APPLICATION LIMITS

These products are intended for use in general purpose compressed air systems only.

Operating pressure range:  
Minimum*: 35  |  2.41  |  241  
Maximum (Standard) 150  |  10.34  |  1034  
(Low Watt) 100  |  6.89  |  689  

* For lower pressure or vacuum operation, solenoid(s) may be externally piloted (35 psig min.) following the conversion procedure on these instructions.

Operating Temperature Range: 20°F (7°C) to 140°F (60°C)

Voltage Range:  +10% to -15% of rating

WIRING INSTRUCTIONS

Units with flying leads

Single Solenoid: Use wires marked “2” and “3” for connection to the solenoid. Either may be “Hot”.

Double Solenoid: Use wires marked “1” and “2” for Solenoid “12”. Either may be “Hot”. Use wires marked “3” and “4” for Solenoid “14”. Either may be “Hot”.

CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 2 for single solenoid valves and wire numbers 1 and 4 for double solenoid valves as positive.

CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold or subbase and connect a ground lead to the green ground screw.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

Units with 3-Pin, 4-Pin, or 5-Pin Connectors:

See installation instructions packed with or decal on subbase or manifold.

PORT IDENTIFICATION / CONNECTIONS

### 4-Way Service

<table>
<thead>
<tr>
<th>Port No.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inlet</td>
</tr>
<tr>
<td>2</td>
<td>Cylinder</td>
</tr>
<tr>
<td>3</td>
<td>Exhaust</td>
</tr>
<tr>
<td>4</td>
<td>Cylinder</td>
</tr>
<tr>
<td>5</td>
<td>Exhaust</td>
</tr>
<tr>
<td>12</td>
<td>Remote Pilot</td>
</tr>
<tr>
<td>14</td>
<td>Remote Pilot</td>
</tr>
<tr>
<td>X</td>
<td>External Pilot</td>
</tr>
</tbody>
</table>

### 3-Position, 4-Way All Ports Blocked

### 3-Position, 4-Way Pressure to Cylinder

### 3-Position, 4-Way Cylinder to Exhaust
CONVERSION PROCEDURE FOR EXTERNAL PILOT

Internal/External Pilot Conversion – Valves are field convertible to an external pilot supply for applications where pressure supplied to the valve inlet is lower than the specified service limitations, including vacuum or dual pressure service and applications using sandwich regulators.

VALVES WITH BLACK COVERS
1. Remove two recessed Phillips-head screws securing valve cover.
2. Lift cover off valve.
3. Remove the rubber selector and reposition with the number “2” aligned with the pointer on the valve body.
4. Replace cover on valve and tighten screws to 10 – 12 in.-lbs.
5. Connect pressure signal (between 35 and maximum psig) to port “X”, “12” or “14” on valve body or base. (This step is not necessary when converting valve for use with sandwich regulators).

VALVES WITH LIGHT GREY COVERS
1. Loosen two recessed Phillips-head screws securing valve cover.
2. Loosen selector by lightly tapping on cover with plastic mallet.
3. Turn selector to align with number “2” on valve cover.
4. Tighten screws to 20 in.-lbs.
5. Same as Step 5 above.

Coil Replacement Chart

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Coil Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Hz</td>
<td></td>
</tr>
<tr>
<td>50 Hz</td>
<td></td>
</tr>
<tr>
<td>D.C.</td>
<td></td>
</tr>
<tr>
<td>19” Leads</td>
<td>Plug-In*</td>
</tr>
<tr>
<td>24</td>
<td>K933169</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>24</td>
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<tr>
<td></td>
<td>24***</td>
</tr>
<tr>
<td></td>
<td>24****</td>
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<td>120</td>
<td>110</td>
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<tr>
<td>240</td>
<td>—</td>
</tr>
<tr>
<td>120 &lt;&gt; 110 &lt;&gt;</td>
<td>K93325</td>
</tr>
</tbody>
</table>

*For use with valve model numbers not ending with “B”.
** For use with valve model numbers ending with “B”.
*** Low watt.
**** Low watt with arc suppression.
<> Arc suppression.

For voltages and options not listed, consult your local representative.

WARNING

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WARNING

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer’s specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

Introduction

Follow these instructions when installing, operating, or servicing the product.

Application Limits

These products are intended for use in general purpose compressed air systems only.

Operating pressure range: PSIG bar kPa
Minimum* 35 2.41 241
Maximum (Standard) 150 10.34 1034
(LOW Watt) 100 6.89 689
* For lower pressure or vacuum operation, solenoid(s) may be externally piloted (35 psig min.) following the conversion procedure on these instructions.

Operating Temperature Range: 20°F (7°C) to 140°F (60°C)
Voltage Range: +10% to -15% of rating

Wiring Instructions

Units with flying leads

Single Solenoid: Use wires marked “2” and “3” for connection to the solenoid. Either may be “Hot”.

Double Solenoid: Use wires marked “1” and “2” for Solenoid “12”. Either may be “Hot”. Use wires marked “3” and “4” for Solenoid “14”. Either may be “Hot”.

CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 2 for single solenoid valves and wire numbers 1 and 4 for double solenoid valves as positive.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold or subbase and connect a ground lead to the green ground screw.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

Conversion Procedure For External Pilot

Internal/External Pilot Conversion – Valves are field convertible to an external pilot supply for applications where pressure supplied to the valve inlet is lower than the specified service limitations, including vacuum or dual pressure service and applications using sandwich regulators.

Valves With Black Covers

1. Remove two recessed Phillips-head screws securing valve cover.
2. Lift cover off valve.
3. Remove the rubber selector and reposition with the number “2” aligned with the pointer on the valve body.
4. Replace cover on valve and tighten screws to 10 – 12 in.-lbs.
5. Connect pressure signal (between 35 and maximum psig) to port “X”, “12” or “14” on valve body or base. (This step is not necessary when converting valve for use with sandwich regulators).

Valves With Light Grey Covers

1. Loosen two recessed Phillips-head screws securing valve cover.
2. Loosen selector by lightly tapping on cover with plastic mallet.
3. Turn selector to align with number “2” on valve cover.
4. Tighten screws to 20 in.-lbs.
5. Same as Step 5 above.

Pilot Selector Code

Position Operator Type Pilot Supply Sandwitch Regulator Port 12 Port 14
1 Solenoid Internal No Plug Plug
2 Solenoid External No Plug Plug
3 Single Pilot N/A No Plug Pilot Signal
4 Double Pilot N/A No Pilot Signal Pilot Signal
1 Solenoid Internal Yes Plug Plug
2 Solenoid External Yes Plug Plug
3 Single Pilot N/A Yes ** Pilot Signal
4 Double Pilot N/A Yes Pilot Signal Pilot Signal

* Supply 35 – 150 PSIG (35 – 100 PSIG for low watt) (or at port “X” if applicable).
** Supply 35 – 150 PSIG (35 – 100 PSIG for low watt).

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**Service Procedures**

**NOTE:** All cleaning of parts to be done with mineral spirits or equivalent cleaning solution. Grease should be a mineral based lubricant (Magnalube G). All parts showing nicks, scratches or other signs of wear or damage should be replaced.

1. Mark end sections to ensure re-assembly on the proper end. Remove two socket head screws from each end section and detach.
   **NOTE:** Valves with model numbers ending in "B" have end sections with wiring that cannot be detached. Wire length is sufficient for service access. Remove spring (where applicable).
2. Remove spool and clean. Note which end spring or spring bore in spool was on.
3. Remove molded seal from each end of body and discard.
4. Remove end spacers, spacers, seal retainers, and o-rings (C & D). Discard o-rings. Clean body and all retained parts.
5. Lightly grease new o-rings (C & D) and install onto seal retainers.
6. Using the spool as a mandrel, begin reassembly by sliding a seal retainer (outside o-ring (C) facing downward) over the spool and push down. Then stack a spacer on top of the seal retainer. Next, stack a seal retainer (outside o-ring facing upward). Repeat this process alternating seal retainer orientation each time. The final assembly should have outside o-rings (C) showing at each end of the spool.
7. Grease the outside of this assembly and gently slide it into the valve body. (On spring return valves, the hollow end of the spool goes on the spring return end.)
8. Lightly grease new end gaskets (B) and place in grooves in ends of body.
9. **Solenoid and Remote Operated End Sections** – Remove piston from bore. Remove lipseal (A) and discard. Clean piston and housing bore. Grease new lipseal and assemble to piston. Reassemble piston into housing (lipseal end first). Reassemble end sections to body torquing screws to 40 in.-lbs.
10. **Spring Return End Sections** – Slide spring into bore in end of spool. Compress spring while assembling end housing to body with socket head screws. Torque screws to 30-35 in.-lbs.
11. **Manual Override Service** – Remove the two Phillips-head screws securing the manual override on the solenoid end(s). Discard seal (E) and o-ring (F) and the two seated o-rings (G) in the override bore. Clean the override and its bore and install new o-rings. Lightly grease all seals and reinstall the override with the two screws making sure to insert locking style override with the slot vertical so that only 90° of clockwise rotation is possible.

**Available Service Items**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K352386</td>
<td>Seal Kit</td>
</tr>
<tr>
<td>K152008</td>
<td>Locking Override</td>
</tr>
<tr>
<td>K162005</td>
<td>Flush Non-locking Override</td>
</tr>
<tr>
<td>K162006</td>
<td>Ext. Non-locking Override</td>
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<tr>
<td>H19109</td>
<td>Indicator Lamp (120/60 AC)*</td>
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<tr>
<td>H19110</td>
<td>Indicator Lamp (24V DC)*</td>
</tr>
<tr>
<td>K252009</td>
<td>Indicator Lamp (120/60 AC)**</td>
</tr>
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<td>K252008</td>
<td>Indicator Lamp (24V DC)**</td>
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<tr>
<td>K232025</td>
<td>Plunger &amp; Guide (Standard)</td>
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<tr>
<td>K232027</td>
<td>Plunger &amp; Guide (Low Watt)</td>
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<tr>
<td>K473053</td>
<td>Return Spring</td>
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<tr>
<td>K663006</td>
<td>Interface Seal</td>
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</table>

**Coil Replacement Chart**

**Voltage**

<table>
<thead>
<tr>
<th>60 Hz</th>
<th>50 Hz</th>
<th>D.C.</th>
<th>19&quot; Leads</th>
<th>Plug-In*</th>
<th>Plug-In w/ Light**</th>
<th>Plug-In w/ Light**</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
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<td>—</td>
<td>K593175</td>
<td>K593248</td>
<td>K593294</td>
</tr>
</tbody>
</table>

* For use with valve model numbers not ending with “B”.
** For use with valve model numbers ending with “B”.
*** Low watt.
**** Low watt with arc suppression.
† Arc suppression.

For voltages and options not listed, consult your local representative.
CONVERSION PROCEDURE FOR EXTERNAL PILOT

Internal/External Pilot Conversion – Valves are field convertible to an external pilot supply for applications where pressure supplied to the valve inlet is lower than the specified service limitations, including vacuum or dual pressure service and applications using sandwich regulators.

VALVES WITH BLACK COVERS

1) Remove two recessed Phillips-head screws securing valve cover.
2) Lift cover off valve.
3) Remove the rubber selector and reposition with the number “2” aligned with the pointer on the valve body.
4) Replace cover on valve and tighten screws to 10 – 12 in.-lbs.
5) Connect pressure signal (between 35 and maximum psig) to port “X”, “12”, or “14” on valve body or base. (This step is not necessary when converting valve for use with sandwich regulators).

VALVE WITH LIGHT GREY COVERS

1) Loosen two recessed Phillips-head screws securing valve cover.
2) Loosen selector by lightly tapping on cover with plastic mallet.
3) Turn selector to align with number “2” on valve body.
4) Tighten screws to 20 in.-lbs.
5) Same as Step 5 above.

MANUAL OVERRIDE CONVERSION

The following override assemblies are interchangeable and can be field converted:

Locking override…………………………………….K152008
Flush non-locking override……………………….K162005
Push-button non-locking override………………….K162006

1) Remove the override assembly by removing the two Phillips-head screws.
2) Remove the two seals in the override bore and replace with the two small o-rings supplied with the kit. Place the round gasket with the u-shaped protrusion back into place (if it becomes dislodged).
3) Install the new override assembly re-using the two Phillips-head screws. (For locking overrides, install unit with the slot vertical so that only 90 degrees of clockwise rotation is possible.)

NOTE: Non-locking overrides are held out by air pressure and may not extend until pressure is reapplied to the valve.
**Solenoid Pilot Service**

1. Remove hex nut (A) and cover (B). Slide coil and frame assembly (C) off of plunger guide (D). Unscrew the plunger guide and remove plunger (E), spring (F) and o-ring (G).
2. Clean plunger guide, plunger, spring and seat in housing. Replace plunger guide assembly if necessary.
3. Grease o-ring and place at bottom of threaded bore. Very lightly grease plunger. Reassemble plunger and spring into plunger guide. Screw plunger guide into housing and torque to 50-60 in.-lbs.
4. Slide coil and frame assembly back onto plunger guide. Gently pack wires under cover while reassembling on top of end housing (be careful not to pinch wires under edge of cover).
5. Screw hex nut onto plunger guide and torque to 30-40 in.-lbs.

**Coil / Indicator Light Replacement – Conduit Style Valves**

1. Disconnect solenoid leads from machine wiring. Remove conduit from conduit port in cover (if necessary).
2. Remove hex nut (A) and cover (B). Slide coil and frame assembly (C) off of plunger guide (D). Remove frame and washer (H) from coil. Discard coil.
3. On units with indicator light, snap open splice connectors (J) and pry clip out of splice. Slide wires out of splice. If replacing indicator light (K), crush lens. Pull out light and discard. Slide new light into housing and slide clip over indicator light until firmly contacting housing. Slide one coil and one indicator light wire into each splice. If multi-colored wires are present, connect red to red and back to white. Place clip into splice and press until flush with top of splice. Snap splice housing shut.
4. Reassemble in reverse order of disassembly. Torque hex nut to 30-40 in.-lbs.

**Coil / Indicator Light Replacement – Plug-In Valves (Model numbers NOT ending with “B”)**

1. Remove the two socket head screws from solenoid end section and detach.
2. Remove hex nut (A) and cover (B). Slide coil and frame assembly (C) off of plunger guide (D). Remove frame and washer (H) from coil.
3. Using Amp Tool No. 305183-R, disengage pins from plastic housing. Disengage locking tab on top of plastic housing and remove from end section. Pull wires out of end section.
4. On units with indicator lights, see Step 3 for Coil/Indicator Light Replacement – Conduit Style Valves above.
5. Slide solenoid wires through top of housing and out end. Slide plug housing over ends of wires (red wire on top if applicable) until pins click into housing. Slide plastic housing into end section until secured by locking tab.
6. Reassemble in reverse order of assembly. Ascertain that leads are not in a position to be pinched by cover. Tighten hex nut to 30-40 in.-lbs.

**Coil Replacement Chart**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>19&quot; Leads</th>
<th>Plug-In Light</th>
<th>Plug-In w/o Light</th>
<th>Plug-In w/ Light</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Hz</td>
<td>50 Hz</td>
<td>D.C.</td>
<td></td>
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<td>110</td>
<td>—</td>
<td>K593325</td>
<td>K593327</td>
</tr>
</tbody>
</table>

*For use with valve model numbers not ending with “B”.
** For use with valve model numbers ending with “B”.
*** Low watt.
**** Low watt with arc suppression.
<> Arc suppression.
For voltages and options not listed, consult your local representative.

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APPLICATION LIMITS
These products are intended for use in general purpose compressed air systems only. Compliance with the rated pressure, temperature and voltage is necessary -- see installation instructions packed with (or label on) valve.

VALVE MOUNTING PROCEDURES
1) Clean top surface of manifold and bottom surface of valve body of any dirt or dust.
2) Apply a light coating of grease to gasket (packet in kit) and assemble to valve body.
3) Place valve on top of manifold lining up all three mounting holes.
4) Insert (3) valve mounting screws and torque to 35-40 in-lbs in progressive steps with a crisscross pattern.

WIRING INSTRUCTIONS
Units with flying leads:

Single Solenoid: Use wires marked “2” and “3” for connection to the solenoid. Either may be “Hot”.

Double Solenoid: Use wires marked “1” and “2” for Solenoid “12”. Either may be “Hot”. Use wires marked “3” and “4” for Solenoid “14”. Either may be “Hot”.

CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 2 for single solenoid valves and wire numbers 1 and 4 for double solenoid valves as positive.

CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold and connect a ground lead to the green ground screw.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

MANIFOLD APPLICATION
Valves may be gang manifolded up to any number of stations, providing that sufficient pressure is realized in the circuits downstream of the valve outlets; and sufficient pressure is available for shifting the valves. Longer manifold gangs may require intermediate supports. Means to increase pressure levels include supply connections at both ends of the manifold gang, supplementary supply at intermediate inlets, external pilot supplies and sequencing the valve operation to maximize time between different valve shifts.

WARNING: Air exhausting from one valve into the exhaust gallery of the manifold may pressure other valve circuits open to the same gallery. Design the circuit such that there is no hazard or damage consequence from this action.

PORT CONNECTIONS
1) Connect a single inlet air supply to manifold inlet gallery by one of the following methods:
   a) All valves to be supplied with a common pressure:
      Connect air supply to port marked “1” on either end of manifold package and plug port on other end marked “1” (or connect air supply to both ends for applications requiring a larger volume of air).
   b) Two groups of valves each requiring a different single pressure supply: Isolate valves into two groups using Manifold Isolation Procedures. Connect appropriate air supply to each end of manifold package at port “1”.

   NOTE: For dual pressure applications (two inlet air supplies to either end of the bank, or an isolated zone within a bank) connect supply to ports “3” and “5”.

2) Connect mufflers (or pipe exhaust) at ports “3” and “5” for single exhaust; and port “1” for dual supply.

3) Connect cylinder ports marked “2” and “4” to ends of cylinder or other device to be supplied air. Connections are commonly made to ports on end of manifold opposite wiring cavity. If bottom ports are more accessible to your application, plug end cylinder ports and remove plugs from bottom ports.

EXTERNAL PILOT CONNECTIONS
Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

1) Perform pilot supply conversion outlined on Installation Instructions packed with valve.
EXTERNAL PILOT CONNECTIONS (continued)

2) Isolate external pilot supply gallery (designated by “X”) to those valves requiring external pilot supply.
3) Connect pilot supply source to manifold pilot supply gallery by one of the following methods:
   a) All valves to be Externally Piloted: Connect pilot supply source to port “X” in one of the port plates. Plug port “X” on opposite plate.
   b) Valves on one end of a bank to be Externally Piloted: Connect pilot supply source to port “X” on the end to be externally piloted.
   c) Valves in central portion of a bank to be Externally Piloted: Remove pipe plug from any end port marked “12” or “14” in the isolated portion of the manifold package and connect to pilot supply source.

MANIFOLDING ASSEMBLY PROCEDURES
(See Figure A)

Manifolds may be assembled to one another either before or after assembling valves to manifolds. If inlet, exhaust or external pilot galleries are to be isolated from neighboring manifolds, follow isolation procedures before proceeding with this section.

1) Line up manifolds in order of assembly while viewing cylinder ports “2” and “4”. From the port plate kit, place the right port plate (A) - stamped K568-052 - at the right end of the bank.
2) Apply a light coating of grease to a gasket (packet in kit) and place in groove in first manifold from right.
3) Assemble first manifold to right port plate (A) with two short button head screws (B). Allen wrench may be inserted through the adjacent manifold mounting hole for tightening (C). Torque screws to 40 in-lb.

CAUTION: Verify that the gasket has not been pinched out of its track before moving on to the next station.

4) Assemble remaining manifolds by repeating steps 2 and 3.
5) Apply a light coating of grease to a gasket (packet in kit) and place in groove in left port plate (E).
6) Assemble left port plate (E) to last manifold with two long button head screws (F) with lockwashers. Torque screws to 40 in-lbs.
7) Mount valves on manifolds per Valve Mounting Procedures (if not already attached).
8) Apply air pressure to the assembly and check for leaks and proper operation.

MANIFOLD ISOLATION PROCEDURES
(See Figure B)

Inlet, exhaust and external pilot galleries may be isolated from those in neighboring manifolds through the use of isolation disks/plugs.

1) Determine which gallery is to be isolated between two manifolds.
2) Modify the manifold interface gasket by cutting out the circular seal portion of the gasket around the gallery to be isolated.
3) Apply a light coating of grease (packet in kit) to isolation disk/plug and insert into counterbore.
4) Apply a light coating of grease (packet in kit) to modified gasket and assemble in manifold groove.

NOTE: When port 1 is isolated, valves on lower pressure side disc must be converted to external pilot supply (position 2 on the selector). The pilot air on these valves is provided by the inlet signal on the high pressure side of the disc, providing that one of the valves out that side is set to internal pilot supply (position 1 on the selector).

OPTIONAL ACCESSORIES

MANIFOLD AUXILIARY PORT BASE - may be used to provide a supplementary/different supply pressure and/or external pilot supply pressure to a group of valves isolated in the central portion of the bank of manifolds. Assembly and isolation procedures are the same as those for manifold blocks with the exception that there is no wiring to be done or valves to be attached to these stations.

Air connections are the same as on port plates. Ports 1, 3, and 5 are provided on both top and bottom of block. Port “X” is located on the bottom.

BLANK STATION PLATE - used with a manifold block to reserve a place for a valve that will be later added to the manifold bank or to remove a valve from a manifold without having to remove the manifold block from the manifold bank.

Place gasket and block on manifold and assemble using screws provided with plate. Tighten screws to 40 in-lbs max.

WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE INSTRUCTION MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.
WARNING

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer’s specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on service instructions sheets.
- Installation, service and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

APPLICATION LIMITS

These products are intended for use in general purpose compressed air systems only.

Operating pressure range:  PSIG   Bar   kPa
Minimum 35 2.41 241
Maximum (Standard) 150 10.34 1034
(10 Watt) 100 6.89 689

Operating Temperature Range: 20°F (-6°C) to 140°F (60°C)
Voltage Range: +10% to -15% of rating (Applicable only for solenoid operated valves)

NOTE: The above ratings are those of the associated valve.

WIRING INSTRUCTIONS

Units with flying leads:

Single Solenoid: Use wires marked “2” and “3” for connection to the solenoid. Either may be “Hot”.

Double Solenoid: Use wires marked “1” and “2” for Solenoid “12”. Either may be “Hot”. Use wires marked “3” and “4” for Solenoid “14”. Either may be “Hot”.

CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 2 for single solenoid valves and wire numbers 1 and 4 for double solenoid valves as positive.

CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold or subbase and connect a ground lead to the ground screw.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

VALVE MOUNTING PROCEDURES

1) Clean top surface of subbase and bottom surface of valve body of any dirt or dust.
2) Apply a light coating of grease to gasket (packet in kit) and assemble to valve body.
3) Place valve on top of subbase lining up all three mounting holes.
4) Insert (3) valve mounting screws and torque to 35-40 in-lbs in progressive steps with a crisscross pattern.

PORT CONNECTIONS

1) Connect a single inlet air supply to port “1”. (For dual pressure applications connect inlet air supplies to port “3” and “5”).
2) Connect mufflers (or plumb exhaust) from ports “3” and “5” for single air supply. (For dual pressure applications connect to port “1”).
3) Connect cylinder ports “2” and “4” to ends of cylinder or other device to be supplied air.

EXTERNAL PILOT SUPPLY CONNECTIONS

Use an external pilot for dual inlet air supplies, for inlet pressure below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

1) Perform pilot supply conversion outlined on installation instructions packed with valve.
2) Connect pilot supply source to the following port(s):

   Single Solenoid Valves  “14”
   Double Solenoid Valves “12” and “14”

Pin numbers as viewing face of male receptacle.

<table>
<thead>
<tr>
<th>Pin No</th>
<th>3-pin</th>
<th>4-pin Ford</th>
<th>5-pin Ford</th>
<th>4-pin Chrysler</th>
<th>5-pin Chrysler</th>
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<tbody>
<tr>
<td>1</td>
<td>Ground</td>
<td>Not used</td>
<td>Sol 14 (+)</td>
<td>Sol 12 (+)</td>
<td>Sol 12 (+)</td>
</tr>
<tr>
<td>2</td>
<td>Sol (+)</td>
<td>Sol 12 (+)</td>
<td>Sol 12 (+)</td>
<td>Ground</td>
<td>Sol 12 (+)</td>
</tr>
<tr>
<td>3</td>
<td>Sol (-)</td>
<td>Common (+)</td>
<td>Ground ($1$)</td>
<td>Common (+)</td>
<td>Ground ($1$)</td>
</tr>
<tr>
<td>4</td>
<td>Sol 14 (+)</td>
<td>-</td>
<td>Sol 12 (+)</td>
<td>Sol 14 (-)</td>
<td>Sol 14 (-)</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Sol 14 (+)</td>
<td>Sol 14 (+)</td>
</tr>
</tbody>
</table>

Note: Solenoid 14 is wired for single solenoid valves.
WARNING

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APPLICATION LIMITS

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<table>
<thead>
<tr>
<th>Operating Pressure Range:</th>
<th>PSIG</th>
<th>Bar</th>
<th>kPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>35</td>
<td>2.4</td>
<td>241</td>
</tr>
<tr>
<td>Maximum</td>
<td>150</td>
<td>10.4</td>
<td>1034</td>
</tr>
</tbody>
</table>

Operating Temperature Range: 20°F (-7°C) to 140°F (60°C)

Voltage Range: +10% to -15% of Valve Rating

(Applicable only for solenoid operated valves)

NOTE: The above ratings are those of the associated valve.

INSTALLATION

1) Remove the valve from the subbase or manifold (if assembled) by removing and discarding the three mounting screws.
2) Clean all mating surfaces of valve, subbase or manifold and Flow Control "Sandwich" of dust and dirt.
3) Apply a light coating of grease (in kit) to gasket and place in gasket track on bottom of Flow Control "Sandwich".
4) Place Flow Control "Sandwich" on top of subbase or manifold lining up all three mounting holes. Electrically operated valves also require pressing down on flow control to seat electrical plug.
5) Apply a light coating of grease (in kit) to valve gasket and place in gasket track on bottom of valve.
6) Place valve on top of Flow Control "Sandwich" lining up all three mounting holes. Electrically operated valves also require pressing down on valve to seat electrical plug.
7) Assemble valve, flow control and subbase or manifold together with (3) 1/4-20 screws. Tighten to 35-40 in-lbs. (If valve has a black plastic cover use the (3) 1/4-20 socket head cap screws. If valve has a gray metal cover use (3) 1/4-20 button head screws, P/N H09829. Part number H09829 must be ordered separately).
8) Apply pressure to subbase or manifold and check for leakage at gasket interfaces. If audible leakage or noticeable bubbling (using soapy water at joints) is present the gasket probably was accidentally pushed out of the groove during assembly. If this occurs remove pressure, disassemble and replace gasket.

ADJUSTMENT PROCEDURES

Adjustment screw nearest to junction box cover on subbase or manifold controls the flow of air from cylinder port 4 to exhaust port 5. With a double solenoid valve this occurs when operator #12 is actuated. With a single solenoid valve this occurs when operator #14 is not actuated. Adjustment screw on other end controls air from cylinder port 2 to exhaust port 3.

1) Turn both adjustment screws clockwise until fully closed and then counterclockwise slightly.
2) While cycling valve with cylinder adjust clockwise to decrease speed or counterclockwise to increase speed.

ANSI SYMBOL

![ANSI Symbol Diagram]
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- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

INSTALLATION/OPERATING INSTRUCTIONS

A sandwich regulator is used to provide regulated pressure to individual valves in a manifolded valve arrangement. Three basic modes of regulation are available as follows:

Common Port Regulation - Provides adjustable regulated air pressure to the valve inlet.

Independent Port Regulation - Provides (2) separately adjustable regulated air pressures, one to each of the valves exhaust passages. The valves exhaust (coming out of its inlet passage) is directed to both manifold or subbase exhaust ports.

Single Port Regulation - Provides adjustable regulated air pressure to one of the valves exhaust passages and full inlet pressure to the other. The valves exhaust (coming out of its inlet passage) is directed to the manifold or subbase exhaust port on the regulator end.

CAUTION: The reverse valve porting utilized with Independent Port and Single Port Regulation will reverse the function of 4-way, 3-position cylinder to exhaust and 4-way, 3-position inlet to cylinder valves. Utilize the opposite function valve for normal operation.

Sandwich regulator should be installed with reasonable accessibility for service whenever possible -- repair service kits are available. Keep pipe or tubing lengths to a minimum with inside clean and free of dirt and chips. Pipe joint compound should be used sparingly and applied only to the male pipe -- never into the female port. Do not use PTFE tape to seal pipe joints -- pieces have a tendency to break off and lodge inside the unit, possibly causing malfunction. Care must be taken to avoid undue strain on the valve. Mounting bolt torque 40-50 in-lbs.

Air applied to the sandwich regulator must be filtered to realize maximum component life.

Factory Pre-Lubrication - Sandwich regulators are pre-lubricated at assembly with Texaco Marfak MP-2 grease.

CAUTION: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additive.

APPLICATION LIMITS

These products are intended for use in general purpose compressed air systems only.

Operating pressure range:  
<table>
<thead>
<tr>
<th></th>
<th>PSIG</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>35</td>
<td>2.41</td>
<td>241</td>
</tr>
<tr>
<td>Maximum</td>
<td>150</td>
<td>10.34</td>
<td>1034</td>
</tr>
</tbody>
</table>

Operating Temperature Range: 20°F (-6°C) to 140°F (60°C)

Voltage Range: +10% to -15% of rating (Applicable only for solenoid operated valves)

NOTE: The above ratings are those of the associated valve.

WIRING INSTRUCTIONS

Units with flying leads:

Single Solenoid: Use wires marked "2" and "3" for connection to the solenoid. Either may be "Hot".

Double Solenoid: Use wires marked "1" and "2" for Solenoid "12". Either may be "Hot". Use wires marked "3" and "4" for Solenoid "14". Either may be "Hot".

CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 2 for single solenoid valves and wire numbers 1 and 4 for double solenoid valves as positive.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold or subbase and connect a ground lead to the ground ground screw.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

Units with 3-pin, 4-pin, or 5-pin connectors:

See Installation Instructions packed with or decal on subbase or manifold.

INSTALLATION

If valve is not mounted to base skip steps 1 and 2.

1) Remove (3) body to base mounting bolts and lift valve body from subbase or manifold and retain body to base seal.
2) Thoroughly clean both valve body and base mounting surfaces of all foreign residue.
3) Verify that the valve selector is properly set for use with a sandwich regulator per the Selector Settings Table as follows:

a) VALVES WITH BLACK COVERS
   1. Remove (2) recessed phillips-head screws securing valve cover.
   2. Lift cover off valve.
   3. Remove the rubber selector and reposition it with the Position Number from the Selector Settings Table aligned with the pointer on the valve body.
   4. Replace cover on valve and tighten screws to 10-12 in-lbs.

b) VALVES WITH LIGHT GREY COVERS
   1. Loosen (2) recessed phillips-head screws securing valve cover.
   2. Loosen selector by lightly tapping on cover with plastic mallet.
   3. Turn selector so that its arrow is aligned with the Position Number from the Selector Settings Table.
   4. Tighten screws to 20 in-lbs.
4) Install seal (Item #15) into the grooves on the bottom surface of the Sandwich Regulator.
INSTALLATION (CONTINUED)

5) Proceed as follows depending on the type of plug arrangement:
   a) **Sandwich Regulators with bridge plug** ("B" or "F" suffix in part number) simply align mating plug of regulator assembly to that of the base and press down.
   b) **Sandwich Regulators with plug/wire harness** ("E", "G", or "L" suffix or no suffix in part number), remove the existing plug/wire harness in the valve base. Snake the wires from the Sandwich Regulator through the empty plug opening out the conduit opening in the valve base.
6) Using the (3) new mounting bolts (Item #14), secure the Sandwich Regulator to the base torquing the bolts to 40 in-lbs.
7) Using the (3) existing mounting bolts, secure the valve to the Sandwich Regulator base torquing the bolts to 40 in-lbs.

**Selector Settings Table**

<table>
<thead>
<tr>
<th>Position Number</th>
<th>Valve Operator Type</th>
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<tbody>
<tr>
<td>2</td>
<td>Single and Double Solenoid</td>
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<tr>
<td>4*</td>
<td>Single Remote Pilot</td>
</tr>
<tr>
<td>4</td>
<td>Double Remote Pilot</td>
</tr>
</tbody>
</table>

* Provide external pilot supply of 35 to 150 psig to the valve through manifold port 12.

**CAUTION:** Valve pilot supply selector must be reset per the above table since these settings differ from those used for a valve without a sandwich regulator. Valves may fail to function properly if this procedure is not followed. Selector position number 2 provides internal pilot supply for single and double solenoid operated valves. If external pilot supply is required (main supply pressure is less than 35 psig) use a sandwich regulator drilled for external pilot supply (E, F, or G in the 10th digit of the model number).

**ANSI DIAGRAMS**

**COMMON PORT**

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**INDEPENDENT PORT**

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**SINGLE PORT**

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**VALVE SIDE**

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**PORT 5 REGULATED**

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**PORT 3 REGULATED**

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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**OPERATION**

1) Supply air to the manifold inlet gallery or subbase inlet port.
2) Disengage locking knob by pulling outward.
3) To increase pressure supplied to the valve turn locking knob clockwise until desired pressure is reached.
4) To decrease pressure supplied to the valve turn locking knob counterclockwise past the desired pressure setting and then slowly turn the knob clockwise until the desired pressure setting is reached.
5) Press the locking knob inward to secure the adjustment.
6) Adjustment may require resetting to compensate for flow after the valve is cycling in normal use.

**REPLACEMENT PARTS**

**Service Kit . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . PS460BP**

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
<th>COMMON PORT</th>
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<th>SINGLE PORT</th>
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<td>1</td>
<td>Interface Block</td>
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<td>Regulator Housing</td>
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<td>Gasket</td>
<td>Kit</td>
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<td>Poppet Assembly</td>
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<td>12A</td>
<td>Wire Assembly, 18&quot;</td>
<td>K512006</td>
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<td>12B</td>
<td>Wire Assembly, 6&quot;</td>
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<td>13</td>
<td>Pin Housing</td>
<td>K203089</td>
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<td>1</td>
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<tr>
<td>14</td>
<td>Screw (Low Head SHCS, 1/4-20 X 3/4)</td>
<td>H30901</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>Seal</td>
<td>K663006</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* For plug options "B" or "F" (Bridge plug) only. NSS - Not Sold Separately.

**WARNING**

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WARNING

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on service instructions sheets.
- Installation, service and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

Plug-In Lamp Replacement Instructions:

1) Gently pry up under light and remove. Discard light and o-ring seal.
2) Slide new o-ring over lamp body.
3) Align "+" printed on light with the "+" molded on the coil. Insert the light and press firmly to seat.

Available Lamps:

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator Lamp (120/60 AC)</td>
<td>K252009</td>
</tr>
<tr>
<td>Indicator Lamp (24V DC)</td>
<td>K252008</td>
</tr>
</tbody>
</table>

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APPLICATION LIMITS

These products are intended for use in general purpose compressed air systems only.

Operating pressure range: PSIG Bar kPa

Minimum* 35 2.41 241
Maximum (Standard) 150 10.34 1034
(Low Watt) 100 6.89 689

* For lower pressure or vacuum operation, solenoid(s) may be externally piloted (35 psig min.) following the conversion procedure on these instructions.

Operating Temperature Range: 32°F (0°C) to 175°F (80°C)

Voltage Range: ±10% to -15% of rating

Dynamic Seal Replacement Instructions (Kit No. K352423)

1) Mark end sections to ensure re-assembly on the proper end. Remove two socket head screws from each end section and detach.

Note: Valves with model numbers ending in “B” have end sections with wiring that cannot be detached. Wire length is sufficient for service access. Remove spring (where applicable).

2) Remove spool and clean. Note which end spring or spring bore in spool was on.
3) Remove molded seal from each end of body and retain.
4) Remove end spacers, spacers, seal retainers, and o-rings. Discard the inner o-rings only. Clean body and all retained parts.
5) Lightly grease the o-rings and install onto seal retainers.
6) Using the spool as a mandrel, begin reassembly by sliding a seal retainer (outside o-ring facing downward) over the spool and push down. Then stack a spacer on top of the seal retainer. Next, stack a seal retainer (outside o-ring facing upward). Repeat this process alternating seal retainer orientation each time. The final assembly should have outside o-rings showing at each end of the spool.

Note: Valves with four (4) brass and two (2) aluminum seal retainers must be reassembled with the aluminum seal retainers in the middle two (2) positions.

7) Grease the outside of this assembly and gently slide it into the valve body. (On spring return valves, the hollow end of the spool goes on the spring return end.)
8) Lightly grease end gaskets and place in grooves in ends of body.
9) Spring Return End Sections - Slide spring into bore in end of spool. Compress spring while assembling end housing to body with socket head screws. Torque screws to 30-35 in.lbs.

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INTRODUCTION

Follow these instructions when installing, operating, or servicing the product.

MANUAL OVERRIDE SERVICE/CONVERSION

Service of or Conversion to an Extended Locking Override (Kit No. K162010).

1) Remove override mounting screws (A) and retain.
2) Remove and discard override, override cover and all seals.
3) Lightly lubricate new seals with grease (tube in kit).
4) Place (2) small o-rings (B) into counterbores. Place the round gasket (C) with the u-shaped protrusion into its groove.
5) Place the override selector (D) into the housing with the slot vertical so that only 90° of clockwise rotation is possible.
6) Place o-ring (E) into top of override selector.
7) Assemble new override (F) with blade of override lined up with slot in override selector (D). Also make sure that chamfer on override knob is to the right.
8) Replace override mounting screws (A) and tighten.

Retrofitting a Standard Locking Override to an Extended Locking Override (Kit No. K112104).

1) Turn override counterclockwise to the off position.
2) Remove override mounting screws (A) and retain.
3) Remove and discard override cover.
4) Assemble new override with blade of override lined up with slot in override selector (D). Also make sure that chamfer on override knob is to the right.
5) Replace override mounting screws (A) and tighten.

WARNING

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- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on service instructions sheets.
- Installation, service and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
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APPLICATION LIMITS

These products are intended for use in general purpose compressed air systems only.

Operating pressure range:  
Minimum 35 2.41 241  
Maximum (Standard) 150 10.34 1034  
(Low Watt) 100 6.89 689  

* For lower pressure or vacuum operation, solenoid(s) may be externally piloted (35 psig min.) following the conversion procedure on these instructions.

Operating Temperature Range: 20°F (7°C) to 140°F (60°C)
Voltage Range: +10% to -15% of rating

WIRING INSTRUCTIONS

Units with flying leads:
Single Solenoid: Use wires marked “2” and “3” for connection to the solenoid. Either may be “Hot”.
Double Solenoid: Use wires marked “1” and “2” for Solenoid “12”. Either may be “Hot”. Use wires marked “3” and “4” for Solenoid “14”. Either may be “Hot”.

CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 2 for single solenoid valves and wire numbers 1 and 4 for double solenoid valves as positive.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold or subbase and connect a ground lead to the green ground screw.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

Units with 3-pin, 4-pin, or 5-pin connectors:
See Installation Instructions packed with or decal on subbase or manifold.

PLUG-IN SOLENOID CONVERSION INSTRUCTIONS

To replace one solenoid on a single-solenoid valve or both solenoids on a double-solenoid valve:
1) Remove air, electricity, etc.
2) Remove old solenoid end section(s) and discard.
3) Remove valve body cover and remove all wiring and plugs from body.
4) Insert new 4-pin plug housing in body (note orientation of plug, taller side of plug rests against wall of valve body).
5) Assemble new end section(s) to body passing lead wires into body cavity and torque screws to 40 in-lbs.
6) Insert pins on ends of lead wires into plastic plug housing until they lock in place in the location shown in the wiring diagram.
7) Replace valve cover and tighten screws to 10-12 in-lbs on black covers, and on grey covers, 20 in-lbs.

To replace one solenoid only on a double-solenoid valve:
1) Remove air, electricity, etc.
2) Remove old solenoid end section and discard.
3) Remove valve body.
4) Using pliers, pull the wires going to the solenoid to be replaced out of the 4-wire plug housing (The pins can be removed easier by using AMP tool no. 305183-R.)
5) Remove the wires and the corresponding 2-wire plug from the body and discard.
6) Assemble new end section to body passing lead wires into body cavity and torque screws to 40 in-lbs.
7) Insert pins on ends of lead wires into plastic plug housing until they lock in place in the location shown in the wiring diagram.
8) Replace valve cover and tighten screws to 10-12 in-lbs on black covers, and on grey covers, 20 in-lbs.
CONVERSION PROCEDURE FOR EXTERNAL PILOT

Internal/External Pilot Conversion - Valves are field convertible to an external pilot supply for applications where pressure supplied to the valve inlet is lower than the specified service limitations, including vacuum or dual pressure service and applications using sandwich regulators.

Valves with Black Covers
1) Remove two recessed phillip-head screws securing valve cover.
2) Lift cover off valve.
3) Remove the rubber selector and reposition with the number “2” aligned with the pointer on the valve body.
4) Replace cover on valve and tighten screws to 10-12 in-lbs.
5) Connect pressure signal (between 35 and maximum psig) to port “X”, “12” or “14” on valve body or base. (This step is not necessary when converting valve for use with sandwich regulators).

Valves with Light Grey Covers
1) Loosen two recessed phillip-head screws securing valve cover.
2) Loosen selector by lightly tapping on cover with plastic mallet.
3) Turn selector to align with number “2” on valve cover.
4) Tighten screws to 20 in-lbs.
5) Connect pressure signal (between 35 and maximum psig) to port “X”, “12” or “14” on valve body or base. (This step is not necessary when converting valve for use with sandwich regulators).

Pilot Selector Code

<table>
<thead>
<tr>
<th>Position</th>
<th>Operator Type</th>
<th>Pilot Supply</th>
<th>Sandwich Regulator</th>
<th>Port 12</th>
<th>Port 14</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Solenoid</td>
<td>Internal</td>
<td>No</td>
<td>Plug</td>
<td>Plug</td>
</tr>
<tr>
<td>2</td>
<td>Solenoid</td>
<td>External</td>
<td>No</td>
<td>Plug*</td>
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</tr>
<tr>
<td>3</td>
<td>Single</td>
<td>N/A</td>
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<td>Plug</td>
<td>Pilot</td>
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<tr>
<td>4</td>
<td>Double</td>
<td>N/A</td>
<td>No</td>
<td>Pilot</td>
<td>Signal</td>
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<tr>
<td>2</td>
<td>Solenoid</td>
<td>Internal</td>
<td>Yes</td>
<td>Plug</td>
<td>Plug</td>
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<tr>
<td>2</td>
<td>Solenoid</td>
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<td>Yes</td>
<td>Plug</td>
<td>*</td>
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<tr>
<td>4</td>
<td>Single</td>
<td>N/A</td>
<td>Yes</td>
<td>**</td>
<td>Pilot</td>
</tr>
<tr>
<td>4</td>
<td>Double</td>
<td>N/A</td>
<td>Yes</td>
<td>Pilot</td>
<td>Signal</td>
</tr>
</tbody>
</table>

* Supply 35 - 150 PSIG (35 - 100 PSIG for low watt) (or at port “X” if applicable).
** Supply 35 - 150 PSIG (35 - 100 PSIG for low watt).

Available Service Items

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
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<tbody>
<tr>
<td>Seal Kit</td>
<td>K352386</td>
</tr>
<tr>
<td>Locking Override</td>
<td>K152008</td>
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<tr>
<td>Flush Non-Locking Override</td>
<td>K162005</td>
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<tr>
<td>Ext. Non-Locking Override</td>
<td>K162006</td>
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<tr>
<td>Indicator Lamp (120/60 AC)*</td>
<td>H19109</td>
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<tr>
<td>Indicator Lamp (24V DC)*</td>
<td>H19110</td>
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<tr>
<td>Indicator Lamp (120/60 AC)**</td>
<td>K252009</td>
</tr>
<tr>
<td>Indicator Lamp (24V DC)**</td>
<td>K252008</td>
</tr>
<tr>
<td>Plunger &amp; Guide (Standard)</td>
<td>K232025</td>
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<tr>
<td>Plunger &amp; Guide (Low Watt)</td>
<td>K232047</td>
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<tr>
<td>Return Spring</td>
<td>K473053</td>
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<tr>
<td>Interface Seal</td>
<td>K663006</td>
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</table>

Coil Replacement Chart

<table>
<thead>
<tr>
<th>Voltage</th>
<th>D.C. 19” Leads</th>
<th>Plug-In*</th>
<th>Plug-In w/o Light**</th>
<th>Plug-In w/Light**</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Hz</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>50 Hz</td>
<td></td>
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<tr>
<td>24</td>
<td>–</td>
<td>K593169</td>
<td>K593211</td>
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<td>–</td>
<td>–</td>
<td>K593170</td>
<td>K593213</td>
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<tr>
<td>–</td>
<td>–</td>
<td>K593171</td>
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<td>–</td>
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<td>K593281</td>
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<td>K593315</td>
<td>K593328</td>
<td>K593330</td>
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<tr>
<td>120</td>
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<td>K593205</td>
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<td>240</td>
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<td>–</td>
<td>K593325</td>
<td>K593331</td>
<td>K593333</td>
</tr>
</tbody>
</table>

* For use with valve model numbers not ending with “B”.
** For use with valve model numbers ending with “B”.
† Low watt.
†† Low watt with arc suppression.
<> Arc suppression.
For voltages and options not listed, consult your local representative.

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