## Solenoid Valves

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<td>2 Position, 2 Way, N.O. Spool</td>
<td>19/5</td>
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<td>*These valves fit the C09-2 Parker cavity.</td>
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<td>2 Position, 4 Way</td>
<td>19/5</td>
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<tr>
<td><strong>2 WAY POPPET TYPE</strong></td>
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<tr>
<td>DSL081</td>
<td>C08-2</td>
<td>2 Position, 2 Way, N.C. or N.O.</td>
<td>30/8</td>
<td>250/3600</td>
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<td>DSH081</td>
<td>C08-2</td>
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<td>30/8</td>
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<td>DSH101</td>
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<td>DSL201*</td>
<td>C20-2</td>
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<td>SV29-SV30</td>
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<td>GH02 01</td>
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</tr>
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<td>GS02 80*/81</td>
<td>C08-2</td>
<td>Bi-Directional Poppet, N.C.</td>
<td>58/15</td>
<td>350/5000</td>
<td>SV35-SV36</td>
</tr>
<tr>
<td>GS04 80*/81</td>
<td>2R</td>
<td>Bi-Directional Poppet, N.C.</td>
<td>76/20</td>
<td>350/5000</td>
<td>SV37-SV38</td>
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<tr>
<td>GS06 80*/81</td>
<td>C16-2</td>
<td>Bi-Directional Poppet, N.C.</td>
<td>285/75</td>
<td>350/5000</td>
<td>SV39-SV40</td>
</tr>
<tr>
<td>GS02 77/78</td>
<td>C08-2</td>
<td>Bi-Directional Poppet, N.O.</td>
<td>1.7/4.5</td>
<td>210/3000</td>
<td>SV41-SV42</td>
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<tr>
<td>GS02 85*/86</td>
<td>C08-2</td>
<td>Bi-Directional Poppet, N.O.</td>
<td>58/15</td>
<td>350/5000</td>
<td>SV43-SV44</td>
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<tr>
<td>GS04 85*/86</td>
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<td>76/20</td>
<td>350/5000</td>
<td>SV45-SV46</td>
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<td>GS06 85*/86</td>
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<td>350/5000</td>
<td>SV47-SV48</td>
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<tr>
<td>*210/3000 psi rating</td>
<td></td>
<td></td>
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</tbody>
</table>

*Denotes New Winner’s Circle Product Line.*
INTRODUCTION
This technical tips section is designed to help familiarize you with the Parker line of Solenoid Valves. In this section we highlight new products to this catalog as well as some design features of our solenoid valves. In addition we present common options available to help you in selecting products for your application. Finally, we give a brief synopsis of the operation and applications of the various products offered in this section. Some tips in applying and selecting our products are provided throughout this guide.

NEW PRODUCTS
There are several new additions and product improvements to our Solenoid Valve product line.

Here are just some of the design features and advantages to the product line.

* Exceeds IP69k Specifications
  After exhaustive testing, the new Super Coil has clearly distanced itself from the competition. This coil was subjected to the rigors of this environmental standard and the results were excellent. This coil stands up to most rugged of environmental conditions including weather, dust, and extreme temperature variations.

* Water Dunk Test Qualified
  The Super Coil was taken to task in a repeated water dunk thermal cycle test program with alternate exposure to high and low temperature, only to perform with outstanding results.

* Endurance Tested
  The goal of this test was to cycle the coil to high temperature extremes in order to validate the coils ability to perform in extreme temperature environments.

* Water Spray and Chemical Solvent Compatibility
  The Super Coil was subjected to numerous chemical solvents in a rigorous test which established the fact that these coils can withstand harsh and unusual environments. Also, the coils were subjected to a high pressure water spray test. Once again, the Super Coil passed this test.

New Parker SUPER COIL Now Available!

* Exceeds IP69k Specifications
  *Nylon Insert Nut
  Nylon inserted jam nut resists vibration preventing the nut from backing out. *Used only on DSH/DSL series.

* Water Dunk Test Qualified
  Standard 4301 Polyurethane Seal eliminates the need for backup rings providing easier manifold installation. (For more information on “D”-Ring see Technical Data Section)

* Endurance Tested
  *Deutsch molded connector or LS option is highly recommended.
  NOTE: LS coil option will be available January 1, 2011.

New Parker SUPER COIL Now Available!
**Solenoid Valves**

**COMMON OPTIONS**
As you will see, Parker offers a variety of solenoid valve products. As such, some of the options mentioned below may not be available on all valves. Consult the model coding and dimensions for each valve for more specifics. Here are some of the common options available.

**Seals:** The Winner’s Circle products feature a standard Polyurethane “D”-Ring. The “D”-Ring eliminates the need for backup rings. For more information on the “D”-Ring see the Technical Data section of the catalog. The majority of the products are available in Nitrile or Fluorocarbon Seals. You should always match the seal compatibility to the temperature and fluid being used in your application.

**Coils:** Coils can be ordered as part of the full assembly or separately. Various terminations and voltages are available. For detailed information on the coil options consult the coil section of the catalog. The ordering information for each valve will direct you to the proper coil.

**Manual Overrides:** Many of our solenoid valves are also offered with a manual override. The override allows the user to shift the valve when coil force is not available. They provide a means of shifting the solenoid valve due to a loss of power or a coil failure. Overrides are intended for infrequent usage and are not designed to be used as a primary method of valve actuation.

The most common override option for the 2 Position valves is the push & twist style shown below. With a normally closed valve or a pull style tube, the valve is in normal operation (or de-energized) when the pin is seated in the slotted groove at the lowest position. To shift the valve manually, the operator pushes down on the knob and twists is clockwise. Once the pin is seated in the slotted groove, the operator can remove pressure and the valve will stay actuated.

In addition to the push and twist style override, normally closed (pull style tube) 2 position valves can be ordered with a pull and release override. Normally open (push style) 2 position valves are available with flush style and extended style overrides. These overrides are not detented. Each style is shown below.

![Pull and Release Manual Override](image1)

![Flush Manual Override](image2)

![Extended Manual Override](image3)

3 Position valves are offered with a Push / Pull style override. This override is not detented. Springs hold the spool of the valve in the center position of the valve. When the knob is pulled, the spool is moved upward simulating the action of the upper coil. When the override is pushed, the spool moves downward simulating the action of the lower coil. When no pressure is applied to the knob, it centers the spool.

![Push Position](image4)

![Normal Position](image5)

![Pull Position](image6)

**Screens:** 2 way valves can be ordered with a small mesh screen (60 x 60 mesh) placed over the cage of the cartridge valve. This screen is intended for cursory protection of the internal components of the solenoid valve. It should not be used as the primary method of filtration. The mesh catches small pieces of debris that could impede spool or poppet movement. Note that a screen will trap debris from both directions. Thus, any debris coming from the nose of the cartridge would be trapped inside the valve. As such, we recommend that screens be implemented in only applications where hydraulic fluid passes through the cartridge from the side of the cage to the nose. It should also be noted that the pressure drop through the cartridge will be increased slightly due to the small restriction of the mesh. As the screen fills with debris, pressure drop will continue to rise.
PRODUCT TYPES / APPLICATIONS

Two Way Poppet Valves
Two way poppet valves are pilot operated, low leakage solenoid actuated valves. Two way poppet valves control the flow of a two way function by blocking flow in one direction (similar to a check valve). They are generally selected due to their low leakage and ability to meet higher flow requirements. Poppet valves are often used on single operation actuators or in unloading functions. They are available in normally closed and normally open types. In addition, free reverse flow and fast response versions are available.

Normally Closed Poppet
Normally closed two way poppet valves act as a check valve when de-energized, blocking flow from one direction and allowing restricted free flow in the reverse condition. When energized, the poppet lifts allowing free flow from the side to the nose of the cartridge. Should the application require free flow in both directions, the free reverse flow option should be chosen.

OPERATION - The valve pilot is held on its seat by spring force, blocking pilot flow. This allows pressure at the inlet (port 2) to hold the poppet on its seat, thus, preventing flow through the valve (2-1). If the nose of the cartridge (port 1) is pressurized, the pressure will overcome the spring force, pushing the poppet off of its seat, allowing free flow through the cartridge (1-2). When the coil is energized, the valve pilot is pulled off of its seat. This vents the pressure inside the poppet to port 1, creating a pressure imbalance across the main poppet. This differential lifts the poppet allowing flow from the side to nose (2-1). Since poppet valves are piloted operated, a minimum amount of pressure differential (25-50 psi) and flow between ports 2 and 1 must be present to overcome the spring and lift the poppet.

Normally Open Poppet
Normally open two way poppet valves, when de-energized, allow free flow from the side (port 2) of the cartridge to the nose (port 1). Flow in the reverse direction is restricted. Should free flow be required in both directions, the free reverse flow option should be specified. Once the coil is energized the normally open poppet valve acts as a check valve, blocking flow from one direction and allowing restricted free flow in the reverse condition.

OPERATION - The valve pilot is held off its seat by spring force. Pilot flow is vented to port 1, creating a pressure imbalance that moves the main poppet. This differential lifts the poppet allowing flow from the side to nose (2-1). Since poppet valves are piloted operated, a minimum amount of pressure differential (25-50 psi) between ports 2 and 1 must be present to overcome the spring and lift the poppet. When the coil is energized, the coil force overcomes the spring force to drive the valve pilot and main poppet into their seats, thus blocking flow from port 2-1. If the nose of the cartridge (port 1) is pressurized, the pressure will overcome the spring force and solenoid force, pushing the poppet off of its seat, allowing restricted flow through the cartridge (1-2).
Free Reverse Flow

The free reverse flow versions are available on both the normally closed and normally open poppet valves. As mentioned above, the operation is the same as the standard poppet valve except flow through the reverse direction is not restricted. The free reverse flow option is only needed if the application requires flow to pass through the cartridge valve from the nose to side (port 1 to port 2).

Fast Response

Since poppet valves are pilot operated valves, a few milliseconds are needed to move the pilot and allow the poppet to lift. Should a faster response time be required on normally closed poppet valves, this option can be chosen. The fast response is accomplished by reducing the movement of the pilot. Thus, the flow capacity of the poppet valve is also decreased.

Two Way Spool Valves

Two way spool valves are direct acting, fast responding solenoid actuated valves. Like the poppet valves described earlier, they block the flow of a two way function. Unlike two way poppet valves, spool valves block flow from both the side port and the nose port. They do not have the check like function of the poppet valve, thus they are either open or closed. Spool valves are directed operated, so they respond more quickly to coil voltage than poppet valves. Spool valves operate via a sliding spool, thus, some leakage will be present due to the required spool clearance. Spool valves block flow in both directions, but the preferred flow path is still from the side of the cartridge to the nose due to the flow forces acting on the spool. Two way spool valves are available in normally open and normally closed types.

Normally Closed Spool

When de-energized, the spool is positioned by the spring force to cover both the side (2) and nose (1) ports of the valve. Thus, no flow is allowed from either direction. Once the coil is energized, the spool shifts exposing a flow path between the two ports. Flow can then be passed through the valve from either direction.

Normally Open Spool

When de-energized, the spool is positioned by the spring force so that a flow path between the side (2) and nose (1) ports is exposed, allowing flow through the valve from either direction. Once the coil is energized, the spool shifts to cover both the side (2) and nose (1) ports of the valve. Thus, no flow is allowed from either direction.
Bi-Directional Poppet Valve

Bi-directional poppet valves combine the dual blocking function of spool valves with the lower leakage capabilities of poppet valves. These valves also have a limited flow capacity compared to standard poppet or spool valves.

Two Position, Three Way Spool Valve

Three way spool solenoid valves provide directional control of flow. Each three way valve has a special internal spool which connects two of the three valve ports. When actuated, the spool connects a different combination of valve ports. These valves are often used for raise and lower functions of a single acting cylinder, control of a uni-directional motor, or as a circuit selector.

OPERATION - In the de-energized mode, the spool is positioned by spring force. When energized, the coil force directly shifts the spool against the spring, thus changing the flow through the valve. Each spool type can be used as a normally open, normally closed, or selector valve. To explain this we will review the DSL103A which is pictured here. When the valve is de-energized, ports 1 and 2 are open to one another. When energized, ports 1 and 3 are connected.

Thus, if we use port 3 as our pressure port, we have a normally closed valve. The pressure port (3) is blocked, while the actuator port (1) is drained to tank (2).

If we use port 2 as our pressure port, we have a normally open valve. The pressure port (2) is connected to the actuator port (1), and the tank port (3) is blocked.

If we use port 1 as our pressure port, we have a selector valve. The pressure port (1) is either connected to port (2) or port (3). Thus, it is “selecting” which port will get the system pressure and flow.

Note that in all three examples, we were using the same valve. The flow forces acting on the spool change depending on which port is pressurized. Thus, if you will be shifting the three way valve under full flow and pressure, it is important to review the shift limit characteristics for the flow paths you have chosen to be sure the coil has enough force to shift the spool. Various spools are available in this catalog to maximize the flow and pressure capacities for the desired flow function.
**Solenoid Valves**

**Two Position, Four Way Spool Valve**

Four way spool solenoid valves provide directional control of flow. Each four way valve has a special internal spool which connects some combination of the four valve ports together. When actuated, the spool connects a different combination of valve ports. These valves are often used for the raise / lower function of a double acting cylinder, or as a forward / reverse function of bi-directional motors.

**OPERATION** - In the de-energized mode, the spool is positioned by spring force. When energized, the coil force directly shifts the spool against the spring, thus changing the flow through the valve. Each spool type is customized to provide the flow combination desired. The flow forces acting on the spool change depending on which port is pressurized. Thus, if you will be shifting the four way valve under full flow and pressure, it is important to review the shift limit characteristics for the flow paths you have chosen to ensure the coil has enough force to shift the spool. Various spools are shown in this catalog to maximize the flow and pressure capacities for the desired flow function.

**Three Position, Four Way Spool Valve**

Three position, four way spool solenoid valves provide directional control of flow. Each four way valve has a special internal spool which connects some combination of the four ports together. When one coil is actuated, the spool connects a different combination of valve ports. When the other coil is actuated a third combination of valve ports are connected. These valves are often used for the raise / lower function of a double acting cylinder, or as a forward / reverse function of bi-directional motors.

**OPERATION** - In the de-energized mode, the spool is positioned by spring force. When energized, the coil force directly shifts the spool against the spring, thus changing the flow through the valve. Each spool type is customized to provide the flow combination desired. The flow forces acting on the spool change depending on which port is pressurized. Thus, if you will be shifting the four way valve under full flow and pressure, it is important to review the shift limit characteristics for the flow paths you have chosen to ensure the coil has enough force to shift the spool. Various spools are shown in this catalog to maximize the flow and pressure capacities for the desired flow function.
General Description
2-Way, 2 Position, Normally Closed Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>13 LPM (3.5 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>82 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
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<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
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<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
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<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.14 kg (.31 lbs.)</td>
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<td>Cavity</td>
<td>C09-2 (See BC Section for more details)</td>
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Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Operating Limits (Measured at 75% of Nominal Current)
# Spool Type, 2-Way Valve

## Series GS02 22

### Technical Information

#### Dimensions  Millimeters (Inches)

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Body Material</th>
<th>Port Size</th>
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<tbody>
<tr>
<td></td>
<td>High Pressure</td>
<td>None</td>
<td></td>
<td></td>
<td>Without Coil</td>
<td>12 VDC</td>
<td>Steel</td>
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<tr>
<td></td>
<td></td>
<td>Manual Override</td>
<td></td>
<td></td>
<td>Without Coil</td>
<td>24 VDC</td>
<td>Aluminum</td>
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<tr>
<td></td>
<td></td>
<td>Detented</td>
<td></td>
<td></td>
<td>Super Coil</td>
<td>120 VAC, 60/50 Hz</td>
<td>Aluminum</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>240 VAC, 60/50 Hz*</td>
<td>Aluminum</td>
<td></td>
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</tbody>
</table>

#### Ordering Information

- **GS02**
- **22**
- **09** Size Solenoid Valve
- **Style Normally Closed**
- **Override Option**
- **Screen**
- **Seals**
- **Coil Type**
- **Coil Voltage**
- **Coil Termination**
- **Body Material**
- **Port Size**

**Code**: N
- **Seals / Kit No.**
  - Nitrile / Buna-N (Std.)
  - Fluorocarbon

**Code**: V
- **Coil Type**
  - Without Coil
  - Super Coil - 19 Watts

**Code**: C
- **Coil Termination**
  - Without Coil With Leads
  - DIN Plug Face

**Code**: A
- **Coil Termination**
  - Amp Jr. Timer

**Code**: S
- **Coil Termination**
  - Dual Spade

**Code**: L
- **Coil Termination**
  - Dual Lead Wire

**Code**: LS
- **Coil Termination**
  - Sealed Lead Wire

**Code**: H
- **Coil Termination**
  - Molded Deutsch

See Super Coil 1/2" I.D. Information For Terminal Connectors

**Code**: Omit
- **Body Material**
  - Steel
  - Aluminum

**Code**: 6T
- **Port Size**
  - SAE-6 (B09-2-6T)

**Code**: 6B
- **Port Size**
  - 3/8" BSPG (B09-2-6B)

*Add "A" for aluminum, omit for steel.† Steel body only.

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**Parker Hannifin Corporation**

Hydraulic Cartridge Systems
General Description

2-Way, 2 Position, Normally Open Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
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<tbody>
<tr>
<td>Rated Flow (At 70 PSI)</td>
<td>15 LPM (4 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>82 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
</tbody>
</table>
| Operating Temp. Range/Seals      | -40°C to +93.3°C (Nitrile) (-40°F to +200°F)  
|                                  | -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F) |
| Fluid Compatibility/Viscosity    | Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt) |
| Filtration                       | ISO Code 16/13, SAE Class 4 or better |
| Approx. Weight                   | .14 kg (.31 lbs.)                 |
| Cavity                           | C09-2 (See BC Section for more details) |

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Operatin Limits (Measured at 75% of Nominal Current)
Spool Type, 2-Way Valve
Series GS02 27

Dimensions  Millimeters (Inches)

Ordering Information

Code Style
27 High Pressure (SP Coil)

Code Override Options
0 None
1 Manual Override
2 Detented Override Part No. 900690

Code Screen
0 None

Code Seals / Kit No.
N Nitrile / Buna-N (Std.) (SK30076N-1)
V Fluorocarbon / (SK30076V-1)

Code Coil Type
Omit Without Coil
SP Super Coil - 19 Watts

Code Coil Voltage
Omit Without Coil
D012 12 VDC
D024 24 VDC
A120 120 VAC, 60/50 Hz
A240 240 VAC, 60/50 Hz

Code Coil Termination
Omit Without Coil
C Conduit With Leads
D DIN Plug Face
A Amp Jr. Timer*
S Dual Spade*
L Dual Lead Wire*
LS Sealed Lead Wire*
H Molded Deutsch*

Code Body Material
Omit Steel
A Aluminum

Code Port Size Body Part No.
Omit Cartridge Only
6T SAE-6 (B09-2-*6T)
6B 3/8" BSPG (B09-2-6B)†

* Add "A" for aluminum, omit for steel.
† Steel body only.
General Description
4-Way, 2 Position, Reversing Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Designed to operate double and single acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capacity to 350 Bar (5000 PSI)
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>19 LPM (5 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td></td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp/Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.30 kg (.66 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-4 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>Pressure Drop (Bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>3.5</td>
</tr>
<tr>
<td>2</td>
<td>7.0</td>
</tr>
<tr>
<td>3</td>
<td>10.5</td>
</tr>
<tr>
<td>4</td>
<td>14.0</td>
</tr>
</tbody>
</table>

Operating Limits (Measured at 75% of Nominal Current)

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>Pressure (Bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>350</td>
</tr>
<tr>
<td>1</td>
<td>500</td>
</tr>
<tr>
<td>2</td>
<td>600</td>
</tr>
<tr>
<td>3</td>
<td>700</td>
</tr>
<tr>
<td>4</td>
<td>800</td>
</tr>
<tr>
<td>5</td>
<td>900</td>
</tr>
</tbody>
</table>
Spool Type, 4-Way Valve
Series GS02 42

Dimensions  Millimeters (Inches)

Ordering Information

<table>
<thead>
<tr>
<th>Code</th>
<th>Override Options</th>
<th>Style</th>
<th>Overwrite Option</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>None</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td>Without</td>
<td>12 VDC</td>
<td>Screw to Operate</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Manual Override</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Conduit</td>
<td>D012</td>
<td>Omit</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Detented</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Super Coils</td>
<td>D024</td>
<td>With Leads</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See Super Coil 1/2" I.D. Information For Terminal Connectors

Coil Type

- Without Coil
- Conduit With Leads
- DIN Plug Face
- Amp Jr. Timer*
- Dual Spade*
- Dual Lead Wire*
- Sealed Lead Wire*
- Molded Deutsch*

*DC Only

Body Material

- Steel
- Aluminum

* Add "A" for aluminum, omit for steel.

See Super Coil 1/2" I.D. Information For Terminal Connectors

Ordering Information

GS02 42

8 Size Solenoid Valve

<table>
<thead>
<tr>
<th>Code</th>
<th>Seals / Kit No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Nitrile / Buna-N (Std.) (SK30078V-1)</td>
</tr>
<tr>
<td>V</td>
<td>Fluorocarbon / (SK30078V-1)</td>
</tr>
</tbody>
</table>

See Super Coil 1/2" I.D. Information For Terminal Connectors

Technical Data

Parker Hannifin Corporation
Hydraulic Cartridge Systems
General Description

2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- Replaceable, one piece encapsulated, coils with minimal amperage draw
- Variety of coil terminations and voltages
- Variety of manual override options available
- Fast response available, (CH and CHR) rated at 15 LPM (4.0 GPM)
- Polyurethane “D”-Ring eliminates need for backup rings
- Spherical poppet for low leakage
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Rated Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>(At 70 PSI AP)</td>
</tr>
</tbody>
</table>

| Maximum Inlet |
| Pressure      | 250 Bar (3600 PSI) |

| Leakage at |
| 150 SSU (32 cSt) | 5 drops/min. (.33 cc/min.) |

| Minimum |
| Operating Voltage | 85% of rated voltage at 20°C (72°F). |

| Response Time |
| C, CR | Energized 50 ms  De-Energized 50 ms |
| CH, CHR | Energized 30 ms  De-Energized 50 ms |
| N, NR | Energized 50 ms  De-Energized 40 ms |

| Cartridge Material | All parts steel. All operating parts hardened steel. |

| Operating Temp. |
| Range/Seals     | -45°C to +93.3°C (“D”-Ring) (-50°F to +200°F) |
|                 | -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F) |

| Fluid |
| Compatibility/Viscosity | Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt) |

| Filtration | ISO Code 16/13, SAE Class 4 or better |

| Approx. Weight | .11 kg (.25 lbs.) |

| Cavity | C08-2 (See BC Section for more details) |

| Form Tool |
| Rougher Finisher | NFT08-2F |

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Normally Closed

Normally Open
Poppet Type, 2-Way Valve  
Series DSL081

Catalog HY15-3502/US
Technical Information

Dimensions  Millimeters (Inches)

See Super Coil 1/2" I.D.
Information For Terminal Connectors

7/8 Hex.
31-37 Nm (23-27 lb. ft.)
Torque

3/4-16 UNF-2A Thread

Ordering Information

DSL081 08 Size Solenoid Valve  Style Override Option Seals Screen Coil Type Coil Voltage Coil Termination Diode Body Material Port Size

Code / Style

C  Normally Closed  Metered reverse flow
CH  Normally Closed  Metered reverse flow (Fast response)
CHR  Normally Closed  Full reverse flow (Fast response)
CR  Normally Closed  Free reverse flow
N  Normally Open  Metered reverse flow
NR  Normally Open  Free reverse flow

Code Override Options

Omit  None
E  Push Type with Extended Rod (N.O. Only)
M  Push Type with Flush Rod (N.O. Only)
P  Pull & Release (N.C. Only)
T  Push & Twist (N.C. & N.O.)

Code Seals / Kit No.

Omit  "O"-Ring / (SK08-2)
N  Nitrile / (SK08-2N)
V  Fluorocarbon / (SK08-2V)

Code Screen

Omit  None
S  Screen

Code Coil Voltage

Omit  Without Coil
D012  12 VDC
D024  24 VDC
A120  120/110 VAC, 60/50 Hz
A240  240/220 VAC, 60/50 Hz

Code Coil Type

Omit  Without Coil
SP  Super Coil - 19 Watts

*Recommended

Code Diode

Omit  None
R  Diode

Code Body Material

Omit  Steel
A  Aluminum

Code Port Size Body Part No.

Omit  Cartridge Only
4P  1/4" NPTF  (808-2-4P)
6P  3/8" NPTF  (808-2-6P)
4T  SAE-4  (808-2-4T)
6T  SAE-6  (808-2-6T)
6B  3/8" BSPG (808-2-6B)

* Add "A" for aluminum, omit for steel.

Parker Hannifin Corporation
Hydraulic Cartridge Systems
General Description

2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- Replaceable, one piece encapsulated, coils with minimal amperage draw
- Variety of coil terminations and voltages
- Variety of manual override options available
- Fast response available, (CH and CHR) rated at 15 LPM (4.0 GPM)
- Polyurethane “D”-Ring eliminates need for backup rings
- Spherical poppet for low leakage
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>30 LPM (8 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized De-Energized</td>
</tr>
<tr>
<td></td>
<td>C, CR 50 ms 50 ms</td>
</tr>
<tr>
<td></td>
<td>CH, CHR 30 ms 50 ms</td>
</tr>
<tr>
<td></td>
<td>N, NR 50 ms 40 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (&quot;D&quot;-Ring) (-50°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.11 kg (.25 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-2 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher None</td>
</tr>
<tr>
<td></td>
<td>Finisher NFT08-2F</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Normally Closed

Normally Open
Dimensions  Millimeters (Inches)

7-10 Nm (5-7 lb. ft.) Torque

7/8 Hex. 43-49 Nm (32-36 lb. ft.) Torque

3/4-16 UNF-2A Thread

39.6 (1.56)
39.6 (1.56)
11.4 (.45)
12.6 (.50)

Ordering Information

DSH081

08 Size Solenoid Valve Style Override Option Seals Screen Coil Type Coil Voltage Coil Termination Diode Body Material Port Size

Poppet Type, 2-Way Valve Series DSH081

Catalog HY15-3502/US

Technical Information
General Description

2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- Fast response available, (CH and CHR) rated at 11 LPM (3.0 GPM)
- Polyurethane “D”-Ring
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Performance Curves</th>
<th>Pressure Drop vs. Flow (Through cartridge only)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Normally Closed</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Pressure Drop (P)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Flow (Q)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Hydraulic Oil 150 SSU @ 100°F (32 cSt)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specification</th>
<th>Normally Closed</th>
<th>Normally Open</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Flow</strong></td>
<td>60 LPM (15 GPM)</td>
<td>58 LPM (15 GPM)</td>
</tr>
<tr>
<td><strong>Maximum Inlet</strong></td>
<td>250 Bar (3600 PSI)</td>
<td>250 Bar (3600 PSI)</td>
</tr>
<tr>
<td><strong>Leakage at</strong></td>
<td>5 drops/min. (.33 cc/min.)</td>
<td>5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
<td>85% of rated voltage at 20°C (72°F).</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td><strong>Response Time</strong></td>
<td>C, CR 80 ms 150 ms</td>
<td>CH, CHR 50 ms 50 ms</td>
</tr>
<tr>
<td></td>
<td>N, NR 35 ms 175 ms</td>
<td>N, NR 35 ms 175 ms</td>
</tr>
<tr>
<td><strong>Cartridge Material</strong></td>
<td>All parts steel. All operating parts hardened steel.</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-45°C to +93.3°C (“D”-Ring)</td>
<td>-45°C to +93.3°C (“D”-Ring)</td>
</tr>
<tr>
<td><strong>Range/Seals</strong></td>
<td>(-50°F to +200°F)</td>
<td>(-50°F to +200°F)</td>
</tr>
<tr>
<td><strong>Fluid Compatibility/Viscosity</strong></td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td><strong>Filtration</strong></td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td><strong>Approx. Weight</strong></td>
<td>.20 kg (0.41 lbs.)</td>
<td>.20 kg (0.41 lbs.)</td>
</tr>
<tr>
<td><strong>Cavity</strong></td>
<td>C10-2 (See BC Section for more details)</td>
<td>C10-2 (See BC Section for more details)</td>
</tr>
<tr>
<td><strong>Form Tool</strong></td>
<td>Rougher Finisher</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>NFT10-2F</td>
<td>NFT10-2F</td>
</tr>
</tbody>
</table>
## Poppet Type, 2-Way Valve

### Series DSL101

#### Dimensions (Millimeters Inches)

<table>
<thead>
<tr>
<th>In (2)</th>
<th>Out (1)</th>
<th>7-10 Nm (5-7 lb ft.) Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.8</td>
<td>.62</td>
<td></td>
</tr>
</tbody>
</table>

#### Ordering Information

<table>
<thead>
<tr>
<th>DSL101 10 Size Solenoid Valve</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Screen</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Code/Style</strong></td>
<td>Omit</td>
<td>Push &amp; Twist M.O. (Normally Open Valves Only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>None</td>
<td>Normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH</td>
<td>None</td>
<td>Shifted</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>None</td>
<td>Normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td>None</td>
<td>Normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>None</td>
<td>Shifted</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>None</td>
<td>Normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Code/Style

- **C**: Normally Closed Metered reverse flow
- **CH**: Normally Closed Metered reverse flow (Fast response)
- **CR**: Normally Closed Free reverse flow (Fast response)
- **CR**: Normally Closed Free reverse flow
- **N**: Normally Open Metered reverse flow
- **NR**: Normally Open Free reverse flow

#### Override Options

- **E**: Push Type with Extended Rod (N.O. Only)
- **M**: Push Type with Flush Rod (N.O. Only)
- **P**: Pull & Release (N.C. Only)
- **T**: Push & Twist (N.C. & N.O.)

#### Seals/Kit No.

- **N**: Nitrile / (SK10-2N)
- **V**: Fluorocarbon / (SK10-2V)
- **"D"-Ring / (SK10-2)**

#### Screen

- **Omit**: None
- **S**: Screen

#### Code/Coil Type

- **C**: Coil Voltage
- **D**: DI N Plug Face
- **A**: Amp. Jr. Timert
- **S**: Dual Spade†
- **L**: Dual Lead Wire†
- **LS**: Sealed Lead Wire†
- **H**: Molded Deutsch†

### Recommended

- **SP**: Coil Termination
- **Omit**: Without Coil

- **V**: Conduit With Leads

- **A**: Dual Spade†

- **S**: Dual Lead Wire†

- **LS**: Sealed Lead Wire†

- **H**: Molded Deutsch†

#### Add for Aluminum. Omit for Steel.

- **‡**: Steel body only.

---

**Technical Data**

- **SH**: Check Valves
- **CL**: Shuttle Valves
- **LM**: Load/Motor Controls
- **GA**: Flow Controls
- **FC**: Pressure Controls
- **PC**: Logic Elements
- **ML**: Directional Controls
- **MV**: Manual Valves
- **SV**: Solenoid Valves
- **PV**: Proportional Valves
- **CE**: Coils & Electronics
- **BC**: Brakes & Clutches
- **SV**: Technical Data

**Parker Hannifin Corporation**

Hydraulic Cartridge Systems
### General Description

2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

### Features
- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- Fast response available, (CH and CHR) rated at 30 LPM (8 GPM)
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Flow</strong></td>
<td>60 LPM (15 GPM)</td>
</tr>
<tr>
<td><strong>Maximum Inlet Pressure</strong></td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td><strong>Leakage at 150 SSU (32 cSt)</strong></td>
<td>5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td><strong>Minimum Operating Voltage</strong></td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td><strong>Response Time</strong></td>
<td>C, CR: 80 ms De-Energized: 150 ms</td>
</tr>
<tr>
<td></td>
<td>CH, CHR: 50 ms De-Energized: 50 ms</td>
</tr>
<tr>
<td></td>
<td>N, NR: 70 ms De-Energized: 35 ms</td>
</tr>
<tr>
<td><strong>Cartridge Material</strong></td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td><strong>Operating Temp. Range/Seals</strong></td>
<td>-45°C to +93.3°C (&quot;D&quot;-Ring)</td>
</tr>
<tr>
<td></td>
<td>(-50°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
</tr>
<tr>
<td><strong>Fluid Compatibility/Viscosity</strong></td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td><strong>Filtration</strong></td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td><strong>Approx. Weight</strong></td>
<td>.20 kg (0.41 lbs.)</td>
</tr>
<tr>
<td><strong>Cavity</strong></td>
<td>C10-2 (See BC Section for more details)</td>
</tr>
<tr>
<td><strong>Form Tool</strong></td>
<td>Rougher Finisher NFT10-2F</td>
</tr>
</tbody>
</table>

### Performance Curves

**Pressure Drop vs. Flow** (Through cartridge only)

#### Normally Closed

![Pressure Drop vs. Flow Graph](image)

#### Normally Open

![Pressure Drop vs. Flow Graph](image)
Technical Information

Poppet Type, 2-Way Valve
Series DSH101

Dimensions  Millimeters (Inches)

Ordering Information

**DSH101**
10 Size Solenoid Valve  Style  Override Option  Seals  Screen  Coil Type  Coil Voltage  Coil Termination  Diode  Body Material  Port Size

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>C</td>
<td>None</td>
<td></td>
<td>Without Coil</td>
<td></td>
<td>12 VDC</td>
<td></td>
<td>Steel</td>
<td></td>
<td>4P</td>
<td></td>
</tr>
<tr>
<td>CH</td>
<td>Push Type with Extended Rod (N.O. Only)</td>
<td></td>
<td>SP*</td>
<td></td>
<td>Super Coil - 28 Watts</td>
<td></td>
<td>Aluminum</td>
<td></td>
<td>6P</td>
<td></td>
</tr>
<tr>
<td>CHR</td>
<td>Push Type with Flush Rod (N.O. Only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8P</td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>Push &amp; Twist (N.C. &amp; N.O.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6T</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Omit “D”-Ring / (SK10-2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6B</td>
<td></td>
</tr>
<tr>
<td>NR</td>
<td>Nitrile / (SK10-2N)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>8T</td>
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<td>Fluorocarbon / (SK10-2V)</td>
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<td>T8T</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Omit None</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>6B</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Screen</td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

* Add “A” for aluminum. Omit for steel. † Steel body only.

*Recommended 120/110 VAC, 60/50 Hz

1/4” NPTF (B10-2-*4P)  3/8” NPTF (B10-2-*6P)  1/2” NPTF (B10-2-*8P)  SAE-6 (B10-2-*6T)  SAE-8 (B10-2-*8T)  SAE-8 (B10-2-T8T)  3/8” BSPG (B10-2-6B)
General Description
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>90 LPM (24 GPM)</td>
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<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>C, CR 100 ms 150 ms</td>
</tr>
<tr>
<td></td>
<td>CH, CHR 60 ms 60 ms</td>
</tr>
<tr>
<td></td>
<td>N, NR 70 ms 150 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile)</td>
</tr>
<tr>
<td></td>
<td>(-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.29 kg (.65 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C12-2 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher Finisher None</td>
</tr>
<tr>
<td></td>
<td>NFT12-2F</td>
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</tbody>
</table>

Performance Curves
Pressure Drop vs. Flow (Through cartridge only)

![Pressure Drop vs. Flow Graphs for Normally Closed and Normally Open Valves](image-url)
Poppet Type, 2-Way Valve

Series DSH121

Dimensions  Millimeters (Inches)

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td></td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHR</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>Free reverse flow</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NR</td>
<td></td>
<td>Free reverse flow</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Code / Style
- C: Normally Closed, Metered reverse flow
- CH: Normally Closed, Metered reverse flow (Fast response)
- CHR: Normally Closed, Full reverse flow (Fast response)
- CR: Normally Closed, Free reverse flow
- N: Normally Open, Metered reverse flow
- NR: Normally Open, Free reverse flow

Override Options
- E: Push Type with Extended Rod (N.O. Only)
- M: Push Type with Flush Rod (N.O. Only)
- T: Push & Twist (N.C. & N.O.)

Seals / Kit No.
- Nitrile / (SK12-2)
- Fluorocarbon / (SK12-2V)

Coil Voltage
- D012: 12 VDC
- D024: 24 VDC
- A120: 120/110 VAC, 60/50 Hz
- A240: 240/220 VAC, 60/50 Hz

SP*
- SP*: Super Coil - 28 Watts

Coil Type
- Without Coil
- Super Coil

Diode
- Without Coil
- Diode

Body Material
- Steel
- Aluminum

Port Size
- 1/4" NPTF (B12-2-*12P)
- SAE-8 (B12-2-*8T)
- SAE-12 (B12-2-*12T)

*Recommended

***Add "A" for aluminum, omit for steel.***
General Description
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- Fast response available, (CH) rated at 60 LPM (15 GPM)
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Feature Description</th>
<th>Specification Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>150 LPM (40 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>20 drops/min. (1.33 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time</td>
<td>C, CR: 50 ms, 130 ms</td>
</tr>
<tr>
<td></td>
<td>CH: 40 ms, 60 ms</td>
</tr>
<tr>
<td></td>
<td>N, NR: 45 ms, 75 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel, All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile)</td>
</tr>
<tr>
<td></td>
<td>(-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.34 kg (.75 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C16-2 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher Finisher None</td>
</tr>
<tr>
<td></td>
<td>NFT16-2F</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Normally Closed

![Pressure Drop vs. Flow Graph](image)

Normally Open

![Pressure Drop vs. Flow Graph](image)
### Technical Information

#### Poppet Type, 2-Way Valve

**Series DS161**

#### Dimensions

<table>
<thead>
<tr>
<th>Code / Style</th>
<th>Normally Closed</th>
<th>Normally Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3/4 Hex. 4.1 Nm (3 lb. ft.) Torque</td>
<td>1-1/2&quot; Hex. 54 Nm (40 lb. ft.) Torque</td>
</tr>
</tbody>
</table>

**Dimensions**

<table>
<thead>
<tr>
<th>Code</th>
<th>Seals / Kit. No.</th>
<th>Coil Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Nitrile / (SK16-2)</td>
<td>Omit Without Coil</td>
</tr>
<tr>
<td>V</td>
<td>Fluorocarbon / (SK16-2V)</td>
<td>12 VDC</td>
</tr>
</tbody>
</table>

**Ordering Information**

<table>
<thead>
<tr>
<th>Code</th>
<th>Override Options</th>
<th>Coil Watage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>None</td>
<td>Omit Without Coil</td>
<td>Omit Steel Material</td>
<td>Cartridge Only</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Push Type with Extended Rod (N.O. Only)</td>
<td>L 17 Watts</td>
<td>C Conduit (AC Only)</td>
<td>SAE-12 (B16-2-12T)</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Push Type with Flash Rod (N.O. Only)</td>
<td>H 30 Watts</td>
<td>D DIN Plug Face</td>
<td>SAE-16 (B16-2-16T)</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Pull &amp; Release (N.C. Only)</td>
<td></td>
<td>P Dual Spade (DC Only)</td>
<td>3/4&quot; BSPG (B16-2-12B)</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>Push &amp; Twist (N.C. Only)</td>
<td></td>
<td>S Dual Screw (DC Only)</td>
<td>1&quot; BSPG (B16-2-16B)</td>
<td></td>
</tr>
</tbody>
</table>

**Code Port Size**

- **12T** - SAE-12 (B16-2-12T)
- **16T** - SAE-16 (B16-2-16T)
- **12B** - 3/4" BSPG (B16-2-12B)
- **16B** - 1" BSPG (B16-2-16B)

Add “A” for aluminum, omit for steel. Steel body only.

---

See DS coil 5/8" I.D. Information For Terminal Connectors

---

**Technical Information**

**Dimensions**

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Coil Voltage</th>
<th>Coil Watage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>16 Size Solenoid Valve</td>
<td>Omit</td>
<td>None</td>
<td>Omit Without Coil</td>
<td>Omit Steel Material</td>
<td>Cartridge Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Push Type with Extended Rod (N.O. Only)</td>
<td>L 17 Watts</td>
<td>C Conduit (AC Only)</td>
<td>SAE-12 (B16-2-12T)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Push Type with Flash Rod (N.O. Only)</td>
<td>H 30 Watts</td>
<td>D DIN Plug Face</td>
<td>SAE-16 (B16-2-16T)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Pull &amp; Release (N.C. Only)</td>
<td></td>
<td>P Dual Spade (DC Only)</td>
<td>3/4&quot; BSPG (B16-2-12B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>Push &amp; Twist (N.C. Only)</td>
<td></td>
<td>S Dual Screw (DC Only)</td>
<td>1&quot; BSPG (B16-2-16B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Add “A” for aluminum, omit for steel. Steel body only.

---

**Coil Voltage**

- **Omit** Without Coil
- **D012** 12 VDC
- **D024** 24 VDC
- **A120** 120/110 VAC, 60/50 Hz
- **A240** 240/220 VAC, 60/50 Hz
Technical Information

Poppet Type, 2-Way Valve
Series DSH161

General Description
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- All external parts zinc plated
- New 350 Bar (5000 PSI) rating

NOTE:
This valve will be available January 1, 2011.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>150 LPM (40 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU</td>
<td>5 drops/min. (.3 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>C, CR: 50 ms, De-Energized: 130 ms</td>
</tr>
<tr>
<td></td>
<td>CH: 40 ms, 60 ms</td>
</tr>
<tr>
<td></td>
<td>N, NR: 45 ms, 75 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°F to +93.3°F (Nitrile)</td>
</tr>
<tr>
<td></td>
<td>(-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.34 kg (.75 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C16-2</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher None NFT16-2F</td>
</tr>
</tbody>
</table>

Performance Curves
Pressure Drop vs. Flow (Through cartridge only)

<table>
<thead>
<tr>
<th>Flow (Q) GPM</th>
<th>Pressure Drop (P) Bar</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0</td>
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<td>2</td>
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<td>190</td>
<td>20</td>
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</table>

Normally Closed

<table>
<thead>
<tr>
<th>Flow (Q) GPM</th>
<th>Pressure Drop (P) Bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
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<td>180</td>
<td>19</td>
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<tr>
<td>190</td>
<td>20</td>
</tr>
</tbody>
</table>

Normally Open

<table>
<thead>
<tr>
<th>Flow (Q) GPM</th>
<th>Pressure Drop (P) Bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
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<tr>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>50</td>
<td>6</td>
</tr>
<tr>
<td>60</td>
<td>7</td>
</tr>
<tr>
<td>70</td>
<td>8</td>
</tr>
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<td>80</td>
<td>9</td>
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<td>90</td>
<td>10</td>
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<td>100</td>
<td>11</td>
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<td>110</td>
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<td>120</td>
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<td>130</td>
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<td>140</td>
<td>15</td>
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<td>150</td>
<td>16</td>
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<td>160</td>
<td>17</td>
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<tr>
<td>170</td>
<td>18</td>
</tr>
<tr>
<td>180</td>
<td>19</td>
</tr>
<tr>
<td>190</td>
<td>20</td>
</tr>
</tbody>
</table>
Poppet Type, 2-Way Valve
Series DSH161

Dimensions  Millimeters (Inches)

Code / Style
C  Normally Closed
   Metered reverse flow
CH  Normally Closed
   Metered reverse flow
   (Fast response)
CR  Normally Closed
   Free reverse flow
N  Normally Open
   Metered reverse flow
NR  Normally Open
   Free reverse flow

Ordering Information

<table>
<thead>
<tr>
<th>Code / Style</th>
<th>Override Options</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>None</td>
<td>Omit</td>
<td>SP*</td>
<td>Omit</td>
<td>Without Coil</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>CH</td>
<td>Push Type with</td>
<td>Omit</td>
<td>SP*</td>
<td>Omit</td>
<td>Without Coil</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>Extended Rod</td>
<td>Omit</td>
<td>SP*</td>
<td>Omit</td>
<td>Without Coil</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Nitrile / Fluorocarbon</td>
<td>Omit</td>
<td>SP*</td>
<td>Omit</td>
<td>Without Coil</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>NR</td>
<td></td>
<td>Omit</td>
<td>SP*</td>
<td>Omit</td>
<td>Without Coil</td>
<td>Aluminum</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: This valve will be available January 1, 2011.
General Description

2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- Low hysteresis
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>260 LPM (70 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU</td>
<td>20 drops/min. (1.33 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time</td>
<td>C, CR: 350 ms 160 ms; N, NR: 300 ms 45 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°F to +93.3°F (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.34 kg (.75 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C20-2</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher Finisher NFT20-2F</td>
</tr>
</tbody>
</table>

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)
## Technical Information

### Dimensions

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Seals / Kit. No.</th>
<th>Coil Voltage</th>
<th>Coil Wattage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Out (1)</td>
<td>None</td>
<td>Nitrile / (SK30-2)</td>
<td>12 VDC</td>
<td>17 Watts</td>
<td>Without Coil</td>
<td>Steel</td>
<td>2B20-2-20T</td>
</tr>
<tr>
<td>CR</td>
<td>In (2)</td>
<td>Push Type with Extended Rod (N.O. Only)</td>
<td>Fluorocarbon / (SK20-2V)</td>
<td>24 VDC</td>
<td>30 Watts</td>
<td>Conduit (AC Only)</td>
<td>SAE-20</td>
<td>2B20-2-20B</td>
</tr>
<tr>
<td>N</td>
<td>Out (1)</td>
<td>Push Type with Flush Rod (N.O. Only)</td>
<td>Nitrile / (SK30-2)</td>
<td>120/110 VAC</td>
<td>60/50 Hz</td>
<td>Pull &amp; Release (N.C. Only)</td>
<td>Steel</td>
<td>2B20-2-20T</td>
</tr>
<tr>
<td>NR</td>
<td>In (2)</td>
<td>Pull &amp; Release (N.C. Only)</td>
<td>Fluorocarbon / (SK20-2V)</td>
<td>240/220 VAC</td>
<td>60/50 Hz</td>
<td>Push &amp; Twist (N.C. Only)</td>
<td>Steel</td>
<td>2B20-2-20B</td>
</tr>
</tbody>
</table>

### Ordering Information

#### DS201

- **20 Size**: Solenoid Valve
- **Style**: Normally Closed
- **Override Option**: Metered reverse flow
- **Seals / Kit. No.**: Nitrile / (SK30-2)
- **Coil Voltage**: 12 VDC
- **Coil Wattage**: 17 Watts
- **Coil Termination**: Without Coil
- **Body Material**: Steel
- **Port Size**: 2B20-2-20T

#### Code

- **Code**: C, CR, N, NR
- **Override Options**: None
- **Seals**: Nitrile / (SK30-2)
- **Coil Voltage**: 12 VDC
- **Coil Wattage**: 17 Watts
- **Coil Termination**: Without Coil
- **Body Material**: Steel
- **Port Size**: 2B20-2-20T

#### Code

- **Code**: C, CR, N, NR
- **Override Options**: Push Type with Extended Rod (N.O. Only)
- **Seals**: Fluorocarbon / (SK20-2V)
- **Coil Voltage**: 24 VDC
- **Coil Wattage**: 30 Watts
- **Coil Termination**: Conduit (AC Only)
- **Body Material**: Steel
- **Port Size**: SAE-20

#### Code

- **Code**: C, CR, N, NR
- **Override Options**: Push Type with Flush Rod (N.O. Only)
- **Seals**: Nitrile / (SK30-2)
- **Coil Voltage**: 120/110 VAC | 60/50 Hz
- **Coil Wattage**: 60/50 Hz
- **Coil Termination**: Pull & Release (N.C. Only)
- **Body Material**: Steel
- **Port Size**: 2B20-2-20T

#### Code

- **Code**: C, CR, N, NR
- **Override Options**: Pull & Release (N.C. Only)
- **Seals**: Fluorocarbon / (SK20-2V)
- **Coil Voltage**: 240/220 VAC | 60/50 Hz
- **Coil Wattage**: 60/50 Hz
- **Coil Termination**: Push & Twist (N.C. Only)
- **Body Material**: Steel
- **Port Size**: 2B20-2-20B

See DS coil 5/8” I.D.
Technical Information

General Description
2-Way Poppet Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Various coil terminations and voltages
- Various manual override options
- All external parts zinc plated
- New 250 Bar (3600 PSI) rating

NOTE: This valve will be available January 1, 2011.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI)</td>
<td>260 LPM (70 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>250 Bar (3600 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU</td>
<td>5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>C, CR 350 ms, N, NR 300 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range</td>
<td>-40°F to +93.3°C (Nitrile)</td>
</tr>
<tr>
<td></td>
<td>-40°F to +200°F (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.34 kg (.75 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C20-2 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher Finisher None NFT20-2F</td>
</tr>
</tbody>
</table>

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>0</th>
<th>20</th>
<th>40</th>
<th>60</th>
<th>80</th>
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<tbody>
<tr>
<td>LPM</td>
<td>0</td>
<td>76</td>
<td>151</td>
<td>227</td>
<td>303</td>
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<tr>
<td>PSI Bar</td>
<td>0</td>
<td>8</td>
<td>16</td>
<td>24</td>
<td>32</td>
</tr>
</tbody>
</table>

Hydraulic Oil 150 SSU @ 100°F (32 cSt)
Catalog HY15-3502/US

Technical Information

Poppet Type, 2-Way Valve

Series DSL201

**Dimensions**

Millimeters (Inches)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Dimensions (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Normally Closed Metered reverse flow</td>
<td>36.4 (1.43)</td>
</tr>
<tr>
<td>CR</td>
<td>Normally Closed Free reverse flow</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Normally Open Metered reverse flow</td>
<td></td>
</tr>
<tr>
<td>NR</td>
<td>Normally Open Free reverse flow</td>
<td></td>
</tr>
</tbody>
</table>

**Ordering Information**

**DSL201**

20 Size Solenoid Valve

Style Override Option Seals Coil Type Coil Voltage Coil Termination Body Material Port Size

Parker Hannifin Corporation
Hydraulic Cartridge Systems

**NOTE:** This valve will be available January 1, 2011.
Poppet Type, 2-Way Valve
Series GH02 01

General Description

2-Way, 2 Position, Normally Closed Poppet Valve With Flow Control Adjustment. This valve maintains constant flow at $\Delta P \geq 20$ Bar (300 PSI) regardless of load pressure changes upstream of the valve at port 2.

Features

- Light weight alloy housing with hardened steel moving parts
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI $\Delta P$)</td>
<td>9.5 LPM (2.5 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>High Pressure</td>
</tr>
<tr>
<td></td>
<td>285 Bar (4000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>Open 20 ms, Close 25 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile)</td>
</tr>
<tr>
<td></td>
<td>(-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.09 kg (.19 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-2 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

(Through cartridge only)

Pressure Compensation For Different Flow Settings

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>GPM</th>
<th>LPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1.0</td>
<td>0.5</td>
<td>1.5</td>
</tr>
<tr>
<td>2.0</td>
<td>1.0</td>
<td>3.0</td>
</tr>
<tr>
<td>3.0</td>
<td>1.5</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Reverse Flow

<table>
<thead>
<tr>
<th>Pressure Drop</th>
<th>0</th>
<th>140</th>
<th>210</th>
<th>280</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSI</td>
<td>0</td>
<td>100</td>
<td>140</td>
<td>210</td>
</tr>
</tbody>
</table>

Filtration

ISO Code 16/13, SAE Class 4 or better

Approx. Weight

.09 kg (.19 lbs.)

Cavity

C08-2 (See BC Section for more details)
Poppet Type, 2-Way Valve
Series GH02 01

Dimensions  Millimeters (Inches)

Flow Adjustment CW To Decrease CCW To Increase

See Super Coil 1/2" I.D. Information For Terminal Connectors

Ordering Information

GH02 01

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Solenoid Valve</td>
<td>Normally Closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Code Screen

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>High Pressure (*SP Coil)</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Code Coil Voltage

<table>
<thead>
<tr>
<th>Code</th>
<th>Coil Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>D012</td>
<td>12 VDC</td>
</tr>
<tr>
<td>D024</td>
<td>24 VDC</td>
</tr>
<tr>
<td>A120</td>
<td>120 VAC, 60/50 Hz</td>
</tr>
<tr>
<td>A240</td>
<td>240 VAC, 60/50 Hz</td>
</tr>
</tbody>
</table>

See Super Coil 1/2" I.D. *DC Only

* Add "A" for aluminum, omit for steel.

Technical Data

Parker Hannifin Corporation
Hydraulic Cartridge Systems
Bi-Directional Poppet Type, 2-Way Valve
Series GS02 72/73

General Description


Features

- Fast Response
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI ΔP)</td>
<td>1 LPM (0.26 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>210 Bar (3000 PSI)</td>
</tr>
</tbody>
</table>
| Leakage at 150 SSU (32 cSt) | 72 5 drops/min. (.33 cc/min.)
| | 73 Zero Drops Soft (Delrin) Seat |
| Minimum Operating Voltage | 85% of rated voltage at 20°C (72°F). |
| Response Time | Open 10 ms
| | Close 10 ms |
| Cartridge Material | All parts steel. All operating parts hardened steel. |
| Operating Temp. Range/Seals | -40°C to +93.3°C (Nitrile)
| | (-40°F to +200°F)
| | -31.7°C to +121.1°C (Fluorocarbon)
| | (-25°F to +250°F) |
| Fluid Compatibility/Viscosity | Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt) |
| Filtration | ISO Code 16/13, SAE Class 4 or better |
| Approx. Weight | .14 kg (.31 lbs.) |
| Cavity | C08-2 (See BC Section for more details) |

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

Hydraulic Oil 150 SSU @ 100°F (32 cSt)
Bi-Directional Poppet Type, 2-Way Valve
Series GS02 72/73

Dimensions  Millimeters (Inches)

Ordering Information

Code | Style | Override Options | Screen | Seals | Coil Type | Coil Voltage | Coil Termination | Body Material | Port Size
---|---|---|---|---|---|---|---|---|---
GS02 | 08 Size Solenoid Valve | Normally Closed | | | | | | | |
Code | Style | Override Options | Screen | Seals | Coil Type | Coil Voltage | Body Material | Port Size
---|---|---|---|---|---|---|---|---
72 | Standard (‘SP’ Coil) | None | None | | | | Steel | |
73 | Zero Drops (‘SP’ Coil) | None | None | | | | Aluminum | |

See Super Coil 1/2” I.D. Information For Terminal Connectors

See Super Coil 1/2” I.D. Information For Terminal Connectors

*Add “A” for aluminum, omit for steel.

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Parker Hannifin Corporation
Hydraulic Cartridge Systems
General Description
2-Way, 2 Position, Normally Closed, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications
<table>
<thead>
<tr>
<th>Rated Flow (At 70 PSI ΔP)</th>
<th>2 to 1</th>
<th>34 LPM (9 GPM)</th>
<th>1 to 2</th>
<th>19 LPM (5 GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Inlet Pressure</td>
<td>80</td>
<td>210 Bar (3000 PSI)</td>
<td>81</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>5 drops/min. (.33 cc/min.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>Open</td>
<td>40 ms</td>
<td>Close</td>
<td>40 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile)</td>
<td>(-40°F to +200°F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.14 kg (.31 lbs.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-2 (See BC Section for more details)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Performance Curve
Pressure Drop vs. Flow (Through cartridge only)

---

Parker Hannifin Corporation
Hydraulic Cartridge Systems
Catalog HY15-3502/US

Bi-Directional Poppet Type, 2-Way Valve
Series GS02 80/81

Technical Information

Dimensions  Millimeters (Inches)

Stroke 3.0 - (0.12) Detented
2.7 - (0.10) Non-detented

Manual Override (Twist to Operate)

1/4-28 Female Thread

3/4 Hex. 4.1 Nm (3 lb. ft.) Torque

Cable interface m.o. option 13/32 Hex.

3/4-16 UNF Thread

See Super Coil 1/2" I.D. Information For Terminal Connectors

Ordering Information

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Seals / Kit No.</th>
<th>Coil Terminalization</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>Standard (&quot;SS&quot; Coil)</td>
<td>Nitrile / Buna-N (Std.) (SK30088N-1)</td>
<td>Without Coil Conduit With Leads DIN Plug Face Amp Jr. Timer* Dual Spade* Dual Lead Wire* Sealed Lead Wire* Molded Deutsch*</td>
<td>Omit Steel</td>
<td>Cartridge Only</td>
</tr>
<tr>
<td>81</td>
<td>High Pressure (&quot;SP&quot; Coil)</td>
<td></td>
<td></td>
<td>Aluminum</td>
<td>6T SAE-6 (B08-2-6T)</td>
</tr>
</tbody>
</table>

* Add "A" for aluminum, omit for steel.

<table>
<thead>
<tr>
<th>Code</th>
<th>Override Options</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Body Material</th>
<th>Port Size</th>
<th>Body Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>0</td>
<td>None</td>
<td>Omit</td>
<td>Without Coil</td>
<td>Omit Cartridge Only</td>
<td>6T SAE-6 (B08-2-6T)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Detented</td>
<td></td>
<td></td>
<td>SS</td>
<td>Super Coil - 14 Watts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Non-Detented</td>
<td></td>
<td></td>
<td>SP</td>
<td>Super Coil - 19 Watts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cable Interface</td>
<td></td>
<td></td>
<td>C</td>
<td>12 VDC</td>
<td>Cartridge Only</td>
<td>6T SAE-6 (B08-2-6T)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>210 Bar (3000 PSI)</td>
<td>120 VAC, 60/50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*22 Watts

Parker Hannifin Corporation
Hydraulic Cartridge Systems

SV36
General Description

2-Way, 2 Position, Normally Closed, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Coil is interchangeable with 02 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Cartridge Material</th>
<th>All parts steel. All operating parts hardened steel.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>2 to 1 68 LPM (18 GPM) 1 to 2 46 LPM (12 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>80 Bar (3000 PSI) 81 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Response Time</td>
<td>See Performance Curves</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.17 kg (.37 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>2R (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Response Time vs. Flow
Bi-Directional Poppet Type, 2-Way Valve
Series GS04 80/81

Dimensions Millimeters (Inches)

1/4-28 Female Thread
Cable interface m.o. option 13/32 Hex.
3/4 Hex. 4.1 Nm (3 lb. ft.) Torque
1 Hex. 34 Nm (25 lb. ft.) Torque
7/8-14 UNF Thread

NOTE: Requires 2R Cavity

Ordering Information

Code | Style | Override Options | Screen | Seals | Coil Type | Coil Voltage | Coil Termination
---|---|---|---|---|---|---|---
GS04 | 10 Size Solenoid Valve | Style Normally Closed | Overridption | Screen | Seals | Coil Type | Coil Voltage
---|---|---|---|---|---|---|---
80 | Standard ("SS" Coil) | 0 None | N Nitrile / Buna-N (Std.) (SK30113N-1) | Omit | Without Coil | 12 VDC | Without Coil
81 | High Pressure ("SP" Coil) | 1 Detented | SS Super Coil - 14 Watts | SS Super Coil - 19 Watts | 24 VDC | Without Coil | 12 VDC
| | 2 Non-Detented | | | | | | 24 VDC
| | 3 Cable Interface | | | | | | 24 VDC

Order Bodies Separately

Code Porting Body Material
---|---|---
LB10 | 543 1/2" SAE | A Aluminum
| 545 1/2" BSP | S Steel

Parker Hannifin Corporation
Hydraulic Cartridge Systems
General Description
2-Way, 2 Position, Normally Closed, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Coil is interchangeable with 02 and 04 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>190 LPM (50 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>80 Bar (3000 PSI)</td>
</tr>
<tr>
<td></td>
<td>81 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>9 drops/min. (.58 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>See Performance Curves</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to +93.3°C (Nitrile)</td>
</tr>
<tr>
<td></td>
<td>-40°F to +200°F</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>-25°F to +250°F</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>0.4 kg (.88 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C16-2 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Response Time vs. Flow
Bi-Directional Poppet Type, 2-Way Valve
Series GS06 80/81

Dimensions  Millimeters (Inches)

| Stroke          | 3.0 - (0.12) Det. 2.7 - (0.10) Non-det. |
| Manual Override | (Twist to Operate) |
| 1/4-28 Female Thread |
| 3/4 Hex. 4.1 Nm (3 lb. ft.) Torque |
| 1-1/2 Hex. 108 lb. ft. Torque |
| 1-5/16-12 UNF Thread |

Ordering Information

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS06</td>
<td>16 Size</td>
<td>80 Standard (‘SS’ Coil) 81 High Pressure (‘SP’ Coil)</td>
<td>0 None</td>
<td>1 Detent</td>
<td>2 Non-Detent</td>
<td>3 Cable Interface</td>
<td>210 Bar (3000 PSI)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Nitrile / Buna-N (Std.)</td>
<td>SS</td>
<td>Without Coil</td>
<td>Omit</td>
<td>Without Coil</td>
<td>Omit</td>
<td>Cartridge Only</td>
<td>16T</td>
<td>SAE-16</td>
<td>(B16-2-16T)</td>
</tr>
<tr>
<td>V</td>
<td>Fluorocarbon / (SK30089V-1)</td>
<td>Super Coil - 14 Watts</td>
<td>DIN Plug Face</td>
<td>A</td>
<td>Amp Jr. Timer*</td>
<td>L</td>
<td>1/2&quot; I.D.</td>
<td>16B</td>
<td>1&quot; BSPG</td>
<td>(B16-2-16B)†</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Termination</th>
<th>Code</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Conduit With Leads</td>
<td>D012</td>
<td>12 VDC</td>
</tr>
<tr>
<td>D</td>
<td>DIN Plug Face</td>
<td>D024</td>
<td>24 VDC</td>
</tr>
<tr>
<td>A</td>
<td>Amp Jr. Timer*</td>
<td>A120</td>
<td>120 VAC, 60/50 Hz</td>
</tr>
<tr>
<td>S</td>
<td>Dual Spade*</td>
<td>A240</td>
<td>240 VAC, 60/50 Hz*</td>
</tr>
<tr>
<td>L</td>
<td>Dual Lead Wire*</td>
<td>See Super Coil 1/2&quot; I.D.</td>
<td></td>
</tr>
<tr>
<td>LS</td>
<td>Sealed Lead Wire*</td>
<td>*Add “A” for aluminum. Omit for steel.</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Housed Deutsch*</td>
<td>†Steel body only.</td>
<td></td>
</tr>
</tbody>
</table>

*22 Watts
General Description


Features

- Fast Response
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>1 LPM (0.26 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>77 5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td>78 Zero Drops Soft (Delrin) Seat</td>
<td></td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>Open 10 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.14 kg (.31 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-2 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curve

Pressure Drop vs. Flow (Through cartridge only)

<table>
<thead>
<tr>
<th>Pressure Drop</th>
<th>Flow (Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSI Bar</td>
<td>LPM</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0.37</td>
</tr>
<tr>
<td>8</td>
<td>0.74</td>
</tr>
<tr>
<td>12</td>
<td>1.01</td>
</tr>
<tr>
<td>16</td>
<td>1.48</td>
</tr>
<tr>
<td>20</td>
<td>1.85</td>
</tr>
<tr>
<td>24</td>
<td>2.22</td>
</tr>
</tbody>
</table>

Hydraulic Oil 150 SSU @ 100°F (32 cSt)
Bi-Directional Poppet Type, 2-Way Valve
Series GS02 77/78

Dimensions  Millimeters (Inches)

Ordering Information

GS02

88 Size Solenoid Valve

Style

Override Option

Screen

Seals

Coil Type

Coil Voltage

Coil Termination

Body Material

Port Size

Code| Style| Override Options
---|---|---
77| Standard ("SP" Coil)| None
78| Zero Drops ("SP" Coil)| Manual Override

Code| Override Options
---|---
0| None
1| Manual Override
2| Detented Override (Part No. 900690)

See Super Coil 1/2" I.D.

Information For Terminal Connectors

3/4 Hex.

4.1 Nm (3 lb. ft.) Torque

3/4-16 UNF Thread

Manual Override Option

(Screw to Operate)

Detented Manual Override Option

(Screw to Operate)

7/8 Hex.

30 Nm (22 lb. ft.) Torque

See Super Coil

1/2" I.D.

Information For Terminal Connectors

N| Nitrile / Buna-N (Std.) (SK30088V-1)
V| Fluorocarbon / (SK30088V-1)

Code| Seals / Kit No.
---|---

Code| Coil Type
---|---
Omit| Without Coil
SP| Super Coil - 19 Watts

Code| Coil Type
---|---
SP| Super Coil - 19 Watts

Code| Coil Voltage
---|---
D012| 12 VDC
D024| 24 VDC
A120| 120 VAC, 60/50 Hz
A240| 240 VAC, 60/50 Hz

Code| Body Material
---|---
Omit| Steel
A| Aluminum

Code| Port Size Body Part No.
---|---
Omit| Cartridge Only
6T| SAE-6 (B08-2-*6T)
6B| 3/8" BSPG (B08-2-*6B)

*22 Watts

See Super Coil 1/2" I.D.
* Add "A" for aluminum, omit for steel.
Catalog HY15-3502/US
Parker Hannifin Corporation
Hydraulic Cartridge Systems

Check Valves
Shuttle Valves
Load/Motor Controls
Flow Controls
Pressure Controls
Logic Elements
Directional Controls
Manual Valves
Solenoid Valves
Proportional Valves
Coils & Electronics
Bodies & Cavities
Technical Data

General Description
2-Way, 2 Position, Normally Open, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Coil is interchangeable with 04 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Rated Flow (At 70 PSI ΔP)</th>
<th>2 to 1 34 LPM (9 GPM)</th>
<th>1 to 2 19 LPM (5 GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Inlet Pressure</td>
<td>85 210 Bar (3000 PSI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>86 350 Bar (5000 PSI)</td>
<td></td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>5 drops/min. (.33 cc/min.)</td>
<td></td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>Open 40 ms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Close 40 ms</td>
<td></td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
<td></td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-40°F to +200°F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
<td></td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
<td></td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
<td></td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.14 kg (.31 lbs.)</td>
<td></td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(See BC Section for more details)</td>
<td></td>
</tr>
</tbody>
</table>

Performance Curve
Pressure Drop vs. Flow (Through cartridge only)

Parker Hannifin Corporation
Hydraulic Cartridge Systems

SV43
Bi-Directional Poppet Type, 2-Way Valve  
Series GS02 85/86

**Technical Information**

**Dimensions** Millimeters (Inches)

```
<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>Standard ('SS' Coil)</td>
<td>None</td>
<td></td>
<td></td>
<td>Without Coil</td>
<td>12 VDC</td>
<td>Omit</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>High Pressure ('SP' Coil)</td>
<td>Detented Manual Override (Screw to Operate)</td>
<td></td>
<td></td>
<td>SS</td>
<td>24 VDC</td>
<td>A</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manual Override (Push to Operate)</td>
<td></td>
<td></td>
<td>SP</td>
<td>120 VAC, 60/50 Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LS</td>
<td>240 VAC, 60/50 Hz*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*22 Watts
```

**Ordering Information**

```
<table>
<thead>
<tr>
<th>Code</th>
<th>Screen</th>
<th>Style Normally Open</th>
<th>Override Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Manual Override</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Detented Manual</td>
<td>2</td>
</tr>
</tbody>
</table>
```

See Super Coil 1/2" I.D. Information For Terminal Connectors

---

**Parker Hannifin Corporation**

Hydraulic Cartridge Systems
Bi-Directional Poppet Type, 2-Way Valve
Series GS04 85/86

General Description
2-Way, 2 Position, Normally Open, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Coil is interchangeable with 02 and 06 series poppet valves; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>2 to 1 68 LPM (18 GPM)</td>
</tr>
<tr>
<td></td>
<td>1 to 2 46 LPM (12 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>85 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td></td>
<td>86 350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>See Performance Curves</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile)</td>
</tr>
<tr>
<td></td>
<td>(-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.17 kg (.37 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>2R (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Response Time vs. Flow
Bi-Directional Poppet Type, 2-Way Valve

Series GS04 85/86

Dimensions  Millimeters (Inches)

NOTE: Requires 2R Cavity

Ordering Information

Code Style  Override Options  Screen  Seals  Coil Type  Coil Voltage  Coil Termination

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>Standard (&quot;SS&quot; Coil)</td>
<td>None</td>
<td></td>
<td></td>
<td>Without Coil</td>
<td>12 VDC</td>
<td>Omit</td>
</tr>
<tr>
<td>86</td>
<td>High Pressure (&quot;SP&quot; Coil)</td>
<td>Manual Override</td>
<td></td>
<td></td>
<td>SS</td>
<td>24 VDC</td>
<td>C</td>
</tr>
<tr>
<td>87</td>
<td>Detented Part No. 900690</td>
<td>Detented</td>
<td></td>
<td></td>
<td>SP</td>
<td>120 VAC, 60/50 Hz</td>
<td>D</td>
</tr>
</tbody>
</table>

See Super Coil 1/2" I.D. Information For Terminal Connectors

Order Bodies Separately

Line Body  Porting  Body Material

Code Porting  Body Material

543  1/2" SAE  Aluminum
545  1/2" BSP  Steel
General Description

2-Way, 2 Position, Normally Open, Bi-Directional Poppet Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Built-in thermal relief set at 36 Bar (500 PSI) above rated pressure
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; coil is interchangeable with 02 and 04 series poppet valves; symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>190 LPM (50 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>85 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td></td>
<td>86 350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>5 drops/min. (.33 cc/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>See Performance Curves</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile)</td>
</tr>
<tr>
<td></td>
<td>(-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>0.4 kg (.88 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C16-2 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Response Time vs. Flow
### Bi-Directional Poppet Type, 2-Way Valve

#### Series GS06 85/86

#### Technical Information

**Dimensions**  
Millimeters (Inches)

<table>
<thead>
<tr>
<th>Component</th>
<th>Dimension</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man. Over.</td>
<td>8.6 (0.34)</td>
<td>Manual Override Option (Push to Operate)</td>
</tr>
<tr>
<td>3/4 Hex.</td>
<td>39.6 (1.56)</td>
<td>4.1 Nm (3 lb. ft.) Torque</td>
</tr>
<tr>
<td>1-1/2 Hex.</td>
<td>46.0 (1.80)</td>
<td>108 Nm (80 lb. ft.) Torque</td>
</tr>
<tr>
<td>1-5/16-12 UNF</td>
<td>28.5 (1.12)</td>
<td>Thread</td>
</tr>
<tr>
<td>62.7 (2.47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.8 (0.78)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.8 (1.33)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ordering Information**

<table>
<thead>
<tr>
<th>Code</th>
<th>16 Size</th>
<th>Style</th>
<th>Override</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS06</td>
<td>85</td>
<td>Standard (&quot;SS&quot; Coil)</td>
<td>None</td>
<td>None</td>
<td>N</td>
<td>Nitrile / Buna-N (Std.)</td>
<td>Without Coil</td>
<td>Conduit With Leads</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>86</td>
<td>High Pressure (&quot;SP&quot; Coil)</td>
<td>None</td>
<td>None</td>
<td>V</td>
<td>Fluorocarbon / Buna-N</td>
<td>Without Coil</td>
<td>DIN Plug Face</td>
<td>Aluminum</td>
<td></td>
</tr>
</tbody>
</table>

**Code Coil Voltage**

- **Code**: D012 12 VDC  
- **Code**: D024 24 VDC  
- **Code**: A120 120 VAC, 60/50 Hz  
- **Code**: A240 240 VAC, 60/50 Hz

*22 Watts

**Code Coil Termination**

- **Code**: C | Conduit With Leads
- **Code**: D | DIN Plug Face
- **Code**: A | Amp Jr. Timer*
- **Code**: S | Dual Spade*
- **Code**: L | Dual Lead Wire*
- **Code**: LS | Sealed Lead Wire*
- **Code**: H | Molded Deutsch*

* See Super Coil 1/2” I.D.  
** DC Only

**Code Body Material**

- **Code**: Omit | Steel
- **Code**: A | Aluminum

**Code Port Size Body Part No.**

- **Code**: Omit | Cartridge Only
- **Code**: 16T | SAE-16 (B16-2-16T)
- **Code**: 16B | 1” BSPG (B16-2-16B)

* Add “A” for aluminum, omit for steel.  
| Steel body only.

---

Parker Hannifin Corporation  
Hydraulic Cartridge Systems
Technical Information

Spool Type, 2-Way Valve
Series DSL082

General Description
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane "D"-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>C - 15 LPM (4 GPM) N - 11 LPM (3 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>250 Bar (3600 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32cSt)</td>
<td>120 cc/min. (7.5 in³/min.) at 250 Bar (3600 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized De-Energized</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (&quot;D&quot;-Ring) (-50°F to +200°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.11 kg (.25 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-2 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher Finisher NFT08-2F</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)

Catalog HY15-3502/US
Parker Hannifin Corporation
Hydraulic Cartridge Systems
**Technical Information**

**Spool Type, 2-Way Valve**

**Series DSL082**

### Dimensions

Millimeters (Inches)

- 9.7 (0.38)
- 39.6 (1.56)
- 60.9 (2.40)
- 11.4 (0.45)
- 3/4-16 UNF-2A

**Technical Data**

- **SH**
- **CV**
- **LM**
- **PC**
- **DC**
- **MV**
- **SV**
- **PV**
- **LE**
- **CE**
- **BC**
- **TD**

### Ordering Information

**DSL082**

- **08 Size**
- **Solenoid Valve**
- **Style**
- **Override Option**
- **Seals**
- **Screen**
- **Coil Type**
- **Coil Voltage**
- **Coil Termination**
- **Diode**
- **Body Material**
- **Port Size**

**Code / Style**

- **C** Normal Closed
- **N** Normally Open

**Code / Override Options**

- **Omit**
- **P** Pull & Release
- **T** Push & Twist

**Code / Seals / Kit No.**

- **Omit**
- **D** "D"-Ring / (SK08-2)
- **N** Nitrile / (SK08-2N)
- **V** Fluorocarbon / (SK08-2V)

**Code / Screen**

- **Omit**
- **None**
- **S** Screen

**Code / Coil Type**

- **Omit**
- **Without Coil**
- **Super Coil - 19 Watts**

**Code / Coil Voltage**

- **Omit**
- **D012** 12 VDC
- **D024** 24 VDC
- **A120** 120/110 VAC, 60/50 Hz
- **A240** 240/220 VAC, 60/50 Hz

**Code / Coil Termination**

- **Omit**
- **C** Conduit With Leads
- **D** DIN Plug Face
- **A** Amp Jr. Timer†
- **L** Dual Spade†
- **S** Dual Lead Wire†
- **LS** Sealed Lead Wire†
- **H** Molded Deutsch†

**Code / Port Size / Body Part No.**

- **Omit**
- **4P** 1/4" NPTF (B08-2-*4P)
- **6P** 3/8" NPTF (B08-2-*6P)
- **4T** SAE-4 (B08-2-*4T)
- **6T** SAE-6 (B08-2-*6T)
- **6B** 3/8" BSPG (B08-2-*6B)

*Add "A" for aluminum, omit for steel.
General Description

2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane "D"-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Rated Flow</th>
<th>C ( 15.0 ) LPM (4 GPM)</th>
<th>N ( 8.4 ) LPM (2.8 GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
<td></td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min. (10 in³/min.) at 350 Bar (5000 PSI)</td>
<td></td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized: C ( 40 ) ms, De-Energized: N ( 40 ) ms</td>
<td></td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
<td></td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>(-45°C) to (+93.3°C) (&quot;D&quot;-Ring) (-50°F) to (+200°F) (-31.7°C) to (+121.1°C) (Fluorocarbon) (-25°F) to (+250°F)</td>
<td></td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
<td></td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
<td></td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.11 kg (.25 lbs.)</td>
<td></td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-2 (See BC Section for more details)</td>
<td></td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher: None, Finisher: NFT08-2F</td>
<td></td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)
### Technical Information

**Spool Type, 2-Way Valve**

**Series DSH082**

#### Dimensions

Millimeters (Inches)

![Diagram of Spool Type, 2-Way Valve]

**Ordering Information**

**DSH082**

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Screen</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>08 Size</td>
<td>Solenoid Valve</td>
<td></td>
<td></td>
<td></td>
<td>Omit</td>
<td>D012 12 VDC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Omit</td>
<td>D024 24 VDC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Override Options**

- Omit: None
- T: Push & Twist

**Seals / Kit. No.**

- Omit: "D"-Ring
- N: Nitrile (SK08-2)
- V: Fluorocarbon (SK08-2V)

**Coil Type**

- Omit: Without Coil
- SP*: Super Coil - 19 Watts

**Coil Voltage**

- Omit: Without Coil
- D012: 12 VDC
- D024: 24 VDC

**Coil Termination**

- Omit: Without Coil
- C: Conduit With Leads
- D: DIN Plug Face
- A: Amp Jr. Timer†
- S: Dual Spade†
- L: Dual Lead Wire†
- LS: Sealed Lead Wire†
- H: Molded Deutsch†

**Diode**

- Omit: None
- R: Diode

**Body Material**

- Omit: Steel
- A: Aluminum

**Port Size**

- Omit: Cartridge Only
- 4P: 1/4" NPTF (B08-2-4P)
- 6P: 3/8" NPTF (B08-2-6P)
- 4T: SAE-4 (B08-2-4T)
- 6T: SAE-6 (B08-2-6T)
- 6B: 3/8" BSPG (B08-2-6B)

* Add "A" for aluminum, omit for steel.
General Description

2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane "D"-Ring
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (C)</td>
<td>30 LPM (8.0 GPM)</td>
</tr>
<tr>
<td>Rated Flow (N)</td>
<td>21 LPM (5.5 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>250 Bar (3600 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU</td>
<td>120 cc/min. (7.5 in³/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time (C)</td>
<td>Energized: 30 ms, De-Energized: 20 ms</td>
</tr>
<tr>
<td>Response Time (N)</td>
<td>Energized: 50 ms, De-Energized: 25 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (&quot;D&quot;-Ring) (-50°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.18 kg (.41 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C10-2</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher: None, Finisher: NFT10-2F</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

![Pressure Drop vs. Flow Graph]

Shift Limit Characteristics (Min. Operating Voltage)

![Shift Limit Characteristics Graph]
Spool Type, 2-Way Valve
Series DSL102

**Dimensions** Millimeters (Inches)

- 7-10 Nm (5-7 lb. ft.) Torque
- 50.0 (1.97) mm
- 69.6 (2.74) mm
- 101.4 (3.99) mm
- 43.4 (1.71) mm
- 15.8 (.62) mm

**Ordering Information**

**DSL102**

- 10 Size
- Solenoid Valve

**Code / Style**

- C Normally Closed
- N Normally Open

**Override Option**

- Omit: None
- P Pull & Release
- T Push & Twist

**Seals / Kit No.**

- Omit: “D”-Ring (SK10-2)
- N Nitrile (SK10-2N)
- V Fluorocarbon (SK10-2V)

**Screen**

- Omit: None
- S Screen

**Coil Type**

- Omit: Without Coil
- SP Super Coil - 28 Watts

**Coil Voltage**

- Omit: Without Coil
- D012 12 VDC
- D024 24 VDC
- A120 120/110 VAC, 60/50 Hz
- A240 240/220 VAC, 60/50 Hz

**Coil Termination**

- Omit: Without Coil
- C Conduit With Leads
- D DIN Plug Face
- A Amp Jr. Timer
- S Dual Spade
- L Dual Lead Wire
- LS Sealed Lead Wire
- H Molded Deutsch

**Diode**

- Omit: None
- R Diode

**Body Material**

- Omit: Steel
- A Aluminum

**Port Size**

- 25.7 (1.01) Normal
- 25.9 (1.02) Shutoff
- 31.2 (1.23) Normal
- 32.2 (1.27) Shutoff

**Body Part No.**

- Omit: Cartridge Only
- 4P 1/4” NPTF (B10-2-4P)
- 6P 3/8” NPTF (B10-2-6P)
- 8P 1/2” NPTF (B10-2-8P)
- 6T SAE-6 (B10-2-6T)
- 8T SAE-8 (B10-2-8T)
- T8T SAE-8 (B10-2-T8T)
- 6B 3/8” BSPG (B10-2-6B)

*Add “A” for aluminum. Omit for steel.
†Steel body only.
**General Description**

2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

**Features**

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane "D"-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

**Specifications**

<table>
<thead>
<tr>
<th>Rated Flow</th>
<th>C - 30 LPM (8.0 GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N - 19 LPM (5.0 GPM)</td>
<td></td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min. (10 in³/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized 30 ms De-Energized 20 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (&quot;D&quot;-Ring)</td>
</tr>
<tr>
<td></td>
<td>-50°F to +200°F</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>-25°F to +250°F</td>
</tr>
<tr>
<td>Fluid Compatibility/ Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.18 kg (.40 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C10-2 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher Finisher NFT10-2F</td>
</tr>
</tbody>
</table>

**Performance Curves**

**Pressure Drop vs. Flow (Through cartridge only)**

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPM</td>
<td>0</td>
<td>23</td>
<td>46</td>
<td>69</td>
<td>92</td>
</tr>
<tr>
<td>PSI</td>
<td>0</td>
<td>25</td>
<td>50</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>Bar</td>
<td>0</td>
<td>17</td>
<td>34</td>
<td>51</td>
<td>68</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fluid Oil 150 SSU @ 100°F (32 cSt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Pressure - PSI</td>
</tr>
<tr>
<td>3000</td>
</tr>
<tr>
<td>4000</td>
</tr>
<tr>
<td>5000</td>
</tr>
</tbody>
</table>

**Shift Limit Characteristics** (Min. Operating Voltage)

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPM</td>
<td>0</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>PSI</td>
<td>0</td>
<td>276</td>
<td>552</td>
<td>828</td>
<td>1104</td>
</tr>
<tr>
<td>Bar</td>
<td>0</td>
<td>19.2</td>
<td>38.5</td>
<td>57.8</td>
<td>77.1</td>
</tr>
</tbody>
</table>

---

Parker Hannifin Corporation
Hydraulic Cartridge Systems
Dimensions  Millimeters (Inches)

[Diagram with dimensions and measurements]

Ordering Information

**DSH102**

<table>
<thead>
<tr>
<th>10 Size Solenoid Valve</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Screen</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
</table>

**Code / Style**

- C: Normally Closed
- N: Normally Open

**Override Options**

- Omit: None
- T: Push & Twist (N.C. & N.O.)

**Seals / Kit No.**

- D*: "D"-Ring (SK10-2)
- N: Nitrile (SK10-2N)
- V: Fluorocarbon (SK10-2V)

**Coil Type**

- C: Conduit With Leads
- D: DIN Plug Face
- A: Amp Jr. Timer
- S: Dual Spade
- L: Dual Lead Wire
- LS: Sealed Lead Wire
- H: Molded Deutsch

**Coil Voltage**

- D012: 12 VDC
- D024: 24 VDC
- A120: 120/110 VAC, 60/50 Hz
- A240: 240/220 VAC, 60/50 Hz

**Coil Termination**

- Without Coil
- C: Conduit With Leads
- D: DIN Plug Face
- A: Amp Jr. Timer
- S: Dual Spade
- L: Dual Lead Wire
- LS: Sealed Lead Wire
- H: Molded Deutsch

**Port Size**

- 4P: 1/4" NPTF (B10-2-4P)
- 6P: 3/8" NPTF (B10-2-6P)
- 8P: 1/2" NPTF (B10-2-8P)
- 6T: SAE-6 (B10-2-6T)
- 8T: SAE-8 (B10-2-8T)
- TBT: SAE-8 (B10-2-TBT)
- 6B: 3/8" BSPG (B10-2-6B)

**Body Material**

- Omit: None
- R: Diode
- A: Aluminum

**Body Part No.**

- Cartridge Only

*Recommended for DC Only*
General Description
2-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- Low hysteresis
- One-piece encapsulated coil with minimal amperage draw
- Variety of coil terminations and voltages
- Manual override standard (push and release)
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>75 LPM (20 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>240 cc/min. (15 in³/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>C - 90 ms</td>
</tr>
<tr>
<td></td>
<td>N - 100 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile)</td>
</tr>
<tr>
<td></td>
<td>(-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.59 kg (1.3 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C16-2</td>
</tr>
<tr>
<td></td>
<td>(See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher Finisher None NFT16-2F</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Normally Closed

![Normally Closed Pressure Drop Graph]

![Graph showing pressure drop vs. flow for Normally Closed configuration]

Normally Open

![Normally Open Pressure Drop Graph]

![Graph showing pressure drop vs. flow for Normally Open configuration]
Catalog HY15-3502/US
Parker Hannifin Corporation
Hydraulic Cartridge Systems

Check Valves
Shuttle Valves
Load/Motor Controls
Flow Controls
Pressure Controls
Logic Elements
Directional Controls
Manual Valves
Proportional Valves
Coils & Electronics

Technical Data

Dimensions  Millimeters (Inches)

Ordering Information

DS162  16 Size Solenoid Valve

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Seals</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>Not Available</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td>Not Available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Code / Style
- C: Normally Closed
- N: Normally Open

Code / Style
- C: Normally Closed
- V: Normally Open

Seals / Kit No.
- Omit: Nitrile / (SK16-2)
- Omit: Fluorocarbon / (SK16-2V)

Coil Voltage
- 12 VDC
- 24 VDC
- 120/110 VAC, 60/50 Hz

Coil Termination
- Omit: Without Coil
- C: DIN Plug Face
- D: Dual Spade (DC Only)
- P: Dual Screw (DC Only)
- S: Dual Lead (DC Only)

Body Material
- Omit: Steel
- A: Aluminum

Port Size
- Omit: Cartridge Only
- 12T: SAE-12 (B16-2-12T)
- 16T: SAE-16 (B16-2-16T)
- 12B: 3/4" BSPG (B16-2-12B)
- 16B: 1" BSPG (B16-2-16B)

* Add “A” for aluminum, omit for steel.
† Steel body only.

Parker Hannifin Corporation
Hydraulic Cartridge Systems
General Description

3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One piece encapsulated coils with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Rated Flow</th>
<th>DSL083A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.O.</td>
<td>13.2 LPM (3.5 GPM)</td>
</tr>
<tr>
<td>N.C.</td>
<td>8.4 LPM (2.25 GPM)</td>
</tr>
<tr>
<td>Selector DSL083B</td>
<td>8.4 LPM (2.25 GPM)</td>
</tr>
<tr>
<td>N.O.</td>
<td>15.0 LPM (4.0 GPM)</td>
</tr>
<tr>
<td>N.C.</td>
<td>15.0 LPM (4.0 GPM)</td>
</tr>
<tr>
<td>DSL083C</td>
<td>15.0 LPM (4.0 GPM)</td>
</tr>
<tr>
<td>N.O.</td>
<td>15.0 LPM (4.0 GPM)</td>
</tr>
<tr>
<td>DSL083N</td>
<td>12.3 LPM (3.25 GPM)</td>
</tr>
<tr>
<td>N.O.</td>
<td>15.0 LPM (4.0 GPM)</td>
</tr>
</tbody>
</table>

Maximum Inlet Pressure 250 Bar (3600 PSI)

Leakage at 150 SSU (32 cSt) 120 cc/min. (7.5 in³/min.)

Minimum Operating Voltage 85% of rated voltage at 20°C (72°F).

Response Time 50 ms

Cartridge Material All parts steel. All operating parts hardened steel.

Operating Temp. Range/Seals -45°C to +93.3°C (“D”-Ring)
(-50°F to +200°F)
-31.7°C to +121.1°C (Fluorocarbon)
(-25°F to +250°F)

Fluid Compatibility/Viscosity Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)

Filtration ISO Code 16/13, SAE Class 4 or better

Approx. Weight .13 kg (.28 lbs.)

Cavity C08-3
(See BC Section for more details)

Form Tool Rougher NFT08-3R
Finisher NFT08-3F

Construction/Symbols

DSL083A

DSL083B

DSL083C

DSL083N
## Technical Information

### Dimensions

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>Omit</td>
<td>None</td>
<td>SP</td>
<td>Without Coil</td>
<td>With Leads</td>
<td>None</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>P</td>
<td>Pull &amp; Release</td>
<td>C</td>
<td>12 VDC</td>
<td>7/8&quot; Hex</td>
<td>None</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>T</td>
<td>Push &amp; Twist</td>
<td>D</td>
<td>24 VDC</td>
<td>3/8&quot; Hex</td>
<td>None</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>None</td>
<td>Aluminum</td>
<td></td>
</tr>
</tbody>
</table>

### Ordering Information

- **Code A**: Without Coil - 19 Watts
- **Code B**: Pull & Release
- **Code C**: Push & Twist
- **Code N**: Super Coil - 19 Watts

*Recommended for DC Only*
### Performance Curves

**Spool Type, 3-Way Valve**

**Series DSL083**

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Flow</th>
<th>Pressure Drop vs. Flow (Through cartridge only)</th>
<th>Shift Limit Characteristics (Min. Operating Voltage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSL083A</td>
<td>1, 2, 3, 4 LPM</td>
<td><img src="image1" alt="Graph" /></td>
<td><img src="image2" alt="Graph" /></td>
</tr>
<tr>
<td>DSL083B</td>
<td>1, 2, 3, 4 LPM</td>
<td><img src="image3" alt="Graph" /></td>
<td><img src="image4" alt="Graph" /></td>
</tr>
<tr>
<td>DSL083C</td>
<td>1, 2, 3, 4 LPM</td>
<td><img src="image5" alt="Graph" /></td>
<td><img src="image6" alt="Graph" /></td>
</tr>
<tr>
<td>DSL083N</td>
<td>1, 2, 3, 4 LPM</td>
<td><img src="image7" alt="Graph" /></td>
<td><img src="image8" alt="Graph" /></td>
</tr>
</tbody>
</table>

**Technical Data**

- Fluid: Hydraulic Oil 150 SSU @ 100°F (32 cSt)
- Operating Pressure: 0 to 1000 PSI, 2000 PSI (276 PSI Bar)
- Shift Limit Characteristics (Min. Operating Voltage):
  - DSL083A: 1 to 2, 2 to 1
  - DSL083B: 3 to 2, 2 to 1
  - DSL083C: 1 to 3, 2 to 1
  - DSL083N: 3 to 2, 1 to 2

General Description
3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One piece encapsulated coils with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications
<table>
<thead>
<tr>
<th>Rated Flow</th>
<th>DSH083A</th>
<th>DSH083B</th>
<th>DSH083C</th>
<th>DSH083N</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.O.</td>
<td>11.3 LPM (3.0 GPM)</td>
<td>15.0 LPM (4.0 GPM)</td>
<td>15.0 LPM (4.0 GPM)</td>
<td>11.3 LPM (3.0 GPM)</td>
</tr>
<tr>
<td>N.C.</td>
<td>7.5 LPM (2.0 GPM)</td>
<td>7.5 LPM (2.0 GPM)</td>
<td>15.0 LPM (4.0 GPM)</td>
<td>15.0 LPM (4.0 GPM)</td>
</tr>
<tr>
<td>Selector</td>
<td>7.5 LPM (2.0 GPM)</td>
<td>15.0 LPM (4.0 GPM)</td>
<td>15.0 LPM (4.0 GPM)</td>
<td>15.0 LPM (4.0 GPM)</td>
</tr>
</tbody>
</table>

- Maximum Inlet Pressure: 350 Bar (5000 PSI)
- Leakage at 150 SSU (32 cSt): 160 cc/min. (10 in³/min.) at 350 Bar (5000 PSI)
  - DSH083B: 250 cc/min. (15 in³/min.)
  - DSH083N: 250 cc/min. (15 in³/min.)
- Minimum Operating Voltage: 85% of rated voltage at 20°C (72°F)
- Response Time: 50 ms
- Cartridge Material: All parts steel. All operating parts hardened steel.
- Operating Temp. Range/Seals: -45°C to +93.3°C (D⁰-Ring)
  - (-50°F to +200°F)
  - 31.7°C to +121.1°C (Fluorocarbon)
  - (-25°F to +250°F)
- Fluid Compatibility/Viscosity: Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
- Filtration: ISO Code 16/13, SAE Class 4 or better
- Approx. Weight: .13 kg (.28 lbs.)
- Cavity: C08-3 (See BC Section for more details)
- Form Tool: Rougher NFT08-3R, Finisher NFT08-3F
Spool Type, 3-Way Valve
Series DSH083

Dimensions  Millimeters (Inches)

See Super Coil
1/2" I.D.
Information For
Terminal Connectors

7/8" Hex.
43-49 Nm (32-36 lb ft.)
Torque

3/4-16 UNF-2A
Thread

Ordering Information

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals / Kit No.</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Terminal</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>None</td>
<td>D&quot;-Ring / (SK08-3)</td>
<td>Without Coil</td>
<td>Without Coil</td>
<td></td>
<td>None</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>Push &amp; Twist*</td>
<td>Nitrile / (SK08-3N)</td>
<td>SP* Super Coil - 19 Watts</td>
<td>D012 12 VDC</td>
<td></td>
<td>None</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>Fluorocarbon / (SK08-3V)</td>
<td></td>
<td>D024 24 VDC</td>
<td></td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A120 120/110 VAC, 60/50 Hz</td>
<td></td>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Recommended

*Requires Super Coil

*Recommended

†DC Only

*Add "A" for aluminum, omit for steel.
Spool Type, 3-Way Valve
Series DSH083

**Performance Curves**

**Pressure Drop vs. Flow (Through cartridge only)**

- **DSH083A**
- **DSH083B**
- **DSH083C**
- **DSH083N**

**Shift Limit Characteristics (Min. Operating Voltage)**

- **DSH083A**
- **DSH083B**
- **DSH083C**
- **DSH083N**

Hydraulic Oil 150 SSU @ 100°F (32 cSt)
Technical Information

Spool Type, 3-Way Valve
Series DSL103

General Description
3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Rated Flow</th>
<th>DSL103A</th>
<th>DSL103B</th>
<th>DSL103C</th>
<th>DSL103N</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.O.</td>
<td>22.7 LPM (6.0 GPM)</td>
<td>30.2 LPM (8.0 GPM)</td>
<td>30.2 LPM (8.0 GPM)</td>
<td>18.8 LPM (5.0 GPM)</td>
</tr>
<tr>
<td>N.C.</td>
<td>17.0 LPM (4.5 GPM)</td>
<td>18.8 LPM (5.0 GPM)</td>
<td>18.8 LPM (5.0 GPM)</td>
<td>18.8 LPM (5.0 GPM)</td>
</tr>
<tr>
<td></td>
<td>N.C.</td>
<td>30.2 LPM (8.0 GPM)</td>
<td>30.2 LPM (8.0 GPM)</td>
<td>30.2 LPM (8.0 GPM)</td>
</tr>
<tr>
<td></td>
<td>N.O.</td>
<td>18.8 LPM (5.0 GPM)</td>
<td>18.8 LPM (5.0 GPM)</td>
<td>18.8 LPM (5.0 GPM)</td>
</tr>
<tr>
<td></td>
<td>Selector</td>
<td>17.0 LPM (4.5 GPM)</td>
<td>17.0 LPM (4.5 GPM)</td>
<td>17.0 LPM (4.5 GPM)</td>
</tr>
</tbody>
</table>

- Maximum Inlet Pressure: 250 Bar (3600 PSI)
- Leakage at 150 SSU (32 cSt): 120 cc/min. (7.5 in³/min.)
  - DSL103B - 180 cc/min. (11 in³/min.)
  - DSL103N - 180 cc/min. (11 in³/min.)
- Minimum Operating Voltage: 85% of rated voltage at 20°C (72°F).
- Response Time: 50 ms to 100 ms
- Cartridge Material: All parts steel. All operating parts hardened steel.
- Operating Temp. Range/Seals: -45°C to +93.3°C (“D”-Ring)
  - (-50°F to +200°F)
  - -31.7°C to +121.1°C (Fluorocarbon)
  - (-25°F to +250°F)
- Fluid Compatibility/Viscosity: Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
- Filtration: ISO Code 16/13, SAE Class 4 or better
- Approx. Weight: .19 kg (.42 lbs.)
- Cavity: C10-3 (See BC Section for more details)
- Form Tool: Rougher NFT10-3R, Finisher NFT10-3F

Construction/Symbols
Spool Type, 3-Way Valve
Series DSL103

Dimensions  Millimeters (Inches)

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>Omit None</td>
<td></td>
<td></td>
<td>Omit Without Coil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>P Pull &amp; Release</td>
<td></td>
<td>SP*</td>
<td>D012 12 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>T Push &amp; Twist</td>
<td></td>
<td></td>
<td>D024 24 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A120 120/110 VAC, 60/50 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A240 240/220 VAC, 60/50 Hz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ordering Information

See Super Coil 5/8" I.D. Information For Terminal Connectors

1" Hex, 50-56 Nm (37-41 lb. ft.) Torque
7/8-14 UNF-2A Thread

A      Without Coil      Omit None  -  Cartridge Only  4P  1/4" NPTF  (B10-3-4P)
B      Without Coil      Omit Without Coil  -  (B10-3-6P)
C      C Conduit With Leads  SP*  1/2" NPTF  (B10-3-8P)
D      DIN Plug Face      Coil  SAE-6  (B10-3-6T)
A      Amp Jr. Timer†  D Spade†  SAE-8  (B10-3-8T)
S      Dual Spade†  L Dual Lead Wire†  6B  3/8" BSPG  (B10-3-6B)
L      Sealed Lead Wire†  Timer†  8B  1/2" BSPG  (B10-3-8B)
H      Molded Deutsch†      -  "A" for aluminum, omit for steel.  Steel bodies only.  |

* Recommended
† DC Only
Spool Type, 3-Way Valve
Series DSL103

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

- DSL103A
- DSL103B
- DSL103C
- DSL103N

Shift Limit Characteristics (Min. Operating Voltage)

- DSL103A
- DSL103B
- DSL103C
- DSL103N
General Description

3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Rated Flow</th>
<th>DSH103A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.O.</td>
<td>17.0 LPM (4.5 GPM)</td>
</tr>
<tr>
<td>N.C.</td>
<td>15.0 LPM (4.0 GPM)</td>
</tr>
<tr>
<td>Selector</td>
<td>15.0 LPM (4.0 GPM)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DSH103B</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.C.</td>
</tr>
<tr>
<td>Selector</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DSH103C</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.O.</td>
</tr>
<tr>
<td>N.C.</td>
</tr>
<tr>
<td>Selector</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DSH103N</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.O.</td>
</tr>
<tr>
<td>N.C.</td>
</tr>
<tr>
<td>Selector</td>
</tr>
</tbody>
</table>

Maximum Inlet Pressure
- 350 Bar (5000 PSI)

Leakage at 150 SSU (32 cSt)
- 160 cc/min. (10 in³/min.)
- DSH103B - 250 cc/min. (15 in³/min.)
- DSH103N - 250 cc/min. (15 in³/min.)

Minimum Operating Voltage
- 85% of rated voltage at 20°C (72°F).

Response Time
- 50 ms to 100 ms

Cartridge Material
- All parts steel. All operating parts hardened steel.

Operating Temp. Range/Seals
- -45°C to +93.3°C (“D”-Ring)
- (-50°F to +200°F)
- -31.7°C to +121.1°C (Fluorocarbon)
- (-25°F to +250°F)

Fluid Compatibility/Viscosity
- Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)

Filtration
- ISO Code 16/13,
- SAE Class 4 or better

Approx. Weight
- .19 kg (.42 lbs.)

Cavity
- C10-3
  (See BC Section for more details)

Form Tool
- Rougher NFT10-3R
- Finisher NFT10-3F
### Spool Type, 3-Way Valve
**Series DSH103**

#### Dimensions

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals / Kit No.</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Recommended* for coil type.

#### Ordering Information

**DSH103**

10 Size Solenoid Valve

- **Code**: A, B, C, N
- **Style**: 
  - (1) (2)
- **Override Options**: None, Push & Twist (N.C. & N.O.)
- **Seals / Kit No.**: D-Ring / (SK10-3), Nitrile / (SK10-3N), Fluorocarbon / (SK10-3V)
- **Coil Type**: Without Coil, SP* - Super Coil - 28 Watts
- **Diode Voltage**:
  - Without Coil
  - D012 12 VDC
  - D024 24 VDC
  - A120 120/110 VAC, 60/50 Hz
  - A240 240/220 VAC, 60/50 Hz
- **Coil Termination**:
  - Without Coil
  - C Conduit With Leads
  - D DIN Plug Face
  - A Amp Jr. Timer†
  - S Dual Spade†
  - L Dual Lead Wire†
  - LS Sealed Lead Wire†
  - H Molded Deutsch†
- **Body Material**:
  - Steel
  - Aluminum
- **Port Size**:
  - Cartridge Only
  - 1/4” NPTF (B10-3-*4P)
  - 3/8” NPTF (B10-3-*6P)
  - 1/2” NPTF (B10-3-*8P)
  - SAE-6 (B10-3-*6T)
  - SAE-8 (B10-3-*8T)
  - 3/8” BSPG (B10-3-6B)†
  - 1/2” BSPG (B10-3-*8B)†

*Add “A” for aluminum, omit for steel.†Steel bodies only.
SPOOL TYPE, 3-WAY VALVE

Series DSH103

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

<table>
<thead>
<tr>
<th>Model</th>
<th>Flow (Q)</th>
<th>Pressure Drop (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSH103A</td>
<td>0, 2, 3, 4, 6, 8 LPM</td>
<td>0, 5, 7, 10, 12 PSI</td>
</tr>
</tbody>
</table>

Shift Limit Characteristics (Min. Operating Voltage)

<table>
<thead>
<tr>
<th>Model</th>
<th>Operating Pressure - PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSH103A</td>
<td>0, 1000, 2000, 6000, 1414</td>
</tr>
</tbody>
</table>

Hydraulic Oil 150 SSU @ 100°F (32 cSt)

Technical Data

SH, CV, LM, FC, PC, LE, DC, MV, SV, PV, CE, BC, TD

Parker Hannifin Corporation
Hydraulic Cartridge Systems

SV70
General Description
3-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- No dynamic seals
- Variety of coil terminations
- All external parts zinc plated
- Manual override standard

Specifications

<table>
<thead>
<tr>
<th>Rated Flow</th>
<th>DS163</th>
<th>DS163B</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.O.</td>
<td>45.4 LPM (12 GPM)</td>
<td>26.5 LPM (7 GPM)</td>
</tr>
<tr>
<td>N.C.</td>
<td>49.2 LPM (13 GPM)</td>
<td>53.0 LPM (14 GPM)</td>
</tr>
<tr>
<td>Selector</td>
<td>41.6 LPM (11 GPM)</td>
<td>56.8 LPM (15 GPM)</td>
</tr>
</tbody>
</table>

Maximum Inlet Pressure 210 Bar (3000 PSI)

Leakage at 150 SSU (32 cSt) 82 cc/min. (5 in³/min.)

Minimum Operating Voltage 85% of rated voltage at 20°C (72°F).

Response Time Normally Closed up to 90 ms
Normally Open up to 100 ms

Cartridge Material All parts steel. All operating parts hardened steel.

Operating Temp. Range/Seals -40°C to +93.3°C (Nitrile)
-40°F to +200°F
-31.7°C to +121.1°C (Fluorocarbon)
-25°F to +250°F

Fluid Compatibility/ Viscosity Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)

Filtration ISO Code 16/13,
SAE Class 4 or better

Approx. Weight .59 kg (1.3 lbs.)

Cavity C16-3
(See BC Section for more details)

Form Tool Rougher NFT16-3R
Finisher NFT16-3F
### Performance Drop Curves

**Pressure Drop vs. Flow (Through cartridge only)**

![Graph showing pressure drop vs. flow for DS163 and DS163B valves.]

**Shift Limit Characteristics (Min. Operating Voltage)**

![Graph showing shift limit characteristics for DS163 and DS163B valves.]

### Ordering Information

**DS163**

- **16 Size Solenoid Valve**
- **Style**
- **Seals**
- **Coil Voltage**
- **Coil Termination**
- **Body Material**
- **Port Size**

**Code**

- **Style**
- **Seals / Kit No.**
- **Body Material**
- **Port Size**

**Code Coil Termination**

- **Without Coil**
- **C** Conduit (AC Only)
- **D** DIN Plug Face
- **S** Dual Screw (DC Only)
- **W** Dual Lead (DC Only)

**Code**

- **M1** Nitrile / (SK16-3)
- **M2** Fluorocarbon / (SK16-3V)

**Code**

- **V**

**Code**

- **B**

**Code**

- **D012** 12 VDC
- **D024** 24 VDC
- **A120** 120/110 VAC, 60/50 Hz

**Code**

- **A**

**Code**

- **N.C.**
- **N.O.**

**Code**

- **A** for aluminum, omit for steel.
General Description

4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Rated Flow</th>
<th>11-15 LPM (3-4 GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Inlet Pressure</td>
<td>250 Bar (3600 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU</td>
<td>160 cc/min. (10 in³/min.) at 250 Bar (3600 PSI)</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized - 50 ms De-energized - 30 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.13 kg (.29 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-4 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher NFT08-4R Finisher NFT08-4F</td>
</tr>
</tbody>
</table>

Curves Selection Chart

<table>
<thead>
<tr>
<th>HOLE CODE</th>
<th>NEUTRAL</th>
<th>SHIFTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>E1</td>
<td>——</td>
<td>——</td>
</tr>
<tr>
<td>M</td>
<td>——</td>
<td>3</td>
</tr>
<tr>
<td>N</td>
<td>——</td>
<td>——</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)
Catalog HY15-3502/US

Parker Hannifin Corporation

Hydraulic Cartridge Systems

Check Valves
Shuttle Valves
Load/Motor Controls
Flow Controls
Pressure Controls
Logic Elements
Directional Controls
Manual Valves
Proportional Valves
Coils & Electronics

Technical Data

SH
CV

Solenoid Valves

Spool Type, 4-Way Valve
Series DSL084

Dimensions Millimeters (Inches)

Ordering Information

DSL084

08 Size Solenoid Valve

Style
Override Option
Seals
Coil Type
Coil Voltage
Coil Termination
Diode
Body Material
Port Size

Code Style

B (2) (4)

(3) (1)

N (2) (4)

(3) (1)

E1 (2) (4)

(3) (1)

M (2) (4)

(3) (1)

Code Override Options

Omit None
P Pull & Release
T Push & Twist

Code Seals / Kit No.

Omit "D"-Ring / (SK08-4)
N Nitrile / (SK08-4N)
V Fluorocarbon / (SK08-4V)

Code Coil Type

Omit Without Coil
SP* Super Coil - 19 Watts

Code Coil Voltage

Omit Without Coil
D012 12 VDC
D024 24 VDC
A120 120/110 VAC, 60/50 Hz
A240 240/220 VAC, 60/50 Hz

Code Coil Termination

Omit Without Coil
C Conduit With Leads
D DIN Plug Face
A Amp Jr. Timer†
S Dual Spade†
L Dual Lead Wire†
LS Sealed Lead Wire†
H Molded Deutsch†

Code Diode

Omit None
R Diode

Code Body Material

Omit Steel
A Aluminum

Code Port Size Body Part No.

Omit Cartridge Only
4T SAE-4 (B08-4-*4T)
6T SAE-6 (B08-4-*6T)
6B 3/8" BSPG (B08-4-*6B)

* Add "A" for aluminum, omit for steel.

*Recommended

†DC Only
General Description

4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>11-15 LPM (3-4 GPM)</td>
</tr>
<tr>
<td>Max. Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min. (10 in³/min.)</td>
</tr>
<tr>
<td></td>
<td>at 350 Bar (5000 PSI)</td>
</tr>
<tr>
<td></td>
<td>DSH084B - 240 cc/min. (15 in³/min.)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized - 50 ms</td>
</tr>
<tr>
<td></td>
<td>De-energized - 30 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (“D”-Ring)</td>
</tr>
<tr>
<td></td>
<td>(-50°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon)</td>
</tr>
<tr>
<td></td>
<td>(-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.13 kg (.29 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-4 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher NFT08-4R</td>
</tr>
<tr>
<td></td>
<td>Finisher NFT08-4F</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)

Curve Selection Chart

<table>
<thead>
<tr>
<th>SPool CODE</th>
<th>NEUTRAL</th>
<th>SHIFTED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 to 1</td>
<td>3 to 2</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>E1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>M</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>N</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
**Technical Information**

**Spool Type, 4-Way Valve**

**Series DSH084**

### Dimensions

<table>
<thead>
<tr>
<th>Millimeters (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.7 (.38)</td>
</tr>
<tr>
<td>39.6 (1.56)</td>
</tr>
<tr>
<td>60.9 (2.40)</td>
</tr>
<tr>
<td>113.8 (4.48)</td>
</tr>
<tr>
<td>11.4 (.45)</td>
</tr>
<tr>
<td>7-10Nm (5-7 lb. ft.) Torque</td>
</tr>
<tr>
<td>7/8&quot; Hex. 43-49 Nm (32-36 lb. ft.) Torque</td>
</tr>
<tr>
<td>3/4-16 UNF-2A Thread</td>
</tr>
<tr>
<td>Ø 12.6 (.50)</td>
</tr>
</tbody>
</table>

### Ordering Information

<table>
<thead>
<tr>
<th>DSH084</th>
<th>08 Size Solenoid Valve</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>(2) (4)</td>
<td></td>
<td></td>
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<tr>
<td>N</td>
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<td>(2) (4)</td>
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</tr>
<tr>
<td>E1</td>
<td></td>
<td>(2) (4)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>(2) (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Code Override Options**

- **Omit**: None
- **T**: Push & Twist*

*Requires Super Coil

**Code Seals / Kit No.**

- **Omit**: D"-Ring / (SK08-4)
- **N**: Nitrile / (SK08-4N)
- **V**: Fluorocarbon / (SK08-4V)

**Code Coil Type**

- **Omit**: Without Coil
- **SP**: Super Coil - 19 Watts

*Recommended

**Code Coil Voltage**

- **Omit**: Without Coil
  - D012: 12 VDC
  - D024: 24 VDC
- **A120**: 120/110 VAC, 60/50 Hz
- **A240**: 240/220 VAC, 60/50 Hz

**SP* Coil**

- **Omit**: Without Coil
  - C: Conduit With Leads
  - D: DIN Plug Face
  - A: Amp Jr. Timer†
  - S: Dual Spade†
  - L: Dual Lead Wire†
  - LS: Sealed Lead Wire†
  - H: Molded Deutsch†

*Recommended†DC Only

**Code Coil Termination**

- **Omit**: Without Coil
- **C**: Conduit With Leads
- **D**: DIN Plug Face
- **A**: Amp Jr. Timer†
- **S**: Dual Spade†
- **L**: Dual Lead Wire†
- **LS**: Sealed Lead Wire†
- **H**: Molded Deutsch†

*Recommended†DC Only

**Code Diode**

- **Omit**: None
- **R**: Diode

**Code Body Material**

- **Omit**: Steel
- **A**: Aluminum

**Code Port Size Body Part No.**

- **Omit**: Cartridge Only
- **4T**: SAE-4 (B08-4-4T)
- **6T**: SAE-6 (B08-4-6T)
- **8B**: 3/8" BSPG (B08-4-8B)

* Add "A" for aluminum, omit for steel.
General Description
4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane “D”- Ring
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>27-38 LPM (7-10 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>250 Bar (3600 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>230 cc/min (14 in³/min)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized - 30 - 60 ms De-energized - 30 - 60 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (“D”-Ring) (-50°F to +200°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.20 kg (.44 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C10-4 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher Finisher NFT10-4R Finisher NFT10-4F</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>Pressure Drop (l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
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<tr>
<td>4</td>
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<td>8</td>
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<tr>
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<tr>
<td>28</td>
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<td>32</td>
<td>32</td>
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Shift Limit Characteristics (Min. Operating Voltage)

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>Operating Pressure (PSI)</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<td>2</td>
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<td>30</td>
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</tr>
<tr>
<td>32</td>
<td>32</td>
</tr>
</tbody>
</table>

Parker Hannifin Corporation
Hydraulic Cartridge Systems
Spool Type, 4-Way Valve

Series DSL104

Dimensions  Millimeters (Inches)

Ordering Information

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
<td>Omit None</td>
<td></td>
<td></td>
<td>Omit Without Coil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td></td>
<td>P Pull &amp; Release</td>
<td></td>
<td></td>
<td>D012 12 VDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1</td>
<td></td>
<td>T Push &amp; Twist</td>
<td></td>
<td></td>
<td>D024 24 VDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A120 120/110 VAC, 60/50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A240 240/220 VAC, 60/50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
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</tbody>
</table>

*Recommended

SP* Coil

<table>
<thead>
<tr>
<th>Code</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Without Coil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Conduit With Leads</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Amp Jr. Timer†</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Dual Spade†</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Dual Lead Wire†</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LS</td>
<td>Sealed Lead Wire†</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Molded Deutsch†</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Recommended

** Recommended

† Add "A" for aluminum, omit for steel.  Steel bodies only

Technical Data

Shut-off Valves

Load/Motor Controls

Flow Controls

Pressure Controls

Logic Elements

Directional Controls

Manual Valves

Proportional Valves

Coils & Electronics

Technical Data

Parker Hannifin Corporation
Hydraulic Cartridge Systems
Technical Information

Spool Type, 4-Way Valve
Series DSH104

General Description

4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Manual overrides, seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Polyurethane "D"-Ring eliminates need for backup rings
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>25 - 38 LPM (6.5 - 10 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min (10 in³/min) DSH104B - 320 cc/min (19.5 in³/min)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized - 30 - 60 ms De-energized - 30 - 60 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (&quot;D&quot;-Ring) (-50°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.20 kg (.44 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C10-4 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher Finisher NFT10-4R Finisher NFT10-4F</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)
Spool Type, 4-Way Valve
Series DSH104

Dimensions  Millimeters (Inches)

Ordering Information

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
<td>Omit None</td>
<td></td>
<td></td>
<td>D012 12 VDC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td></td>
<td>T Push &amp; Twist</td>
<td></td>
<td></td>
<td>D024 24 VDC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1</td>
<td></td>
<td>Omit D&quot;-Ring / (SK10-4)</td>
<td>N Nitrile / (SK10-4N)</td>
<td>V Fluorocarbon / (SK10-4V)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E4</td>
<td></td>
<td>Omit None</td>
<td></td>
<td></td>
<td>A120 120/110 VAC, 60/50 Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E15</td>
<td></td>
<td>SP* Super Coil - 28 Watts</td>
<td></td>
<td></td>
<td>A240 240/220 VAC, 60/50 Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Recommended

Code Coil Type

- C Conduit With Leads
- D DIN Plug Face
- A Amp Jr. Timer†
- S Dual Spade†
- L Dual Lead Wire†
- LS Sealed Lead Wire†
- H Molded Deutsch†

*Recommended

Code Coil Termination

- Without Coil
- C Conduit With Leads
- D DIN Plug Face
- A Amp Jr. Timer†
- S Dual Spade†
- L Dual Lead Wire†
- LS Sealed Lead Wire†
- H Molded Deutsch†

*Recommended

Code Port Size Body Part No.

- 6P 3/8" NTPF (B10-4-*6P)
- 6T SAE-6 (B10-4-*6T)
- 8T SAE-8 (B10-4-*8T)
- 6B 3/8" BSPG (B10-4-6B)†

* Add "A" for aluminum, omit for steel. † Steel bodies only
Spool Type, 4-Way Valve
Series DSH164

General Description
4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features
- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- One-piece encapsulated coil with minimal amperage draw
- Seal variations and other options available
- No dynamic seals
- Variety of coil terminations
- Nylon inserted jam-nut provides secure holding in high vibration applications
- All external parts zinc plated

Application Note
This valve is a pilot operated spool type valve. It does not require a separate pilot supply, but does require that the work port pressure or the inlet pressure is 40-60 psi higher than port 1. In an open flowing condition, with zero load and low flow, it will require a 4-6 gpm flow to create internal pilot pressure to shift. If load pressure or system pressure is 40-60 psi higher than tank, the valve will shift. Ultimately, the valve shifts based upon pressure differential from port 3 to port 1 of 40-60 psi.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>114 LPM (30 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>350 cc/min (21 in³/min) De-Energ. 5.6 LPM (1.5 GPM) Energized Pilot Flow @ 207 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time</td>
<td>Pull In - 600 ms  Drop Out - 130 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.59 kg (1.3 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C16-4 (See BC Section for more details)</td>
</tr>
<tr>
<td>Form Tool</td>
<td>Rougher NFT16-4R  Finisher NFT16-4F</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>Pressure Drop (µ)</th>
</tr>
</thead>
<tbody>
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<td>0</td>
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<tr>
<td>5</td>
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<td>15</td>
<td>94</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>30</td>
<td>94</td>
</tr>
</tbody>
</table>

Hydraulic Oil 150 SSU @ 100°F (32 cSt)

Pressure Drop vs. Flow (Through cartridge only)

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>Pressure Drop (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>94</td>
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<tr>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>15</td>
<td>94</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>30</td>
<td>94</td>
</tr>
</tbody>
</table>

Hydraulic Oil 150 SSU @ 100°F (32 cSt)
Spool Type, 4-Way Valve
Series DSH164

Dimensions  Millimeters (Inches)

Ordering Information

Code  Style  Seals  Coil Type  Coil Voltage  Coil Termination  Diode  Body Material  Port Size

Code  Style  Seals / Kit No.

Code  Coil Type

Omit  Without Coil
SP*  Super Coil - 19 Watts

*Recommended

Code  Coil Voltage

Omit  Without Coil
D012  12 VDC
D024  24 VDC
A120  120/110 VAC, 60/50 Hz
A240  240/220 VAC, 60/50 Hz

*Recommended

Code  SP*  Coil Termination

Omit  Without Coil
C  Conduit With Leads
D  DIN Plug Face
A  Amp Jr. Timer†
S  Dual Spade†
L  Dual Lead Wire†
LS  Sealed Lead Wire†
H  Molded Deutsch†

†DC Only

Code  Diode

Omit  None
R  Diode

Code  Body Material

Omit  Steel
A  Aluminum

Code  Port Size  Body Part No.

Omit  Cartridge Only
16T  SAE-16  (B16-4-*16T)

* Add “A” for aluminum, omit for steel.

Parker Hannifin Corporation
Hydraulic Cartridge Systems
**Technical Information**

**Spool Type, 4-Way Valve**

**Series GS02 51**

### General Description

4-Way, 3 Position, Closed Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

### Features
- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability to 350 Bar (5000 PSI)
- One piece cartridge housing Ensures internal concentricity.
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available

### Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>17 LPM (4.5 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>‘SP’ Coil 350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Maximum Tank Pressure</td>
<td>210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.18 kg (.40 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-4 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

### Performance Curves

#### Pressure Drop vs. Flow (Through cartridge only)

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>3.5</td>
</tr>
<tr>
<td>2</td>
<td>7.0</td>
</tr>
<tr>
<td>3</td>
<td>10.5</td>
</tr>
<tr>
<td>4</td>
<td>14.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow (Q)</th>
<th>Pressure Drop (Bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>20.0</td>
</tr>
<tr>
<td>2</td>
<td>40.0</td>
</tr>
<tr>
<td>3</td>
<td>60.0</td>
</tr>
<tr>
<td>4</td>
<td>80.0</td>
</tr>
</tbody>
</table>

#### Operating Limits (Measured at 75% of Nominal Current)

<table>
<thead>
<tr>
<th>Pressure (PSI)</th>
<th>Flow (Flow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>GS02 51 (‘SP’ Coil)</td>
</tr>
<tr>
<td>70</td>
<td>Reduce Operating Limits By 10% For Manual Override</td>
</tr>
</tbody>
</table>

---

**Technical Data**

**Check Valves**

**Shuttle Valves**

**Load/Motor Controls**

**Flow Controls**

**Pressure Controls**

**Logic Elements**

**Directional Controls**

**Manual Valves**

**Solenoid Valves**

**Proportional Valves**

**Coils & Electronics**

**Bodies & Cavities**

---

Parker Hannifin Corporation
Hydraulic Cartridge Systems
Catalog HY15-3502/US

Technical Information

Spool Type, 4-Way Valve
Series GS02 51

Dimensions  Millimeters (Inches)

1 - Manual Override
(Pull or Push to Operate)

3/4 Hex.
4.1 Nm (3 lb. ft.)
Torque

39.6
(1.56)

16.0
(0.63)

53.1
(2.09)

12.7
(0.50)

33.0
(1.30)

Ordering Information

GS02  51

Code  Style  Override  Screen  Seals  Coil  Coil  Coil  Body  Port
      Size  Option  Option  Type  Voltage  Termination  Material  Size

08 Size Solenoid Valve

Code  Style  Override Options

51  High Flow and Pressure

0  Not Required

1  Manual Override

2  Detented M.O.

Code  Seals / Kit No.

N  Nitrile / Buna-N (Std.)
(SK30078N-1)

V  Fluorocarbon /
(SK30078V-1)

Code  Coil Type

Omit  Without Coil

SP  Super Coil - 19 Watts

Code  Coil Voltage

Omit  Without Coil

D012  12 VDC

D024  24 VDC

A120  120 VAC, 60/50 Hz

A240  240 VAC, 60/50 Hz*

Coil Type  Coil Voltage

See Super Coil 1/2" I.D.

*DC Only

* Add "A" for aluminum, omit for steel.

See Super Coil 1/2" I.D.

*DC Only

Parker Hannifin Corporation
Hydraulic Cartridge Systems
General Description
4-Way, 3 Position, Floating Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability to 350 Bar (5000 PSI)
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>15 LPM (4.0 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>‘SP’ Coil 350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Maximum Tank Pressure</td>
<td>210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.18 kg (.40 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-4 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Operating Limits (Measured at 75% of Nominal Current)
### Dimensions

Millimeters (Inches)

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>53</td>
<td>Not Required</td>
<td></td>
<td></td>
<td>Without Coil</td>
<td>Without Coil</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>53</td>
<td>Manual Override</td>
<td></td>
<td></td>
<td>Without Coil</td>
<td>12 VDC</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>53</td>
<td>Detented M.O.</td>
<td></td>
<td></td>
<td>Without Coil</td>
<td>24 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>53</td>
<td></td>
<td></td>
<td></td>
<td>Without Coil</td>
<td>120 VAC, 60/50 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>53</td>
<td></td>
<td></td>
<td></td>
<td>Without Coil</td>
<td>240 VAC, 60/50 Hz*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*22 Watts

---

### Ordering Information

**GS02** 53
8 Size Solenoid Valve

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omit</td>
<td>Omit</td>
<td>Without Coil</td>
<td></td>
<td></td>
<td>SP</td>
<td>12 VDC</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>D012</td>
<td>SP</td>
<td>Without Coil</td>
<td></td>
<td></td>
<td>SP</td>
<td>24 VDC</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>D024</td>
<td>SP</td>
<td>Without Coil</td>
<td></td>
<td></td>
<td>SP</td>
<td>120 VAC, 60/50 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A120</td>
<td>SP</td>
<td>Without Coil</td>
<td></td>
<td></td>
<td>SP</td>
<td>240 VAC, 60/50 Hz*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*22 Watts

---

See Super Coil 1/2" I.D. Information For Terminal Connectors

---

* Add "A" for aluminum, omit for steel.
General Description

4-Way, 3 Position, Tandem Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI ΔP)</td>
<td>13.3 LPM (3.5 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Maximum Tank Pressure</td>
<td>210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.18 kg (.40 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-4 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Operating Limits (Measured at 75% of Nominal Current)
Spool Type, 4-Way Valve
Series GS02 57

Ordering Information

GS02 57

Code | Style | Override Options | Screen | Seals
--- | --- | --- | --- | ---
0 | Not Available | 0 | Not Required
1 | Manual Override | 1 | Manual Override
2 | Detented M.O. | 2 | Detented M.O.

Code | Seals / Kit No. | Coil Type | Coil Voltage
--- | --- | --- | ---
N | Nitrile / Buna-N (Std.) (SK30078N-1) | Omit | Without Coil
V | Fluorocarbon / (SK30078V-1) | SP | Super Coil - 19 Watts

Code | Coil Termination | Body Material
--- | --- | ---
Omit | Without Coil | A | Aluminum
C | Conduit With Leads | A | Amp Jr. Timer*
D | DIN Plug Face | S | Dual Spade*
A | Amp Jr. Timer* | L | Dual Lead Wire*
S | Dual Spade* | LS | Sealed Lead Wire*
L | Dual Lead Wire* | H | Molded Deutsch*
H | Molded Deutsch* | * Add "A" for aluminum, omit for steel.

Code | Port Size | Body Part No.
--- | --- | ---
Omit | Cartridge Only | 6T | SAE-6 (B08-4-*6T)
6B | 3/8" BSPG (B08-4-*6B) | *22 Watts

*22 Watts

Dimensions

1 - Manual Override
(Pull or Push to Operate)

3/4 Hex.
4.1 Nm (3 lb. ft.)
Torque

39.6 (1.56)

15.2 (0.60)

33.0 (1.33)

55.1 (2.19)

156.0 (6.14)

12.7 (0.50)

62.7 (2.47)

19.8 (0.78)

Parker Hannifin Corporation
Hydraulic Cartridge Systems
General Description
4-Way, 3 Position, Open Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Designed to operate double acting cylinders, pilot circuits and bi-directional motors, etc.
- High flow capacity with reduced space requirements
- High pressure capability
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.
- Manual override available

Specifications
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI ΔP)</td>
<td>13.3 LPM (3.5 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Maximum Tank Pressure</td>
<td>210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.18 kg (.40 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C08-4 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves
Pressure Drop vs. Flow (Through cartridge only)

Operating Limits (Measured at 75% of Nominal Current)
### Spool Type, 4-Way Valve
#### Series GS02 59

#### Technical Information

**Dimensions** Millimeters (Inches)

1. **Manual Override** (Pull or Push to Operate)
2. **3/4 Hex.**
3. **4.1 Nm (3 lb. ft.)**
4. **Torque**

**See Super Coil 1/2" I.D.**

**Information For Terminal Connectors**

- **7/8 Hex.**
- **30 Nm (22 lb. ft.)**
- **Torque**

#### Ordering Information

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Screen</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS02</td>
<td>59</td>
<td>0</td>
<td></td>
<td></td>
<td>SP</td>
<td></td>
<td>Omit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>Omit</td>
<td>12 VDC</td>
<td>Without Coil</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>Omit</td>
<td>24 VDC</td>
<td>With Leads</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Omit</td>
<td>120 VAC, 60/50 Hz</td>
<td>DIN Plug Face</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Omit</td>
<td>240 VAC, 60/55 Hz</td>
<td>Amp Jr. Timer*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Technical Data

- **CV**
- **SH**
- **LM**
- **LM**
- **PC**
- **FC**
- **PC**
- **Pv**
- **PV**
- **SV**
- **SV**
- **SV**
- **SV**
- **SV**
- **SV**
- **SV**
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- **SV**
- **SV**
- **SV**
- **SV**
- **SV**
- **SV**
- **SV**
- **SV**
- **SV**
- **SD**
- **CE**
- **BC**
- **TD**

Parker Hannifin Corporation
Hydraulic Cartridge Systems
Technical Information

Catalog HY15-3502/US

Spool Type, 4-Way 3 Position Valve
Series DSL105

General Description

4-Way Spool Valves. For additional information see Technical Tips on pages SV1-SV6.

Features

- High flow capacity with reduced space requirements
- Standard valve bodies and common cavities
- Replaceable, one piece encapsulated coils with minimal amperage draw
- Manual overrides, seal variations and other options available
- Oil immersed armature solenoid, no dynamic seals
- Variety of coil terminations and voltages
- Polyurethane “D”-Ring

Specifications

<table>
<thead>
<tr>
<th>Rated Flow</th>
<th>C2, C7, C9 18.8 LPM (5 GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1, C4 26.5 LPM (7 GPM)</td>
</tr>
</tbody>
</table>

- Maximum Inlet Pressure: 250 Bar (3600 PSI)
- Leakage at 150 SSU (32 cSt): 160 cc/min. (10 in³/min.)
- Minimum Operating Voltage: 85% of rated voltage at 20°C (72°F).
- Response Time: 40 - 150 ms
- Cartridge Material: All parts steel. All operating parts hardened steel.
- Operating Temp. Range/Seals: -45°C to +93.3°C (“D”-Ring) (-50°F to +200°F)
  -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)
- Fluid Compatibility/Viscosity: Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)
- Filtration: ISO Code 16/13, SAE Class 4 or better
- Approx. Weight: .29 kg (.64 lbs.)
- Cavity: C10-4
- Form Tool: Rougher NFT10-4R, Finisher NFT10-4F

Curve Selection Chart

<table>
<thead>
<tr>
<th>SPOOL CODE</th>
<th>SPOOL SHIFTED</th>
<th>SPOOL CENTERED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 to 2</td>
<td>3 to 1</td>
</tr>
<tr>
<td></td>
<td>4 to 1</td>
<td>5 to 1</td>
</tr>
<tr>
<td></td>
<td>4 to 2</td>
<td>5 to 2</td>
</tr>
<tr>
<td></td>
<td>4 to 3</td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>C2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>C4</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>C5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>C7</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>C8</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)

---

Parker Hannifin Corporation
Hydraulic Cartridge Systems
Spool Type, 4-Way 3 Position Valve
Series DSL105

Dimensions

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Seals / Kit. No.</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td></td>
<td>Omit None</td>
<td>“D”-Ring / (SK10-4)</td>
<td>SP*</td>
<td>Without Coil</td>
<td>Without Coil</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td></td>
<td>M Push/Pull</td>
<td>Nitrile / (SK10-4N)</td>
<td></td>
<td>12 VDC</td>
<td>Thru-Hole</td>
<td>Aluminum</td>
<td>C2</td>
</tr>
<tr>
<td>C4</td>
<td></td>
<td>S1 (3X1)</td>
<td>V Fluorocarbon / (SK10-4V)</td>
<td></td>
<td>24 VDC</td>
<td>Thru-Hole</td>
<td>Aluminum</td>
<td>C4</td>
</tr>
<tr>
<td>C7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A120 120/110 VAC, 60/50 Hz</td>
<td></td>
<td>Aluminum</td>
<td>C7</td>
</tr>
<tr>
<td>C8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A240 240/220 VAC, 60/50 Hz</td>
<td></td>
<td>Aluminum</td>
<td>C8</td>
</tr>
</tbody>
</table>

NOTE: Spacer must be installed between coils, and is provided with cartridge.

Ordering Information

DSL105

10 Size Solenoid Valve

Code Style Override Options Seals / Kit. No. Coil Type Coil Voltage Coil Termination Body Material Port Size

C1 S1 (3X1) Omit None “D”-Ring / (SK10-4) SP* Without Coil Without Coil Thru-Hole Steel

C2 S1 (3X1) M Push/Pull Nitrile / (SK10-4N) SP* 12 VDC Thru-Hole Aluminum C2

C4 S1 (3X1) S2 (2X4) V Fluorocarbon / (SK10-4V) SP* 24 VDC Thru-Hole Aluminum C4

C7 S1 (3X1) S2 (2X4) A120 120/110 VAC, 60/50 Hz

C8 S1 (3X1) S2 (2X4) A240 240/220 VAC, 60/50 Hz

*Recommended

NOTE:
- Spacer must be installed between coils, and is provided with cartridge.
- Code Style
  - C1, C2, C4, C7, C8
- Code Override Options
  - None
  - M Push/Pull
- Code Seals / Kit. No.
  - “D”-Ring / (SK10-4)
  - Nitrile / (SK10-4N)
  - V Fluorocarbon / (SK10-4V)
- Code Coil Type
  - Without Coil
  - SP* Super Coil - 28 Watts

Code Body Material

Omit Steel

A Aluminum

Code Port Size Body Part No.

Omit Cartridge Only

6P 3/8” NPTF (B10-4-6P)

6T SAE-6 (B10-4-6T)

8T SAE-8 (B10-4-8T)

6B 3/8” BSPG (B10-4-6B)†

* Add “A” for aluminum, omit for steel.† Steel bodies only

SV92 Parker Hannifin Corporation
Hydraulic Cartridge Systems
General Description

4-Way, 3 Position, Closed Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Four way closed center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>42 LPM (11 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time Open</td>
<td>30-60 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.26 kg (.58 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C10-4 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow Energized - GS045250ND
(Through cartridge only)

Operating Limits (Measured at 75% of Nominal Current)
Spool Type, 4-Way Valve
Series GS04 52D

Catalog HY15-3502/US
Parker Hannifin Corporation
Hydraulic Cartridge Systems

Technical Information

Ordering Information

GS04 52

10 Size
Solenoid Valve

Code Style Override Screen Seals Design Level Coil Type Coil Voltage Coil Termination Body Material Port Size

Code | Style | Override Option | Screen | Seals | Design Level | Coil Type | Coil Voltage | Coil Termination | Body Material | Port Size
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
52 | Style | Override Option | Screen | Seals | Design Level | Coil Type | Coil Voltage | Coil Termination | Body Material | Port Size

*Force to push at 210 Bar (3000 PSI). Less to pull.

See Super Coil 5/8” I.D. Information For Terminal Connectors

* Add “A” for aluminum, omit for steel.
General Description

4-Way, 3 Position, Floating Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Four way floating center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coils: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>42 LPM (11 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time Open</td>
<td>30-60 ms</td>
</tr>
<tr>
<td></td>
<td>Close 20-40 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F) -31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/ Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.26 kg (.58 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C10-4 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow Energized - GS045450ND (Through cartridge only)

Operating Limits (Measured at 75% of Nominal Current)
Spool Type, 4-Way Valve
Series GS04 54D

Dimensions

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Options</th>
<th>Screen</th>
<th>Seals</th>
<th>Design Level</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
<td>D</td>
<td>SP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Code
- 54: High Flow and Pressure (SP Coil)
- 0: None
- 5: Standard - Latch Operated, Pull and Push (*40 n/3 lbs.)

*Force to push at 210 Bar (3000 PSI). Less to Pull.

Seals / Kit No.
- N: Nitrile / Buna-N (Std.) (SK30506N-1)
- V: Fluorocarbon / (SK30506V-1)

Coil Type
- Omit: Without Coil
- SP: Super Coil - 28 Watts

Coil Voltage
- Omit: Without Coil
- D012: 12 VDC
- D024: 24 VDC
- A120: 120 VAC, 60/50 Hz
- A240: 240 VAC, 60/50 Hz

Body Material
- Omit: Steel
- A: Aluminum

Port Size
- 8T: SAE-8 (B10-4-*8T)
- 8B: 1/2" BSPG (B10-4-*8B)

* Add "A" for aluminum, omit for steel.

Seals Screen Override Option
- Code: Seals / Kit No.
- Code: Override Options

Ordering Information

GS04 54

10 Size Solenoid Valve

See Super Coil 5/8" I.D. Information For Terminal Connectors
General Description

4-Way, 3 Position, Tandem Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way tandem center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>42 LPM (11 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F)</td>
</tr>
<tr>
<td>Response Time</td>
<td>Open 30-60 ms, Close 20-40 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.26 kg (.58 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C10-4 (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Operating Limits (Measured at 75% of Nominal Current)
**Dimensions**  

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Screen</th>
<th>Seals</th>
<th>Design Level</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>Standard - Latch Operated, Pull and Push (&quot;40 n/3 lbs.&quot;)</td>
<td></td>
<td></td>
<td>Includes Industry Common Cavity</td>
<td>Without Coil</td>
<td></td>
<td>Steel</td>
<td>Cartridge Only</td>
</tr>
<tr>
<td>5</td>
<td>None</td>
<td>Standard - Latch Operated, Pull and Push (&quot;40 n/3 lbs.&quot;)</td>
<td></td>
<td></td>
<td>Includes Industry Common Cavity</td>
<td>Without Coil</td>
<td></td>
<td>Aluminum</td>
<td>Cartridge Only</td>
</tr>
</tbody>
</table>

**Seals / Kit No.**  
- **N** Nitrile / Buna-N (Std.)
- **V** Fluorocarbon / PTFE

**Coil Termination**  
- **C** Conduit With Leads
- **D** DIN Plug Face
- **A** Amp Jr. Timer*
- **S** Dual Spade*
- **L** Dual Lead Wire*
- **LS** Sealed Lead Wire*
- **H** Molded Deutsch*

**Coil Voltage**  
- **D012** 12 VDC
- **D024** 24 VDC
- **A120** 120 VAC, 60/50 Hz
- **A240** 240 VAC, 60/50 Hz

*Add "A" for aluminum, omit for steel.

---

**Technical Data**  

- **SH** Solenoid Valves
- **PC** Pressure Controls
- **LE** Logic Elements
- **DC** Directional Controls
- **MV** Manual Valves
- **CV** Check Valves
- **SV** Solenoid Valves
- **PV** Proportional Valves
- **BC** Coils & Electronics
- **TD** Technical Data
General Description
4-Way, 3 Position, Open Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Four way open center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI DP)</td>
<td>42 LPM (11 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>85% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time Open</td>
<td>30-60 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-40°C to +93.3°C (Nitrile) (-40°F to +200°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.26 kg (.58 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C10-4</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Operating Limits (Measured at 75% of Nominal Current)
Spool Type, 4-Way Valve
Series GS04 59D

Dimensions
Millimeters (Inches)

Code | Style | Override | Screen | Seals | Design | Coil | Coil | Coil | Body | Port
10 Size Solenoid Valve | 59 | Option | | | Level | Type | Voltage | Termination | Material | Size

Code | Seals / Kit No.
N | Nitrile / Buna-N (Std.) (SK30506N-1)
V | Fluorocarbon / (SK30506V-1)

Code | Design Level
D | Includes Industry Common Cavity

Code | Coil Type
Omit | Without Coil
SP | Super Coil - 28 Watts

Code | Coil Voltage
Omit | Without Coil
D012 | 12 VDC
D024 | 24 VDC
A120 | 120 VAC, 60/50 Hz
A240 | 240 VAC, 60/50 Hz

Code | Body Material
Omit | Steel
A | Aluminum

Code | Port Size | Body Part No.
Omit | Cartridge Only
8T | SAE-8 (B10-4-*8T)
8B | 1/2" BSPG (B10-4-*8B)

See Super Coil 5/8" I.D. Information For Terminal Connectors

Manual Override (Latch and Pull or Push)

1.50 (0.62)

191.2 (7.53)

25.4 Dia (1.00)

62.7 (2.47)

19.0 (0.75)

50.0 (1.97)

50.0 (1.97)

22.0 (0.86)

36.0 (1.43)

66.5 (2.62)

*22 Watts

* Add "A" for aluminum, omit for steel.

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.

See Super Coil 5/8" I.D.

Information For Terminal Connectors

7/8-14 UNF

1" Hex.

34 Nm (25 lb. ft.)

Torque

*22 Watts

7/16" I.D.
Technical Information

General Description
4-Way, 3 Position, Closed Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features
- Four way closed center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>57 LPM (15 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>75% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time Energized</td>
<td>30-60 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (Nitrile) (-50°F to +200°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.45 kg (1.0 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C12-4L (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves
Pressure Drop vs. Flow
(Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)
Catalog HY15-3502/US
Parker Hannifin Corporation
Hydraulic Cartridge Systems

Check Valves
Shuttle Valves
Load/Motor Controls
Flow Controls
Pressure Controls
Logic Elements
Directional Controls
Manual Valves
Proportional Valves
Coils & Electronics

Technical Data

Dimens advantages
Millimeters (Inches)

Ordering Information

DSH125 52
12 Size Solenoid Valve
Style Override Option Seals Coil Type Coil Voltage Coil Termination Diode Body Material Port Size

Code Style Override Option Seals Coil Type Coil Voltage Coil Termination Diode Body Material Port Size

52 High Flow ("SP" Coil) None (Consult Factory) Without Coil Omit Without Coil Omit Without Coil Omit Steel
DN Latch Operated** C Conduit With Leads D DIN Plug Face S Dual Spade* L Dual Lead Wire* LS Sealed Lead Wire* H Molded Deutsch

Code Seals / Kit No.
N Nitrile / Buna-N (Std.) (SK12-4LN)
V Fluorocarbon / (SK12-4LV)

Code Coil Type
Omit Without Coil SP Super Coil - 28 Watts

Code Coil Voltage
Omit Without Coil DB12 12 VDC DB24 24 VDC

A120 120 VAC, 60/50 Hz A240 240 VAC, 60/50 Hz

*22 Watts

Code Coil Type
Omit Without Coil C Conduit With Leads D DIN Plug Face S Dual Spade*

L Dual Lead Wire* LS Sealed Lead Wire* H Molded Deutsch

Code Body Material
Omit Steel A Aluminum

Code Port Size

12T Cartridge Only

12T SAE-12 (B12-4L-12T)

1/2" ID.

* Add "A" for aluminum, omit for steel.

See Super Coil 5/8” I.D. Information For Terminal Connectors

Manual Override (Latch and Pull or Push)

Pull S1

Push S2

25.4 (1.00) Dia. Finger Tight Torque 4.1 Nm (3 lb. ft.)

1-1/4” Hex. 74 Nm (55 lb. ft.) Torque

1-1/16-12UN-2A Thread

See Super Coil 5/8” I.D. Information For Terminal Connectors

Manual Override (Latch and Pull or Push)

Pull and Push M.O. Neutral Detent

4.8 (.19)

19.1 (0.75)

93.2 (3.67)

225.2 (8.87)

132.0 (5.20)

50.0 (1.97)

50.0 (1.97)

8.3 (0.33)

35.8 (1.41)

1-1/16-12UN-2A

Thread

1/2” ID.

74 Nm (55 lb. ft.)

2.62 (1.00)

66.5 (2.62)

22.0 (0.86)

36.0 (1.43)

Finger Tight Torque 4.1 Nm (3 lb. ft.)

4.1 Nm (3 lb. ft.)

2.2 Nm (0.60)

74 Nm (55 lb. ft.)

3.67 (1.45)

1.97 (0.77)

8.3 (.33)

Finger Tight Torque 4.1 Nm (3 lb. ft.)

1.97 (0.77)

8.3 (.33)

1.45 (0.57)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

55 lb. ft.

22 Nm (8.35)

3.67 (1.45)

1.97 (0.77)

8.3 (.33)

Finger Tight Torque 4.1 Nm (3 lb. ft.)

1.97 (0.77)

8.3 (.33)

1.45 (0.57)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)

66.5 (2.62)

2.62 (1.01)

6.0 (0.24)

14.6 (0.58)

29.4 (1.16)

50.0 (1.97)

33.0 (1.30)

32.0 (1.26)

74 Nm (55 lb. ft.)

22 Nm (8.35)
General Description

4-Way, 3 Position, Floating Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way floating center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>57 LPM (15 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>75% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized 30-60 ms</td>
</tr>
<tr>
<td></td>
<td>De-Energized 20-40 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (Nitrile) (-50°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.45 kg (1.0 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C12-4L (See BC Section for more details)</td>
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</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)
Spool Type, 4-Way Valve
Series DSH125 54

Dimensions

Millimeters (Inches)

Ordering Information

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>54</td>
<td>None (Consult Factory)</td>
<td>N</td>
<td>Without Coil</td>
<td>D012 12 VDC</td>
<td>Omit</td>
<td>Steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>Latch Operated**</td>
<td>V</td>
<td>Super Coil - 28 Watts</td>
<td>D024 24 VDC</td>
<td>SP</td>
<td>Aluminum</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>Omit</td>
<td></td>
<td>Omit</td>
<td>A120 120 VAC, 60/50 Hz</td>
<td>DP</td>
<td>XXW</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>Omit</td>
<td></td>
<td>Omit</td>
<td>A240 240 VAC, 60/50 Hz*</td>
<td>DP</td>
<td>H</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See Super Coil 5/8" I.D. Information For Terminal Connectors

*40 ft/lb

Pull and Push M.O. Neutral Detent

**40 nt/9 lbs.

Manual Override
Latch and Pull or Push

Finger Tight Torque 4.1 Nm (3 lb. ft.)

Normal
Shifted

Neutral Detent

Adapt and Push M.O.

1-1/16-12UN-2A Thread

Pull
S1

Push
S2

Manual Override

35.8 (1.41)

8.3 (0.33)

50.0 (1.97)

50.0 (1.97)

132.0 (5.20)

225.2 (8.87)

25.4 (1.00) Dia.

19.1 (0.75)

4.8 (0.19)

1-1/4" Hex.

74 Nm (55 lb. ft.)

1-1/16-12UN-2A Thread

50.0 (1.97)

25.4 (1.00) Dia.

36.0 (1.43)

22.0 (0.86)

66.5 (2.62)

20.6 (0.81)

SP

S

L

LS

H

See Super Coil 5/8" I.D.

See Super Coil 5/8" I.D.

*22 Watts

*A for aluminum, omit for steel.

Technical Data

Technical Information

Manual Valves

Solenoid Valves

Flow Controls

Pressure Controls

Logic Elements

Directional Controls

Proportional Valves

Coils & Electronics

Coil Termination

Coil Type

Diode

Body Material

Port Size

Omit

Proportional Valves

Technical Data

Parker Hannifin Corporation
Hydraulic Cartridge Systems

SV104

Catalog HY15-3502/US

Technical Information

Spool Type, 4-Way Valve
Series DSH125 54

Dimensions

Millimeters (Inches)

Ordering Information

<table>
<thead>
<tr>
<th>Code</th>
<th>Style</th>
<th>Override Option</th>
<th>Seals</th>
<th>Coil Type</th>
<th>Coil Voltage</th>
<th>Coil Termination</th>
<th>Diode</th>
<th>Body Material</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>54</td>
<td>None (Consult Factory)</td>
<td>N</td>
<td>Without Coil</td>
<td>D012 12 VDC</td>
<td>Omit</td>
<td>Steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>Latch Operated**</td>
<td>V</td>
<td>Super Coil - 28 Watts</td>
<td>D024 24 VDC</td>
<td>SP</td>
<td>Aluminum</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>Omit</td>
<td></td>
<td>Omit</td>
<td>A120 120 VAC, 60/50 Hz</td>
<td>DP</td>
<td>XXW</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>Omit</td>
<td></td>
<td>Omit</td>
<td>A240 240 VAC, 60/50 Hz*</td>
<td>DP</td>
<td>H</td>
<td></td>
<td></td>
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</tbody>
</table>

See Super Coil 5/8" I.D. Information For Terminal Connectors

*40 ft/lb

Pull and Push M.O. Neutral Detent

**40 nt/9 lbs.

Manual Override
Latch and Pull or Push

Finger Tight Torque 4.1 Nm (3 lb. ft.)

Normal
Shifted

Neutral Detent

Adapt and Push M.O.

1-1/16-12UN-2A Thread

Pull
S1

Push
S2

Manual Override

35.8 (1.41)

8.3 (0.33)

50.0 (1.97)

50.0 (1.97)

132.0 (5.20)

225.2 (8.87)

25.4 (1.00) Dia.

19.1 (0.75)

4.8 (0.19)

1-1/4" Hex.

74 Nm (55 lb. ft.)

1-1/16-12UN-2A Thread

50.0 (1.97)

25.4 (1.00) Dia.

36.0 (1.43)

22.0 (0.86)

66.5 (2.62)

20.6 (0.81)

SP

S

L

LS

H

See Super Coil 5/8" I.D.

See Super Coil 5/8" I.D.

*22 Watts

*A for aluminum, omit for steel.

Technical Data

Technical Information

Manual Valves

Solenoid Valves

Flow Controls

Pressure Controls

Logic Elements

Directional Controls

Proportional Valves

Coils & Electronics

Coil Termination

Coil Type

Diode

Body Material

Port Size

Omit

Proportional Valves

Technical Data

Parker Hannifin Corporation
Hydraulic Cartridge Systems

SV104
General Description

4-Way, 3 Position, Tandem Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way tandem center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow (At 70 PSI AP)</td>
<td>57 LPM (15 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>75% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized 30-60 ms</td>
</tr>
<tr>
<td></td>
<td>De-Energized 20-40 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (Nitrile) (-50°F to +200°F)</td>
</tr>
<tr>
<td></td>
<td>-31.7°C to +121.1°C (Fluorocarbon) (-25°F to +250°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.45 kg (1.0 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C12-4L (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)

Shifts:

- 3 to 2 (P to A) and 3 to 4 (P to B) Energized
- 2 to 1 (A to T) Energized
- 3 to 1 (P to T) De-Energized
- 4 to 1 (B to T) Energized
Dimensions  Millimeters (Inches)

Ordering Information

<table>
<thead>
<tr>
<th>DSH125 57</th>
<th>12 Size</th>
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<td>Seals</td>
<td>Coil Type</td>
<td>Coil Voltage</td>
<td>Coil Termination</td>
<td>Diode</td>
</tr>
<tr>
<td>57</td>
<td>High Flow (*SP Coil)</td>
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<tr>
<td>Code Override Options</td>
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<td></td>
</tr>
<tr>
<td>Omit</td>
<td>None (Consult Factory)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DN</td>
<td>Latch Operated**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| *"40 ft/lb.

| Code  | Seals / Kit No. |  |  |  |  |  |  |
|-------|-----------------|-----------------|--------------|-----------------|----------|
| N | Nitrile / Buna-N (Std.) (SK12-4LN) |  |  |  |  |  |  |
| V | Fluorocarbon / (SK12-4LV) |  |  |  |  |  |  |
General Description

4-Way, 3 Position, Open Center Spool Valve. For additional information see Technical Tips on pages SV1-SV6.

Features

- Four way open center valve designed to operate double acting cylinders and bi-directional motors, etc.
- One piece cartridge housing ensures internal concentricity
- Coil: Waterproof, hermetically sealed, requires no O’Rings; Symmetrical coil can be reversed without affecting performance.
- All external parts zinc plated

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Flow</td>
<td>57 LPM (15 GPM)</td>
</tr>
<tr>
<td>Maximum Inlet Pressure</td>
<td>350 Bar (5000 PSI)</td>
</tr>
<tr>
<td>Leakage at 150 SSU (32 cSt)</td>
<td>160 cc/min @ 210 Bar (3000 PSI)</td>
</tr>
<tr>
<td>Minimum Operating Voltage</td>
<td>75% of rated voltage at 20°C (72°F).</td>
</tr>
<tr>
<td>Response Time</td>
<td>Energized: 30-60 ms, De-Energized: 20-40 ms</td>
</tr>
<tr>
<td>Cartridge Material</td>
<td>All parts steel. All operating parts hardened steel.</td>
</tr>
<tr>
<td>Operating Temp. Range/Seals</td>
<td>-45°C to +93.3°C (Nitrile) (-50°F to +200°F)</td>
</tr>
<tr>
<td>Fluid Compatibility/Viscosity</td>
<td>Mineral-based or synthetic with lubricating properties at viscosities of 45 to 2000 SSU (6 to 420 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO Code 16/13, SAE Class 4 or better</td>
</tr>
<tr>
<td>Approx. Weight</td>
<td>.45 kg (1.0 lbs.)</td>
</tr>
<tr>
<td>Cavity</td>
<td>C12-4L (See BC Section for more details)</td>
</tr>
</tbody>
</table>

Performance Curves

Pressure Drop vs. Flow (Through cartridge only)

Shift Limit Characteristics (Min. Operating Voltage)
Spool Type, 4-Way Valve
Series DSH125 59

Dimensions  Millimeters (Inches)

Ordering Information

Code | Style |
--- | --- |
59 | High Flow ("SP" Coil) |

Code | Override Options |
--- | --- |
Omit | None (Consult Factory) |
DN | Latch Operated** |

* "40 nt/9 lbs.

Code | Seals / Kit No. |
--- | --- |
N | Nitrile / Buna-N (Std.) (SK12-4LN) |
V | Fluorocarbon / (SK12-4LV) |

Code | Coil Type |
--- | --- |
Omit | Without Coil |
SP | Super Coil - 28 Watts |

Code | Coil Voltage |
--- | --- |
Omit | Without Coil |
D012 | 12 VDC |
D024 | 24 VDC |
A120 | 120 VAC, 60/50 Hz |
A240 | 240 VAC, 60/50 Hz* |

*22 Watts

Code | Coil Termination |
--- | --- |
Omit | Without Coil |
C | Conduit With Leads |
D | DIN Plug Face |
S | Dual Spade* |
L | Dual Lead Wire* |
LS | Sealed Lead Wire* |
H | Molded Deutsch* |

Code | Body Material |
--- | --- |
Omit | Steel |
A | Aluminum |

Code | Port Size | Body Part No. |
--- | --- | --- |
Omit | Cartridge Only |
12T | SAE-12 (B12-4L"12T) |

** Add "A" for aluminum, omit for steel.