (2-12 stations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap</td>
<td>1/4&quot; NPSF</td>
</tr>
<tr>
<td>Port Identification</td>
<td>Pressure = 1, Exhaust = 3 &amp; 5</td>
</tr>
</tbody>
</table>

Example: 415 Series 6 Station Manifold; Order: 415M-6

**415 Series Valves**

(with optional environmental cover)

**ASSEMBLY AND ACCESSORY USE**

**Separate Air Supply Plate**

**Manifold Station Block-off Plates**

**315 Series Valve**

(with optional environmental cover)

**Manifold Plug**

(Used to block off an exhaust port when using a 315 Series 3-way valve on a 415 manifold.)

**415 Series Valves (with optional environmental cover)**

**Manifold End Plate**

**Isolator Plug**

(Insert plug into gallery, and when oriented, tighten screw to compress plug, forcing o-ring against gallery wall. Torque screw to 10-13 in/lbs. Be careful not to over-torque the screw.)

**Sandwich Style Speed Control**

Speed control sandwich mounts between the 415 Series valve unit and manifold assembly. The Speed Control is intended to be used for the metering of the compressed air flow from cylinder to exhaust (i.e., Port 2 - 3 and Port 4 - 5). For optimal access to the adjustment screws, we recommend that the adjustment screws be positioned on the same end as the valve unit's manual override.

Note: Since the Speed Control unit is symmetrical, it can be positioned on the same end as the solenoid.

**Standard Valve Order Example:** Model 315-21-39-EC-120 50/60

**Coil is field-adjustable 180°, or may be ordered from factory, rotated.**

**Model / 315 Series**

- 315M-2
- 315M-3
- 315M-4
- 315M-5
- 315M-6
- 315M-7

**Model / 315 Series**

- 415M-2
- 415M-3
- 415M-4
- 415M-5
- 415M-6
- 415M-7

**Model / 415 Series**

- 415M-8
- 415M-9
- 415M-10
- 415M-11
- 415M-12
- 415M-13
**Valve/Manifold Assembly Request**

### 315 Manifold

<table>
<thead>
<tr>
<th>Station</th>
<th>Valve Part No.</th>
<th>Voltage</th>
<th>Valve Orientation</th>
<th>Accessories Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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Please circle the number of stations desired on the drawing above. For each station having a valve, please indicate the complete Part No., including option codes and voltage, and whether you want the valve to be Normally Open or Normally Closed.

For stations without valves, please specify under Accessory Part No., whether you want a Manifold Station Block-off Plate or a Separate Air Supply Plate. If you wish to isolate the manifold into two separate sections, please specify below where the Isolator Plugs should be.

### 415 Manifold

<table>
<thead>
<tr>
<th>Station</th>
<th>Valve Part No.</th>
<th>Voltage</th>
<th>Valve Orientation</th>
<th>Accessories Part No.</th>
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</table>

Please circle the number of stations desired on the drawing above. For each station having a valve, please indicate the complete Part No., including option codes and voltage, and any accessories, such as a Sandwich Speed Control or Block-off Plate.

When using a 315 Series valve on a 415 Series manifold, please indicate whether you want the valve to be Normally Open or Normally Closed. Note: you also must order a Manifold Plug.

For stations without valves, please specify under Accessory Part No., whether you want a Manifold Station Block-off Plate or a Separate Air Supply Plate. If you wish to isolate the manifold into two separate sections, please specify below where the Isolator Plugs should be.

**Order Example**

This is an example of an order for a seven-station manifold assembly, based on the exploded drawing on the previous page.
rrouble shooting
valve fails to function when electrical power is supplied:
Check valve function using manual override. If valve
actions by manual actuation, proceed to steps 2 and 3.
valve does not function, proceed to step 4. For valves
without manual override, proceed to steps 2 and 3.
Check line voltage and compliance with valve electrical
rating.
Check valve for inoperable (open) coil, measuring milliamps
or Electrical Specifications Chart.
Check that the air supply has been delivered in adequate
volume and pressure for proper functioning of the device.
Assure that there are no blockages due to air line
contamination or defective/blockaded fittings.

Mounting Valves and Accessories to Manifolds
15 & 415 Series Valves: When mounting valves to manifold,
sure that a o-ring seal is properly located in each cavity of
the manifold prior to mounting a valve unit. By rotating the
15 Series valve (180°), it can be converted from a 3-way
normally-Closed to 3-way Normally-Open function. Using
screws furnished, tighten to 10-13 inch-pounds of torque.
Careful not to over-torque the screws.

Accessories
When installing the 415 Series Speed Control (# 415 SC)
ke extra care to ensure that the o-rings are installed between
e valve and speed control and speed control and manifold.

When connecting the Separate Air Supply (# 315-SSP or
15-SSP) and/or Block-off Plate (# 315-BOP, 415-BOP), to
the manifold, install a o-ring in each cavity of the manifold prior
mounting the accessory item. Using screws furnished, tighten
10-13 inch-pounds of torque. Be careful not to over-torque
e screws. Appropriate o-rings and mounting screws are
mished with each accessory item.

Multi-pressure Manifolds
Create a dual pressure (DP) manifold. Install the Isolator
plug (DP) in-between the appropriate valve stations. See
illustration on page 80.

The accessory Isolator Plug (DP) has been pressure-tested
well beyond the rated limits of the valves, manifold and other
cessory components. As such, it should remain fully
ctional in normal dual pressure or pressure/vacuum
lications when all components are used within their rated
its. Humphrey Products cannot warrant the satisfactory
formance of the Isolator Plug (DP) when any components
 subjected to extreme environmental conditions such as
cessive vibration, wide temperature variations, or other
ditions beyond the control of Humphrey Products that
ight result in migration, leakage or failure of the Isolator
plug. Please determine the suitability of this product for your
tended application prior to ordering and use.

Installation
Valves can be mounted in any position in most environments,
in keeping with the specifications. 315/415 valves feature a
Class B insulation system and molded coil for ambient
temperatures from 32° F to 125°F (0° to 50° C).
Valves can be mounted by using the mounting holes
provided. A DIN rail mounting clip is also available for
manifolds. To order the DIN Rail Clip specify the DRC option
Code. Kit includes two clips and screws.

Lubrication
Humphrey 315/415 Series valves can be operated with or without
air line lubrication, depending on the application. If air cylinders
or other devices require lubrication, ensure that the lubricating
oils are chemically compatible with BUNA-N elastomers and are
of sufficient viscosity to assure adequate lubrication. The
equivalent to turbine oil Class 1 (ISO VG32) is recommended.
Avoid using thin or low viscosity oils (spindle oil, machine oil,
etc.) since they do not provide a good residual film of lubrication.

Media / Pressure / Filtration
Humphrey 315/415 Series valves are designed for use with
compressed air or inert gases from vacuum service (28”Hg) to
125 psig. Media should be inert gas and/or clean, dry air.
When in doubt, install a filter with filtering capacity of 40
microns or less. Periodically, remove and clean or replace filter
element. Consult factory if using other media.

Rotating the Solenoid (180 degrees)
Humphrey 315/415 Series valves are designed to allow the
end-user to rotate the coil 180 degrees, by the removal of two
screws and then simply rotating the coil into position. Prior to
rotating the coil, be sure that the supply pressure has been
disconnected and properly vented from the valve prior to
attempting this conversion. Be careful not to mis-align the
gasket or internal spring when tightening the solenoid. Mis-
alignment can prevent proper operation and/or shorten the life
of the valve. Caution should be taken when doing this in the field.

Warranty
All valves have a one-year warranty from date of manufacture.
This warranty includes repair and/or replacement at no charge
should the product be deemed defective due to workmanship
and/or material. (See detailed Product Warranty in Humphrey’s
General Valve Catalog.)

Caution! ⚠️
Compressed air is powerful and may be dangerous. Before
attempting to remove or service a component from an air line
or system, always disconnect the supply air and thoroughly
exhaust the line or system. Never attempt to construct, operate,
or service anything using compressed air unless you have been
properly trained to do so. Failure to heed this warning could
result in PROPERTY DAMAGE AND/OR SERIOUS, EVEN
FATAL, PERSONAL INJURY. See additional warning on
page 252.
THE HUMPHREY 300/400 FAMILY OF VALVES

More Options for Size, Flow and Flexibility

Humphrey now offers you more options for your applications. Our family of direct-acting pneumatic valves gives you a broad range of choices -- from the compact 310/410 Series with a .12 $C_v$, to the new compact, high performance 315/415 Series with a .42 $C_v$, up to the powerful 320/420 Series with a 1.0 $C_v$.

All valves are two-position, direct-acting single solenoid valves with a spring return. They can be used as Normally Open, Normally Closed or as a diverter. And all are designed and engineered for performance and reliability.

310/410 SERIES

310 Series
- Multi-purpose 3-way
- Three 1/8" ports
- 0.12 $C_v$
- 4.5 watts power consumption
- Can be used on same manifold with 410 Series valves

410 Series
- Multi-purpose 4-way
- Four 1/8" ports
- 0.14 $C_v$
- 4.5 watts power consumption
- Optional integral dual flow controls

315 Series
- Multi-purpose 3-way
- Three 1/8" ports
- 0.42 $C_v$
- 5.0 watts power consumption
- Can be used on same manifold with 415 Series valves

415 Series
- Multi-purpose 4-way
- Five 1/8" ports
- 0.42 $C_v$
- 5.0 watts power consumption
- Optional sandwich-style speed control

320 Series
- Multi-purpose 3-way
- Three 1/4" ports
- 1.0 $C_v$
- 8.0 watts power consumption

420 Series
- Multi-purpose 4-way
- Four 1/4" ports
- 1.0 $C_v$
- 8.0 watts power consumption

Humphrey

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