

**Series
27, 21 and 16
Poppet Valves
for Line Mounting
and
Valves for Vacuum Service**



• *Manufacturers of Premium Pneumatic Controls since 1921* •



Consider it **DONE!**

Contents

| | |
|---|--------|
| Features of ROSS Line-Mount Valves | 2 |
| Series 27 Poppet Valves for Line Mounting | 3 |
| Features | |
| Series 27 Poppet Valves for Line Mounting | |
| Single Solenoid Pilot Controlled..... | 4 |
| Single Pressure Controlled | 5 |
| Double Direct Solenoid Controlled, Detented | 6 |
| Indicator Light Kit | 6 |
| Manual Override Kits | 6 |
| Series 21 Poppet Valves for Line Mounting | 7 |
| Series 21 Poppet Valves for Line Mounting | |
| Single Solenoid Pilot Controlled..... | 8 |
| Single Pressure Controlled | 9 |
| Double Direct Solenoid Controlled, Detented | 10 |
| What are Vacuum Service Valves? | 10 |
| Anatomy of a Vacuum Service Valve | 11 |
| Why a ROSS Vacuum Valve? | 11 |
| Series 21 Solenoid Pilot Controlled Vacuum Valves | 12 |
| Series 21 Pressure Controlled Vacuum Valves | 13 |
| Series 21 Solenoid Pilot Controlled Full Vacuum Valves | 14 |
| Series 16 Compact Poppet Valves, Line or Manifold Mounting | 14, 15 |
| CAUTIONS | 15 |
| WARRANTY | 15 |
| Global Locations | 16 |

If you need products or specifications not shown within this bulletin, please contact ROSS for more information or visit ROSS website at www.rosscontrols.com.

Features of ROSS Line-Mount Valves

1. Low weight; compact size.
2. **LOGICAIR**® adaptors provide special functions:
 - Timed sequence actuation and/or deactuation
 - Momentary control of actuation/deactuation from one pressure source
 - Actuating force multiplier, for use with low signal pressures.
3. Available with choices of internal components for three different temperature ranges.
4. Choose from five flow patterns: 2/2 normally-open/-closed, 3/2 normally-open/closed, or 4/2 designs.
5. Port sizes up to 2½"; C_v ratings up to 70.
6. Can be mounted close to actuator, reducing length of pipe to be pressurized/exhausted on each cycle.
7. Long life expectancy.
8. Consistent response times over the life of the valve.



Series 27 Poppet Valves for Line Mounting

Series 27 Poppet valves for line mounting are available with single or double solenoid pilot control, or an air head for pressure control. Valve elements have end-guided stainless steel stems. Flush flexible manual override buttons are standard on solenoid models. Solenoid models listed in this catalog use an internal pilot supply. They are, however, easily field-convertible for use with an external pilot supply. Models for external pilot supply may also be ordered from ROSS.

FEATURES:

- Poppet construction for near zero leakage & high dirt tolerance
- Self-cleaning
- Wear compensating
- Repeatability throughout the life of the valve

To provide special control functions, most models are also available with the following **LOGICAIR®** adaptors.

Timed Sequence Adaptor: Allows the actuation and/or de-actuation of a valve to be delayed up to 30 seconds for 2/2 valves, and up to 3 seconds for 3/2 and 4/2 valves. For longer delays see “Q” adaptor below.

“PB” Adaptor: Increases the actuating force on the valve piston. Useful with low pilot pressure.

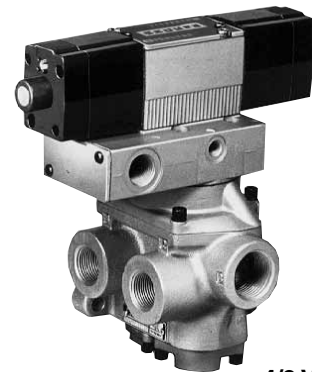
Air Index Adaptor: Allows a single control valve to function as an impulse controlled, detented valve. Successive momentary signals from the same source actuate and de-actuate the valve.

“Q” Adaptor: For use in conjunction with the timed sequence adaptor to extend the delay interval up to 60 seconds. The “Q” adaptor also provides quicker response to actuating and de-actuating signals.

For additional information consult your ROSS distributor or call ROSS Technical Services in the U.S.A. at 1-888-TEK-ROSS (835-7677).

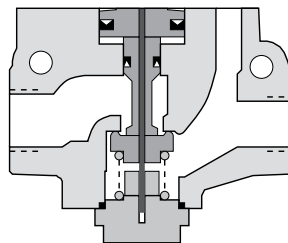


3/2 Valve with Single Solenoid Pilot Control

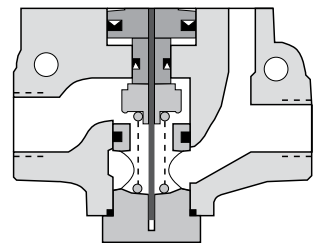


4/2 Valve with Double Solenoid Pilot Control

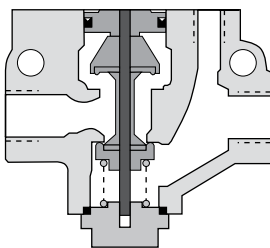
Series 27 Valve Bodies



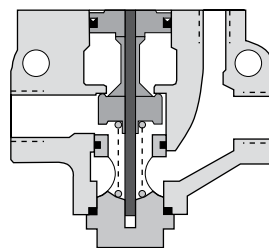
2/2 Normally Closed



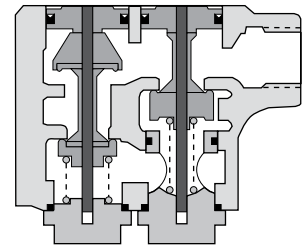
2/2 Normally Open



3/2 Normally Closed



3/2 Normally Open

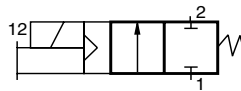


4/2

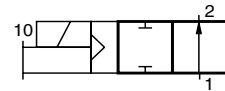
Series 27 Poppet Valves for Line Mounting

Single Solenoid Pilot Controlled

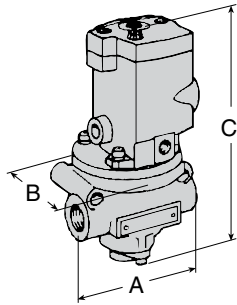
2/2 Valves



Normally Closed (NC)

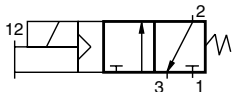


Normally Open (NO)

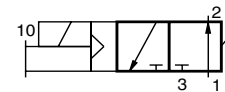


| Port Size | Valve Model Number | | Avg. C_v | | Dimensions inches (mm) | | | Weight lb (kg) |
|-----------|--------------------|-----------|------------|-----|------------------------|-----------|------------|----------------|
| | NC | NO | NC | NO | A | B | C | |
| 1/4 | 2771B2001 | 2772B2001 | 2.3 | 2.3 | 3.6 (91) | 3.2 (79) | 6.9 (175) | 2.5 (1.2) |
| 3/8 | 2771B3001 | 2772B3001 | 3.8 | 3.3 | 3.6 (91) | 3.2 (79) | 6.9 (175) | 2.5 (1.2) |
| 1/2 | 2771B4011 | 2772B4011 | 4.0 | 3.5 | 3.6 (91) | 3.2 (79) | 6.9 (175) | 2.5 (1.2) |
| 1/2 | 2771B4001 | 2772B4001 | 7.7 | 6.5 | 4.6 (116) | 3.2 (79) | 7.6 (193) | 3.3 (1.5) |
| 3/4 | 2771B5001 | 2772B5001 | 9.0 | 7.3 | 4.6 (116) | 3.2 (79) | 7.6 (193) | 3.3 (1.5) |
| 1 | 2771B6011 | 2772B6011 | 9.0 | 7.9 | 4.6 (116) | 3.2 (79) | 7.6 (193) | 3.3 (1.5) |
| 1 | 2771B6001 | 2772B6001 | 24 | 21 | 6.7 (169) | 4.1 (104) | 10.4 (265) | 7.0 (3.2) |
| 1¼ | 2771B7001 | 2772B7001 | 29 | 20 | 6.7 (169) | 4.1 (104) | 10.4 (265) | 7.0 (3.2) |
| 1½ | 2771B8011 | 2772B8011 | 29 | 21 | 6.7 (169) | 4.1 (104) | 10.4 (265) | 7.0 (3.2) |
| 1½ | 2771B8001 | 2772B8001 | 49 | 49 | 8.7 (219) | 5.2 (131) | 11.8 (300) | 15.5 (6.9) |
| 2 | 2771B9001 | 2772B9001 | 57 | 57 | 8.7 (219) | 5.2 (131) | 11.8 (300) | 15.5 (6.9) |
| 2½ | 2771B9011 | 2772B9011 | 64 | 72 | 8.7 (219) | 5.2 (131) | 11.8 (300) | 15.5 (6.9) |

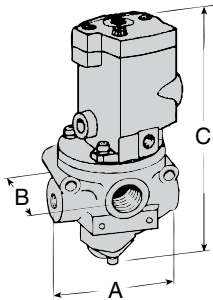
3/2 Valves



Normally Closed (NC)

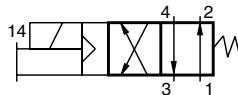
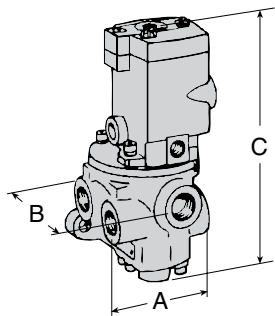


Normally Open (NO)



| Port Sizes | | Valve Model Number | | Avg. C_v | | Dimensions inches (mm) | | | Weight lb (kg) |
|------------|------|--------------------|-----------|------------|-----|------------------------|-----------|------------|----------------|
| In-Out | Exh. | NC | NO | NC | NO | A | B | C | |
| 1/4 | 1/2 | 2773B2001 | 2774B2001 | 2.8 | 2.5 | 3.6 (91) | 3.2 (79) | 7.2 (182) | 2.5 (1.2) |
| 3/8 | 1/2 | 2773B3001 | 2774B3001 | 4.0 | 3.0 | 3.6 (91) | 3.2 (79) | 7.2 (182) | 2.5 (1.2) |
| 1/2 | 1/2 | 2773B4011 | 2774B4011 | 3.8 | 3.0 | 3.6 (91) | 3.2 (79) | 7.2 (182) | 2.5 (1.2) |
| 1/2 | 1 | 2773B4001 | 2774B4001 | 7.8 | 7.2 | 4.6 (116) | 3.6 (92) | 7.9 (201) | 3.3 (1.5) |
| 3/4 | 1 | 2773B5001 | 2774B5001 | 9.4 | 7.2 | 4.6 (116) | 3.6 (92) | 7.9 (201) | 3.3 (1.5) |
| 1 | 1 | 2773B6011 | 2774B6011 | 10 | 7.2 | 4.6 (116) | 3.6 (92) | 7.9 (201) | 3.3 (1.5) |
| 1 | 1½ | 2773B6001 | 2774B6001 | 29 | 21 | 6.7 (169) | 4.9 (123) | 10.4 (265) | 7.0 (3.2) |
| 1¼ | 1½ | 2773B7001 | 2774B7001 | 31 | 22 | 6.7 (169) | 4.9 (123) | 10.4 (265) | 7.0 (3.2) |
| 1½ | 1½ | 2773B8011 | 2774B8011 | 31 | 21 | 6.7 (169) | 4.9 (123) | 10.4 (265) | 7.0 (3.2) |
| 1½ | 2½ | 2773B8001 | 2774B8001 | 69 | 58 | 8.7 (219) | 6.4 (161) | 12.4 (313) | 16.5 (7.4) |
| 2 | 2½ | 2773B9001 | 2774B9001 | 70 | 60 | 8.7 (219) | 6.4 (161) | 12.4 (313) | 16.5 (7.4) |
| 2½ | 2½ | 2773B9011 | 2774B9011 | 71 | 55 | 8.7 (219) | 6.4 (161) | 12.4 (313) | 16.5 (7.4) |

4/2 Valves



| Port Sizes | | Valve Model Number | Avg. C_v | Dimensions inches (mm) | | | Weight lb (kg) |
|------------|------|--------------------|------------|------------------------|-----------|------------|----------------|
| In-Out | Exh. | Number | C_v | A | B | C | |
| 1/4 | 1/2 | 2776B2001 | 2.5 | 4.0 (100) | 3.9 (97) | 7.2 (182) | 3.0 (1.4) |
| 3/8 | 1/2 | 2776B3001 | 3.6 | 4.0 (100) | 3.9 (97) | 7.2 (182) | 3.0 (1.4) |
| 1/2 | 1/2 | 2776B4011 | 3.7 | 4.0 (100) | 3.9 (97) | 7.2 (182) | 3.0 (1.4) |
| 1/2 | 1 | 2776B4001 | 6.9 | 4.7 (118) | 5.3 (135) | 9.0 (228) | 5.3 (2.4) |
| 3/4 | 1 | 2776B5001 | 8.2 | 4.7 (118) | 5.3 (135) | 9.0 (228) | 5.3 (2.4) |
| 1 | 1 | 2776B6011 | 8.9 | 4.7 (118) | 5.3 (135) | 9.0 (228) | 5.3 (2.4) |
| 1 | 1½ | 2776B6001 | 23 | 6.5 (166) | 8.3 (211) | 10.7 (271) | 11.3 (5.1) |
| 1¼ | 1½ | 2776B7001 | 24 | 6.5 (166) | 8.3 (211) | 10.7 (271) | 11.3 (5.1) |
| 1½ | 1½ | 2776B8011 | 25 | 6.5 (166) | 8.3 (211) | 10.7 (271) | 11.3 (5.1) |

STANDARD SPECIFICATIONS: For valves on this page.

Solenoids: AC or DC power.

Standard Voltages: Consult ROSS.

Power Consumption: 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.

Ambient Temperature: 40° to 120°F (4° to 50°C).

Media Temperature: 40° to 175°F (4° to 80°C).

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 1/4 to 1½ Port Sizes: 15 to 150 psig (1 to 10 bar);

1½ to 2½ Port Sizes: 30 to 150 psig (2 to 10 bar).

Pilot Pressure: When external supply is used, pressure must be equal to or greater than inlet pressure.

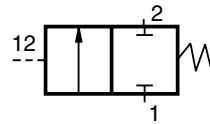
Threads: Model numbers above specify NPT pressure port threads. For other threads, consult ROSS.

IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

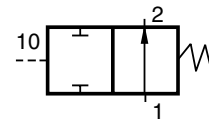
Series 27 Poppet Valves for Line Mounting

Single Pressure Controlled

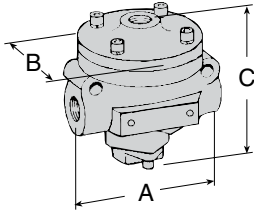
2/2 Valves



Normally Closed (NC)

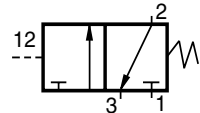


Normally Open (NO)

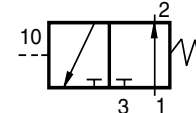


| Port Size | Valve Model Number | | Avg. C _v | | Dimensions inches (mm) | | | Weight lb (kg) |
|-----------|--------------------|-----------|---------------------|-----|------------------------|-----------|-----------|----------------|
| | NC | NO | NC | NO | A | B | C | |
| 1/4 | 2751A2001 | 2752A2001 | 2.3 | 2.3 | 3.6 (91) | 3.2 (79) | 3.8 (95) | 1.3 (0.6) |
| 3/8 | 2751A3001 | 2752A3001 | 3.8 | 3.3 | 3.6 (91) | 3.2 (79) | 3.8 (95) | 1.3 (0.6) |
| 1/2 | 2751A4011 | 2752A4011 | 4.0 | 3.5 | 3.6 (91) | 3.2 (79) | 3.8 (95) | 1.3 (0.6) |
| 1/2 | 2751A4001 | 2752A4001 | 7.7 | 6.5 | 4.6 (116) | 3.2 (79) | 4.5 (113) | 2.0 (0.9) |
| 3/4 | 2751A5001 | 2752A5001 | 9.0 | 7.3 | 4.6 (116) | 3.2 (79) | 4.5 (113) | 2.0 (0.9) |
| 1 | 2751A6011 | 2752A6011 | 9.0 | 7.9 | 4.6 (116) | 3.2 (79) | 4.5 (113) | 2.0 (0.9) |
| 1 | 2751A6001 | 2752A6001 | 24 | 21 | 6.7 (169) | 4.1 (104) | 7.5 (190) | 8.0 (3.6) |
| 1¼ | 2751A7001 | 2752A7001 | 29 | 20 | 6.7 (169) | 4.1 (104) | 7.5 (190) | 8.0 (3.6) |
| 1½ | 2751A8011 | 2752A8011 | 29 | 21 | 6.7 (169) | 4.1 (104) | 7.5 (190) | 8.0 (3.6) |
| 1½ | 2751A8001 | 2752A8001 | 49 | 49 | 8.7 (219) | 5.2 (131) | 9.0 (228) | 14.3 (6.4) |
| 2 | 2751A9001 | 2752A9001 | 57 | 57 | 8.7 (219) | 5.2 (131) | 9.0 (228) | 14.3 (6.4) |
| 2½ | 2751A9011 | 2752A9011 | 64 | 72 | 8.7 (219) | 5.2 (131) | 9.0 (228) | 14.3 (6.4) |

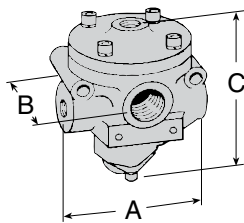
3/2 Valves



Normally Closed (NC)

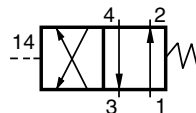
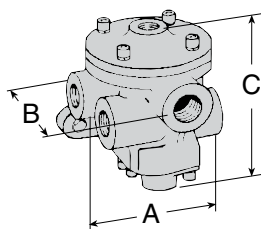


Normally Open (NO)



| Port Sizes | | Valve Model Number | | Avg. C _v | | Dimensions inches (mm) | | | Weight lb (kg) |
|------------|------|--------------------|-----------|---------------------|-----|------------------------|-----------|-----------|----------------|
| In-Out | Exh. | NC | NO | NC | NO | A | B | C | |
| 1/4 | 1/2 | 2753A2001 | 2754A2001 | 2.8 | 2.5 | 3.6 (91) | 3.2 (79) | 4.0 (101) | 1.3 (0.6) |
| 3/8 | 1/2 | 2753A3001 | 2754A3001 | 4.0 | 3.0 | 3.6 (91) | 3.2 (79) | 4.0 (101) | 1.3 (0.6) |
| 1/2 | 1/2 | 2753A4011 | 2754A4011 | 3.8 | 3.0 | 3.6 (91) | 3.2 (79) | 4.0 (101) | 1.3 (0.6) |
| 1/2 | 1 | 2753A4001 | 2754A4001 | 7.8 | 7.2 | 4.6 (116) | 3.6 (92) | 4.8 (121) | 2.0 (0.9) |
| 3/4 | 1 | 2753A5001 | 2754A5001 | 9.4 | 7.2 | 4.6 (116) | 3.6 (92) | 4.8 (121) | 2.0 (0.9) |
| 1 | 1 | 2753A6011 | 2754A6011 | 10 | 7.2 | 4.6 (116) | 3.6 (92) | 4.8 (121) | 2.0 (0.9) |
| 1 | 1½ | 2753A6001 | 2754A6001 | 29 | 21 | 6.7 (169) | 4.9 (123) | 7.5 (190) | 6.0 (2.7) |
| 1¼ | 1½ | 2753A7001 | 2754A7001 | 31 | 22 | 6.7 (169) | 4.9 (123) | 7.5 (190) | 6.0 (2.7) |
| 1½ | 1½ | 2753A8011 | 2754A8011 | 31 | 21 | 6.7 (169) | 4.9 (123) | 7.5 (190) | 6.0 (2.7) |
| 1½ | 2½ | 2753A8001 | 2754A8001 | 69 | 58 | 8.7 (219) | 6.4 (161) | 9.5 (241) | 15.3 (6.9) |
| 2 | 2½ | 2753A9001 | 2754A9001 | 70 | 60 | 8.7 (219) | 6.4 (161) | 9.5 (241) | 15.3 (6.9) |
| 2½ | 2½ | 2753A9011 | 2754A9011 | 71 | 55 | 8.7 (219) | 6.4 (161) | 9.5 (241) | 15.3 (6.9) |

4/2 Valves



| Port Sizes | | Valve Model Number | Avg. C _v | Dimensions inches (mm) | | | Weight lb (kg) |
|------------|------|--------------------|---------------------|------------------------|-----------|-----------|----------------|
| In-Out | Exh. | | | A | B | C | |
| 1/4 | 1/2 | 2756A2001 | 2.5 | 4.0 (100) | 3.9 (97) | 4.0 (101) | 1.8 (0.8) |
| 3/8 | 1/2 | 2756A3001 | 3.6 | 4.0 (100) | 3.9 (97) | 4.0 (101) | 1.8 (0.8) |
| 1/2 | 1/2 | 2756A4011 | 3.7 | 4.0 (100) | 3.9 (97) | 4.0 (101) | 1.8 (0.8) |
| 1/2 | 1 | 2756A4001 | 6.9 | 4.7 (118) | 5.3 (135) | 5.8 (147) | 4.3 (1.9) |
| 3/4 | 1 | 2756A5001 | 8.2 | 4.7 (118) | 5.3 (135) | 5.8 (147) | 4.3 (1.9) |
| 1 | 1 | 2756A6011 | 8.9 | 4.7 (118) | 5.3 (135) | 5.8 (147) | 4.3 (1.9) |
| 1 | 1½ | 2756A6001 | 23 | 6.5 (166) | 8.3 (211) | 7.5 (190) | 10.3 (4.6) |
| 1¼ | 1½ | 2756A7001 | 24 | 6.5 (166) | 8.3 (211) | 7.5 (190) | 10.3 (4.6) |
| 1½ | 1½ | 2756A8011 | 25 | 6.5 (166) | 8.3 (211) | 7.5 (190) | 10.3 (4.6) |

STANDARD SPECIFICATIONS: For valves on this page.

Ambient/Media Temperature: 40° to 175°F (4° to 80°C).

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 1/4 to 1½ Port Sizes: 15 to 150 psig (1 to 10 bar).

1½ to 2½ Port Sizes: 30 to 150 psig (2 to 10 bar).

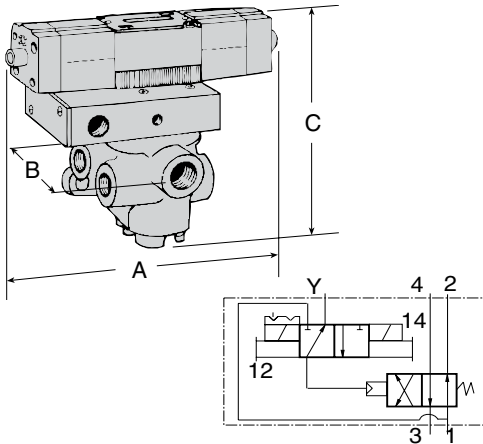
Pilot Pressure: Must be equal to or greater than inlet pressure.

Threads: Model numbers above specify NPT pressure port threads. For other threads, consult ROSS.

IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

Series 27 Poppet Valves for Line Mounting

4/2 Valves – Double Direct Solenoid Controlled, Detented



| Port Sizes In-Out | Exh. | Valve Model Number | Avg. C _v | Dimensions inches (mm) | | | Weight lb (kg) |
|----------------------|------|-----------------------|------------------------|------------------------|-----------|------------|-------------------|
| | | | | A | B | C | |
| 1/4 | 1/2 | 2776B2003 | 2.5 | 9.3 (236) | 3.9 (97) | 7.9 (201) | 4.0 (1.8) |
| 3/8 | 1/2 | 2776B3003 | 3.6 | 9.3 (236) | 3.9 (97) | 7.9 (201) | 4.0 (1.8) |
| 1/2 | 1/2 | 2776B4013 | 3.7 | 9.3 (236) | 3.9 (97) | 7.9 (201) | 4.0 (1.8) |
| 1/2 | 1 | 2776B4003 | 6.9 | 9.3 (236) | 5.3 (135) | 9.7 (246) | 6.3 (2.8) |
| 3/4 | 1 | 2776B5003 | 8.2 | 9.3 (236) | 5.3 (135) | 9.7 (246) | 6.3 (2.8) |
| 1 | 1 | 2776B6013 | 8.9 | 9.3 (236) | 5.3 (135) | 9.7 (246) | 6.3 (2.8) |
| 1 | 1½ | 2776B6003 | 23 | 9.3 (236) | 8.3 (211) | 11.6 (295) | 12.3 (5.5) |
| 1¼ | 1½ | 2776B7003 | 24 | 9.3 (236) | 8.3 (211) | 11.6 (295) | 12.3 (5.5) |
| 1½ | 1½ | 2776B8013 | 25 | 9.3 (236) | 8.3 (211) | 11.6 (295) | 12.3 (5.5) |

STANDARD SPECIFICATIONS: For valves listed above.

Solenoids: AC or DC power.

Standard Voltages: Consult ROSS.

Power Consumption: Each solenoid; 190 VA inrush, 40 VA holding on 50 or 60 Hz; 20 watts on DC.

Indicator Lights: In each solenoid housing.

Ambient Temperature: 40° to 120°F (4° to 50°C).

Media Temperature: 40° to 175°F (4° to 80°C).

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 15 to 150 psig (1 to 10 bar).

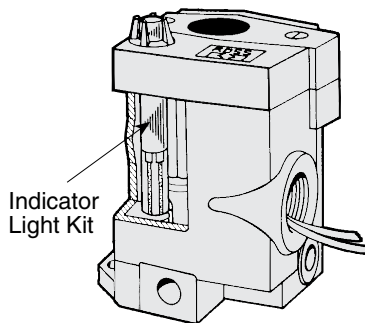
Pilot Pressure: If external supply is used, pressure must be equal to or greater than inlet pressure.

Threads: Model numbers above specify NPT pressure port threads. For other threads, consult ROSS.

IMPORTANT NOTE

Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

Indicator Light Kit



An indicator light extends through the solenoid or pilot cover and is illuminated when the solenoid is energized. Such lights are standard on double solenoid valves in Series 21 and 27.

An indicator light is available in kit form for single solenoid models in Series 16, Series 21 (type O only), and Series 27.

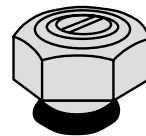
Order kit number **862K87** and specify the voltage of the solenoid.

Manual Override Kits

Flush flexible manual overrides are standard on single solenoid models in Series 16 and Series 27. Double solenoid models in Series 21 and 27 have flush metal-button overrides. Both types are non-locking.

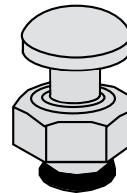
Each of the buttons in the override kits below is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.

Order by the kit numbers shown below.



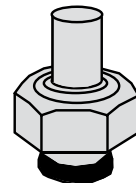
FLUSH BUTTON

Locking type Kit **792K87**
Non-locking type..... Kit **790K87**



EXTENDED BUTTON WITH PALM ACTUATOR

Non-locking type..... Kit **984H87**



EXTENDED BUTTON

Non-locking type..... Kit **791K87**

Series 21 Poppet Valves for Line Mounting

Series 21 High Temperature and Low Temperature Service

Series 21 valves are configured like the Series 27 valves, but are designed with metal internals and special seals appropriate for use in more extreme temperatures. The valves are designated as either Type H (High Temperature) or Type O (Low Temperature) valves. Temperature specifications for the two types are given below.

Solenoid models listed in this catalog use an internal pilot supply. They are, however, easily field-convertible for use with an external pilot supply. Models for external pilot supply may also be ordered from ROSS.

Type H (High Temperature) Service: Fluorocarbon seals are used to ensure high temperature stability.

Ambient Temperature: Up to 250°F (122°C) for solenoid models; up to 300°F (150°C) for pressure controlled models.

Media Temperature: 0° to 300°F (-17° to 150°C).

Type O (Low Temperature) Service: Buna-N seals are used to ensure good performance at low temperatures.

Ambient Temperature: Down to -40°F (-40°C).

Media Temperature: -40° to 175°F (-40° to 80°C).

Vacuum Service: The construction of Series 21 valves makes them readily adaptable to vacuum service.

For additional information consult your ROSS distributor or call ROSS Technical Services in the U.S.A. at 1-888-TEK-ROSS (835-7677).



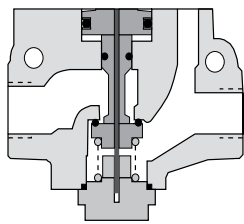
3/2 Valve with Single Solenoid Pilot
Metal override button on top of pilot is standard on all single solenoid models.

FEATURES:

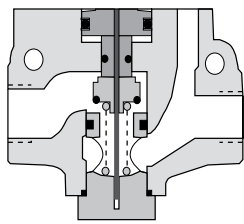
- Poppet construction for near zero leakage & high dirt tolerance
- Self-cleaning
- Wear compensating
- Repeatability throughout the life of the valve

Series 21 Valve Bodies

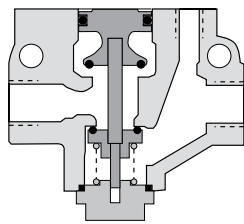
O-ring piston seals have Teflon wear rings top and bottom. Inlet and exhaust poppets have spun-in O-ring seals.



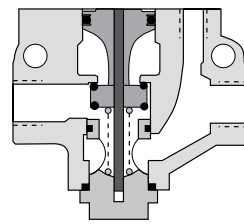
2/2 Normally Closed



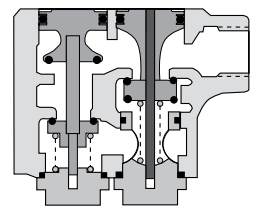
2/2 Normally Open



3/2 Normally Closed



3/2 Normally Open



4/2

STANDARD SPECIFICATIONS: For valves on page 8.

Solenoids: AC or DC power.

Standard Voltages: Consult ROSS.

Power Consumption: 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.

Ambient Temperature: *Type H:* 0° to 250°F (-17° to 122°C).

Type O: -40° to 120°F (-40° to 50°C).

Media Temperature: *Type H:* 0° to 300°F (-17° to 150°C).

Type O: -40° to 175°F (-40° to 80°C).

For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 30 to 150 psig (2 to 10 bar).

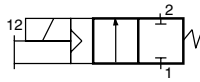
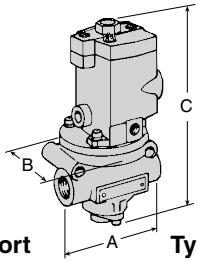
Pilot Pressure: When external supply is used, pressure must be equal to or greater than inlet pressure.

Threads: Model numbers above specify NPT pressure port threads. For other threads, consult ROSS.

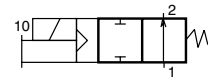
Manual Override: Non-locking metal button.

Series 21 Poppet Valves for Line Mounting

Single Solenoid Pilot Controlled 2/2 Valves



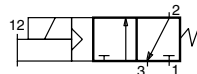
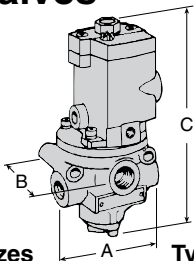
2/2 Normally Closed (NC)



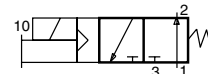
2/2 Normally Open (NO)

| Port Size | Valve Model Number | | | | Avg. C _v | | Dimensions inches (mm) | | | Weight lb (kg) |
|-----------|--------------------|-----------|-----------|-----------|---------------------|-----|------------------------|-----------|------------|----------------|
| | Type H | | Type O | | NC | NO | A | B | C | |
| | NC | NO | NC | NO | | | | | | |
| 1/4 | 2171B2001 | 2172B2001 | 2171B2002 | 2172B2002 | 2.3 | 2.3 | 3.6 (90) | 3.0 (76) | 7.0 (178) | 3.0 (1.4) |
| 3/8 | 2171B3001 | 2172B3001 | 2171B3002 | 2172B3002 | 3.8 | 3.3 | 3.6 (90) | 3.0 (76) | 7.0 (178) | 3.0 (1.4) |
| 1/2 | 2171B4011 | 2172B4011 | 2171B4012 | 2172B4012 | 4.0 | 3.5 | 3.6 (90) | 3.0 (76) | 7.0 (178) | 3.0 (1.4) |
| 1/2 | 2171B4001 | 2172B4001 | 2171B4002 | 2172B4002 | 7.7 | 6.5 | 4.6 (116) | 3.0 (76) | 7.7 (196) | 3.3 (1.5) |
| 3/4 | 2171B5001 | 2172B5001 | 2171B5002 | 2172B5002 | 9.0 | 7.3 | 4.6 (116) | 3.0 (76) | 7.7 (196) | 3.3 (1.5) |
| 1 | 2171B6011 | 2172B6011 | 2171B6012 | 2172B6012 | 9.0 | 7.9 | 4.6 (116) | 3.0 (76) | 7.7 (196) | 3.3 (1.5) |
| 1 | 2171B6001 | 2172B6001 | 2171B6002 | 2172B6002 | 24 | 21 | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |
| 1¼ | 2171B7001 | 2172B7001 | 2171B7002 | 2172B7002 | 29 | 20 | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |
| 1½ | 2171B8011 | 2172B8011 | 2171B8012 | 2172B8012 | 29 | 21 | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |

3/2 Valves



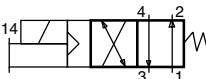
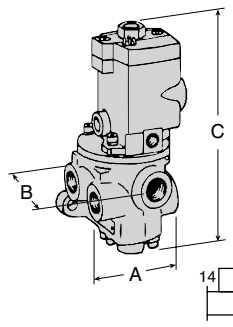
3/2 Normally Closed (NC)



3/2 Normally Open (NO)

| Port Sizes In-Out Exh. | | Valve Model Number | | | | Avg. C _v | | Dimensions inches (mm) | | | Weight lb (kg) |
|------------------------|-----|--------------------|-----------|-----------|-----------|---------------------|-----|------------------------|-----------|------------|----------------|
| | | Type H | | Type O | | NC | NO | A | B | C | |
| | | NC | NO | NC | NO | | | | | | |
| 1/4 | 1/2 | 2173B2001 | 2174B2001 | 2173B2002 | 2174B2002 | 2.8 | 2.5 | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 3/8 | 1/2 | 2173B3001 | 2174B3001 | 2173B3002 | 2174B3002 | 4.0 | 3.0 | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 1/2 | 1/2 | 2173B4011 | 2174B4011 | 2173B4012 | 2174B4012 | 3.8 | 3.0 | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 1/2 | 1 | 2173B4001 | 2174B4001 | 2173B4002 | 2174B4002 | 7.8 | 7.2 | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 3/4 | 1 | 2173B5001 | 2174B5001 | 2173B5002 | 2174B5002 | 9.4 | 7.2 | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 1 | 1 | 2173B6011 | 2174B6011 | 2173B6012 | 2174B6012 | 10 | 7.2 | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 1 | 1½ | 2173B6001 | 2174B6001 | 2173B6002 | 2174B6002 | 29 | 21 | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1¼ | 1½ | 2173B7001 | 2174B7001 | 2173B7002 | 2174B7002 | 31 | 22 | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1½ | 1½ | 2173B8011 | 2174B8011 | 2173B8012 | 2174B8012 | 31 | 21 | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |

4/2 Valves



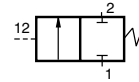
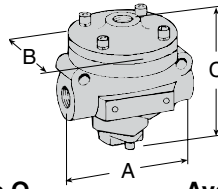
| Port Sizes In-Out Exh. | | Valve Model Number | | Avg. C _v | Dimensions inches (mm) | | | Weight lb (kg) |
|------------------------|-----|--------------------|-----------|---------------------|------------------------|-----------|------------|----------------|
| | | Number | | | A | B | C | |
| 1/4 | 1/2 | 2176B2001 | 2176B2002 | 2.5 | 3.8 (97) | 3.9 (99) | 7.7 (196) | 3.0 (1.4) |
| 3/8 | 1/2 | 2176B3001 | 2176B3002 | 3.6 | 3.8 (97) | 3.9 (99) | 7.7 (196) | 3.0 (1.4) |
| 1/2 | 1/2 | 2176B4011 | 2176B4012 | 3.7 | 3.8 (97) | 3.9 (99) | 7.7 (196) | 3.0 (1.4) |
| 1/2 | 1 | 2176B4001 | 2176B4002 | 6.9 | 5.2 (132) | 4.6 (104) | 9.7 (246) | 5.8 (2.6) |
| 3/4 | 1 | 2176B5001 | 2176B5002 | 8.2 | 5.2 (132) | 4.6 (104) | 9.7 (246) | 5.8 (2.6) |
| 1 | 1 | 2176B6011 | 2176B6012 | 8.9 | 5.2 (132) | 4.6 (104) | 9.7 (246) | 5.8 (2.6) |
| 1 | 1½ | 2176B6001 | 2176B6002 | 23 | 8.2 (208) | 6.5 (165) | 11.1 (282) | 12.0 (5.4) |
| 1¼ | 1½ | 2176B7001 | 2176B7002 | 24 | 8.2 (208) | 6.5 (165) | 11.1 (282) | 12.0 (5.4) |
| 1½ | 1½ | 2176B8011 | 2176B8012 | 25 | 8.2 (208) | 6.5 (165) | 11.1 (282) | 12.0 (5.4) |

STANDARD SPECIFICATIONS: See page 7.

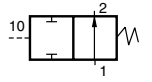
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

Series 21 Poppet Valves for Line Mounting

Single Pressure Controlled 2/2 Valves



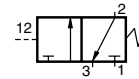
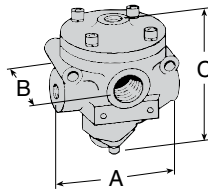
2/2 Normally Closed (NC)



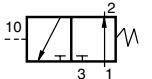
2/2 Normally Open (NO)

| Port Size | Valve Model Number | | | | Avg. C _v | | Dimensions inches (mm) | | | Weight lb (kg) |
|-----------|--------------------|-----------|-----------|-----------|---------------------|-----|------------------------|-----------|-----------|----------------|
| | Type H NC | Type H NO | Type O NC | Type O NO | NC | NO | A | B | C | |
| 1/4 | 2151B2001 | 2152B2001 | 2151B2002 | 2152B2002 | 2.3 | 2.3 | 3.6 (90) | 3.7 (94) | 3.0 (94) | 1.8 (0.8) |
| 3/8 | 2151B3001 | 2152B3001 | 2151B3002 | 2152B3002 | 3.8 | 3.3 | 3.6 (90) | 3.7 (94) | 3.0 (94) | 1.8 (0.8) |
| 1/2 | 2151B4011 | 2152B4011 | 2151B4012 | 2152B4012 | 4.0 | 3.5 | 3.6 (90) | 3.7 (94) | 3.0 (94) | 1.8 (0.8) |
| 1/2 | 2151B4001 | 2152B4001 | 2151B4002 | 2152B4002 | 7.7 | 6.5 | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 3/4 | 2151B5001 | 2152B5001 | 2151B5002 | 2152B5002 | 9.0 | 7.3 | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 1 | 2151B6011 | 2152B6011 | 2151B6012 | 2152B6012 | 9.0 | 7.9 | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 1 | 2151B6001 | 2152B6001 | 2151B6002 | 2152B6002 | 24 | 21 | 6.6 (168) | 7.5 (190) | 4.1 (104) | 11.0 (5.0) |
| 1¼ | 2151B7001 | 2152B7001 | 2151B7002 | 2152B7002 | 29 | 20 | 6.6 (168) | 7.5 (190) | 4.1 (104) | 11.0 (5.0) |
| 1½ | 2151B8011 | 2152B8011 | 2151B8012 | 2152B8012 | 29 | 21 | 6.6 (168) | 7.5 (190) | 4.1 (104) | 11.0 (5.0) |

3/2 Valves



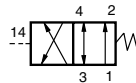
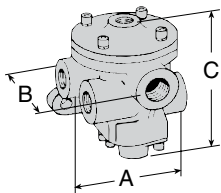
3/2 Normally Closed (NC)



3/2 Normally Open (NO)

| Port Sizes In-Out Exh. | | Valve Model Number | | | | Avg. C _v | | Dimensions inches (mm) | | | Weight lb (kg) |
|------------------------|-----|--------------------|-----------|-----------|-----------|---------------------|-----|------------------------|-----------|-----------|----------------|
| | | Type H NC | Type H NO | Type O NC | Type O NO | NC | NO | A | B | C | |
| 1/4 | 1/2 | 2153B2001 | 2154B2001 | 2153B2002 | 2154B2002 | 2.8 | 2.5 | 3.6 (90) | 4.0 (101) | 3.1 (79) | 1.8 (0.8) |
| 3/8 | 1/2 | 2153B3001 | 2154B3001 | 2153B3002 | 2154B3002 | 4.0 | 3.0 | 3.6 (90) | 4.0 (101) | 3.1 (79) | 1.8 (0.8) |
| 1/2 | 1/2 | 2153B4011 | 2154B4011 | 2153B4012 | 2154B4012 | 3.8 | 3.0 | 3.6 (90) | 4.0 (101) | 3.1 (79) | 1.8 (0.8) |
| 1/2 | 1 | 2153B4001 | 2154B4001 | 2153B4002 | 2154B4002 | 7.8 | 7.2 | 4.6 (116) | 4.7 (120) | 3.6 (91) | 4.5 (2.0) |
| 3/4 | 1 | 2153B5001 | 2154B5001 | 2153B5002 | 2154B5002 | 9.4 | 7.2 | 4.6 (116) | 4.7 (120) | 3.6 (91) | 4.5 (2.0) |
| 1 | 1 | 2153B6011 | 2154B6011 | 2153B6012 | 2154B6012 | 10 | 7.2 | 4.6 (116) | 4.7 (120) | 3.6 (91) | 4.5 (2.0) |
| 1 | 1½ | 2153B6001 | 2154B6001 | 2153B6002 | 2154B6002 | 29 | 21 | 6.6 (168) | 7.5 (190) | 4.8 (123) | 11.0 (5.0) |
| 1¼ | 1½ | 2153B7001 | 2154B7001 | 2153B7002 | 2154B7002 | 31 | 22 | 6.6 (168) | 7.5 (190) | 4.8 (123) | 11.0 (5.0) |
| 1½ | 1½ | 2153B8011 | 2154B8011 | 2153B8012 | 2154B8012 | 31 | 21 | 6.6 (168) | 7.5 (190) | 4.8 (123) | 11.0 (5.0) |

4/2 Valves



| Port Sizes In-Out Exh. | | Valve Model Number | | Avg. C _v | Dimensions inches (mm) | | | Weight lb (kg) |
|------------------------|-----|--------------------|-----------|---------------------|------------------------|------------|-----------|----------------|
| | | | | | A | B | C | |
| 1/4 | 1/2 | 2156B2001 | 2156B2002 | 2.5 | 3.8 (97) | 7.7 (196) | 3.9 (99) | 3.0 (1.4) |
| 3/8 | 1/2 | 2156B3001 | 2156B3002 | 3.6 | 3.8 (97) | 7.7 (196) | 3.9 (99) | 3.0 (1.4) |
| 1/2 | 1/2 | 2156B4011 | 2156B4012 | 3.7 | 3.8 (97) | 7.7 (196) | 3.9 (99) | 3.0 (1.4) |
| 1/2 | 1 | 2156B4001 | 2156B4002 | 6.9 | 5.2 (132) | 9.7 (246) | 4.6 (104) | 5.8 (2.6) |
| 3/4 | 1 | 2156B5001 | 2156B5002 | 8.2 | 5.2 (132) | 9.7 (246) | 4.6 (104) | 5.8 (2.6) |
| 1 | 1 | 2156B6011 | 2156B6012 | 8.9 | 5.2 (132) | 9.7 (246) | 4.6 (104) | 5.8 (2.6) |
| 1 | 1½ | 2156B6001 | 2156B6002 | 23 | 8.2 (208) | 11.1 (282) | 6.5 (165) | 12.0 (5.4) |
| 1¼ | 1½ | 2156B7001 | 2156B7002 | 24 | 8.2 (208) | 11.1 (282) | 6.5 (165) | 12.0 (5.4) |
| 1½ | 1½ | 2156B8011 | 2156B8012 | 25 | 8.2 (208) | 11.1 (282) | 6.5 (165) | 12.0 (5.4) |

STANDARD SPECIFICATIONS: For valves on this page.

Ambient/Media Temperatures:

Type H: 0° to 300°F (-17° to 150°C).

Type O: -40° to 175°F (-40° to 80°C).

For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 30 to 150 psig (2 to 10 bar).

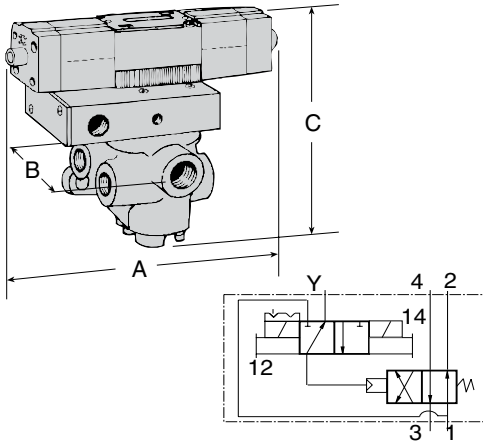
Pilot Pressure: Must be equal to or greater than inlet pressure.

Threads: Model numbers above specify NPT pressure port threads. For other threads, consult ROSS.

IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

Series 21 Poppet Valves for Line Mounting

4/2 Valves – Double Direct Solenoid Controlled, Detented



| Port Sizes | | Valve Model Number | Avg. C _v | Dimensions inches (mm) | | | Weight lb (kg) |
|------------|------|--------------------|---------------------|------------------------|-----------|------------|----------------|
| In-Out | Exh. | | | A | B | C | |
| 1/4 | 1/2 | 2176C2003 | 2.5 | 8.9 (226) | 3.9 (97) | 6.9 (176) | 4.0 (1.8) |
| 3/8 | 1/2 | 2176C3003 | 3.6 | 8.9 (226) | 3.9 (97) | 6.9 (176) | 4.0 (1.8) |
| 1/2 | 1/2 | 2176C4013 | 3.7 | 8.9 (226) | 3.9 (97) | 6.9 (176) | 4.0 (1.8) |
| 1/2 | 1 | 2176C4003 | 6.9 | 8.9 (226) | 5.2 (132) | 8.7 (221) | 6.5 (3.0) |
| 3/4 | 1 | 2176C5003 | 8.2 | 8.9 (226) | 5.2 (132) | 8.7 (221) | 6.5 (3.0) |
| 1 | 1 | 2176C6013 | 8.9 | 8.9 (226) | 5.2 (132) | 8.7 (221) | 6.5 (3.0) |
| 1 | 1½ | 2176C6003 | 23 | 8.9 (226) | 8.2 (208) | 10.4 (265) | 13.3 (6.0) |
| 1¼ | 1½ | 2176C7003 | 24 | 8.9 (226) | 8.2 (208) | 10.4 (265) | 13.3 (6.0) |
| 1½ | 1½ | 2176C8013 | 25 | 8.9 (226) | 8.2 (208) | 10.4 (265) | 13.3 (6.0) |

STANDARD SPECIFICATIONS: For valves listed above.

Solenoids: AC or DC power.

Standard Voltages: Consult ROSS.

Power Consumption: Each solenoid; 190 VA inrush, 40 VA holding on 50 or 60 Hz; 20 watts on DC.

Indicator Lights: In each solenoid housing.

Ambient Temperature: 40° to 120°F (4° to 50°C).

Media Temperature: 40° to 175°F (4° to 80°C).

For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 30 to 150 psig (2 to 10 bar).

Pilot Pressure: If external supply is used, pressure must be equal to or greater than inlet pressure.

Threads: Model numbers above specify NPT pressure port threads. For other threads, consult ROSS.

IMPORTANT NOTE

Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

What are Vacuum Service Valves?

Vacuum service valves are ideal for lifting, holding, vacuum packaging and moving anything from large objects to tiny particles. They also provide an effective means for leak testing. The vacuum source typically comes from either a vacuum pump or a venturi. In vacuum service applications, the pressure within the valve is reduced below atmospheric pressure. Consequently, atmospheric pressure actually pushes air into the valve, instead of the common belief that air is "sucked" in by the vacuum.

In normal valves, filters exist to clean compressed air, which is then pushed through the valve. In vacuum valves, there is no filter, and the air comes from the atmosphere and enters through the outlet, bringing with it atmospheric and nearby surface dust and dirt. Vacuum valves, in order to function consistently, must therefore be highly tolerant of the particles that freely flow into the valves.

To construct a vacuum service valve system, typically a 3/2 normally closed valve is used. The vacuum is on the inlet, while the exhaust remains open to atmosphere. Port 2 is the working port. However, if there is a need for the vacuum service valve to

function as normally open, simply connect the vacuum source to the exhaust and port 1 to atmosphere. Several variations of this construction are effective, including using 2/2 valves.

"Full Vacuum" Valves

Though there are fewer applications for full vacuum valves than regular vacuum valves, full vacuum valves are ideal for applications where compressed air is unavailable. Full vacuum valves use the difference in force between atmospheric pressure and the vacuum within the valve to actuate the valve. The full vacuum valve performs with atmospheric pressure in port 1 and 10 to 30 inches of Mercury vacuum in the valve body.

Remote Air or Solenoid-Piloted Vacuum Valves

Pilot vacuum valves provide a greater variety of applications, operating with a combination of vacuum and atmospheric pressure. The pilot must be supplied externally with a minimum of 30 psig. Vacuum valves can be used as either 3/2 normally closed or normally open valves, with vacuum supplied at either port 1 or port 3. Normally closed and normally open 2/2 versions are also available.

Anatomy of a Vacuum Service Valve

Special ROSS poppets are the toughest available, ideal for dirty vacuum applications. ROSS poppets also have large flow areas, which allow high flow.

ROSS vacuum valves have larger orifices, allowing greater flow and easing the transport of air even though there is a small differential between the vacuum within the valve and atmospheric pressure outside the valve.

ROSS poppet valves have specially designed seals for vacuum service applications that provide reliability and less leakage.



Pilot can be fed to port X-1 externally by compressed air. Internally, atmospheric pressure can be used as pilot for "full vacuum" version.

Typical applications place vacuum or atmosphere on port 1 (the inlet port in non-vacuum applications).

Port 3 is open to atmosphere or vacuum, depending on application.

Port 2 is the working port.

Why a ROSS Vacuum Valve?

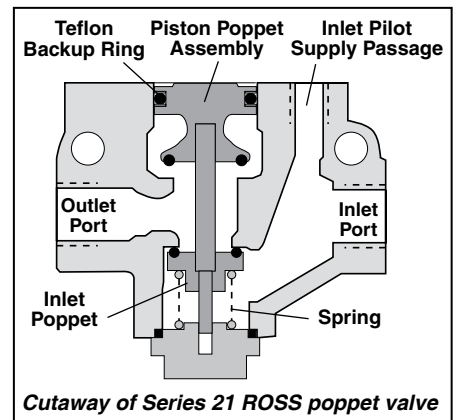
In non-vacuum valves, maintaining consistent shift time is easier because clean air flows through the valve. However, the absence of a filter in vacuum service applications means that vacuum valve internals must be able to withstand high levels of dirt and continue shifting. That's why ROSS uses its famous poppet design in its vacuum valves.

ROSS Poppet Valves

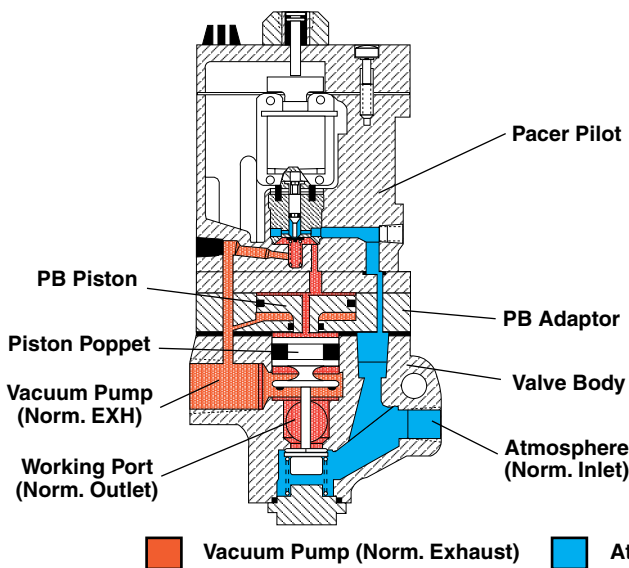
ROSS poppets are known for their ability to withstand the harshest of environments and keep working consistently. What makes ROSS poppets shift so consistently and seal so effectively is its unbalanced design. The areas of the piston, the exhaust poppet and the inlet poppet are precisely designed to produce strong shifting forces in either direction as well as strong forces to keep the poppets sealed. In vacuum valve applications, a stronger spring is used to ensure the necessary shifting and sealing forces are maintained. Sometimes things get lodged between the poppet and the sealing surface. However, with the ROSS poppet valve design, anything caught inside is forced through the valve by the high velocity air flow within a few cycles. Flow velocity is dependent upon the area through which a volume of air is flowing. The smaller the area is, the greater the velocity will be. In ROSS poppet valves, the smallest flow-through area is across the poppet's seal and seat, momentarily, as the valve shifts. This design allows a high velocity, thereby blowing all dirt and foreign matter out of the seat area to provide a virtually leak-proof seal.

ROSS poppet valves are also effective because they achieve full flow quicker. In addition, ROSS poppet valves have large orifices, which are conducive to greater flow in low pressure differential situations, such as vacuum service.

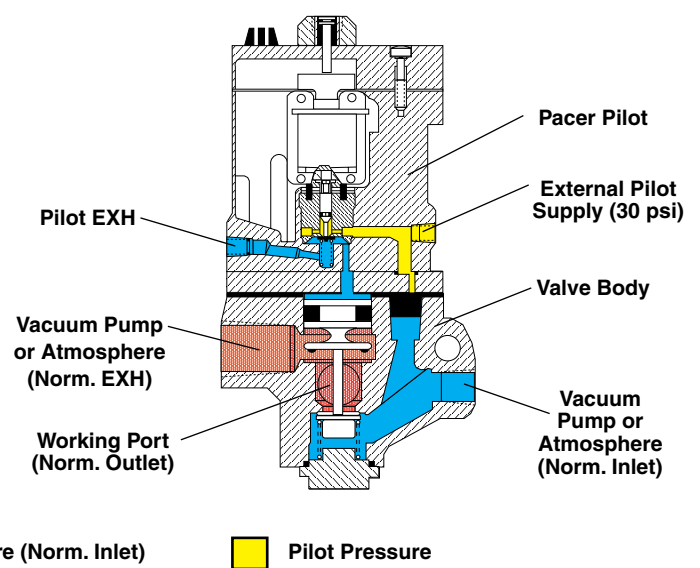
For more information on vacuum service valves, contact ROSS Technical Services at (888) TEK-ROSS.



Solenoid Piloted "Full Vacuum" Valve Cross-Section

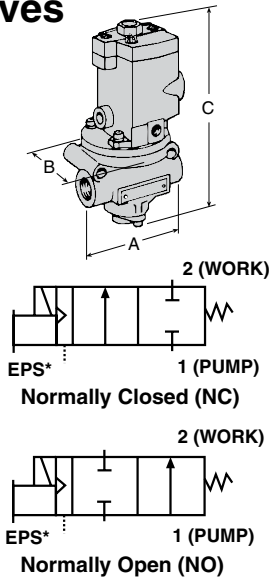


Solenoid Piloted Valve with External Pilot Supply Cross-Section



Series 21 Solenoid Pilot Controlled Vacuum Valves

2/2 Valves



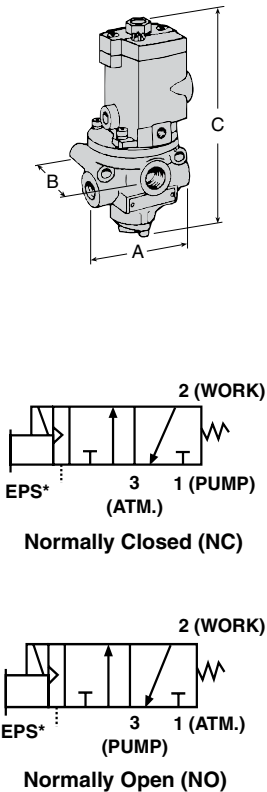
Piping 2/2 Normally Closed or Normally Open Valves

Pipe the unit into the system by connecting the vacuum source or pump to the normal air pressure inlet port (port 1). The normal outlet port is the work port (port 2).

Note: 2/2 vacuum valves provide only on/off control and do not have an exhaust function.

| Port Size | Valve Model Number | Avg. Cv | Function | Dimensions inches (mm) | | | Weight lb (kg) |
|-----------|--------------------|---------|----------|------------------------|-----------|------------|----------------|
| | | | | A | B | C | |
| 1/4 | 2171B2901 | 2.1 | NC | 3.6 (91) | 3.0 (76) | 7.0 (178) | 3.0 (1.4) |
| 1/4 | 2171B2908 | 2.1 | NC | 3.6 (91) | 3.0 (76) | 7.0 (178) | 3.0 (1.4) |
| 3/8 | 2171B3906 | 2.6 | NC | 3.6 (91) | 3.0 (76) | 7.0 (178) | 3.0 (1.4) |
| 3/4 | 2171B5905 | 7.8 | NC | 4.6 (117) | 3.0 (76) | 7.7 (196) | 3.3 (1.5) |
| 1 | 2171B6904 | 8.3 | NC | 4.6 (117) | 3.0 (76) | 7.7 (196) | 3.3 (1.5) |
| 1 | 2171B6916 | 20 | NC | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |
| 1¼ | 2171B7901 | 30 | NC | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |
| 1½ | 2171B8906 | 31 | NC | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |
| 1½ | 2172B8900 | 21 | NO | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |
| 2 | 2171A9900 | 57 | NC | 8.7 (219) | 5.2 (131) | 11.8 (300) | 15.5 (6.9) |
| 2 | 2172B9901 | 57 | NO | 8.7 (219) | 5.2 (131) | 11.8 (300) | 15.5 (6.9) |
| 2½ | 2171B9901 | 64 | NC | 8.7 (219) | 5.2 (131) | 11.8 (300) | 15.5 (6.9) |

3/2 Valves



Piping 3/2 Normally Closed Valves

In this valve configuration, pipe the unit into the system by connecting the vacuum source or pump to the normal air pressure inlet port (port 1). The normal outlet port is the work port (port 2), and the normal air pressure exhaust port becomes the atmosphere port (port 3).

Piping 3/2 Normally Open Valves

To obtain a 3/2 normally open ROSS vacuum valve, simply pipe the 3/2 normally closed body slightly differently. Connect the vacuum source or pump to port 3, the normal exhaust. Leave port 1 open to atmosphere, and the normal outlet remains as the work port (port 2).

| Port Size In-Out | Exh. | Valve Model Number | Avg. Cv | | Function | Dimensions inches (mm) | | | Weight lb (kg) |
|------------------|------|--------------------|---------|----------|----------|------------------------|-----------|------------|----------------|
| | | | In-Out | Out-Exh. | | A | B | C | |
| 1/4 | 1/2 | 2173B2900 | 2.4 | 3.4 | NC | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 3/8 | 1/2 | 2173B3900 | 3.0 | 5.8 | NC | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 3/8 | 1/2 | 2174B3900 | 3.0 | 5.8 | NC | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 3/8 | 1/2 | 2173B3908 | 3.0 | 5.8 | NO | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 1/2 | 1/2 | 2173B4901 | 3.0 | 5.2 | NC | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 1/2 | 1 | 2173B4902 | 6.6 | 12 | NC | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 1/2 | 1 | 2174A4912 | 6.5 | 7.0 | NC | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 3/4 | 1 | 2173B5900 | 7.8 | 13 | NC | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 3/4 | 1 | 2173B5903 | 7.5 | 7.5 | NC | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 1 | 1 | 2173B6901 | 7.5 | 12 | NC | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 1 | 1½ | 2173B6902 | 24 | 40 | NC | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1 | 1½ | 2174A6914 | 15 | 17 | NO | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1¼ | 1½ | 2173B7901 | 29 | 39 | NC | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1¼ | 1½ | 2173B7917 | 29 | 39 | NO | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1½ | 1½ | 2173A8911 | 30 | 38 | NC | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1½ | 2½ | 2173A8915 | 68 | 70 | NC | 8.7 (219) | 6.4 (161) | 12.4 (313) | 16.5 (7.4) |
| 2 | 2½ | 2173A9905 | 70 | 70 | NC | 8.7 (219) | 6.4 (161) | 12.4 (313) | 16.5 (7.4) |
| 2½ | 2½ | 2173A9906 | 70 | 71 | NC | 8.7 (219) | 6.4 (161) | 12.4 (313) | 16.5 (7.4) |

STANDARD SPECIFICATIONS: For valves on this page.

Solenoids: Rated for continuous duty.

Standard voltages: 100-110 volts 50 Hz; 100-120 volts 60 Hz; 24, 110 volts DC.

Power Consumption: 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 Watts on DC.

Ambient Temperature: -40° to 120° F (-40° to 50° C). (For low temperature valves; High temperature valves also available.)

Media Temperature: -40° to 175° F (-40° to 80° C).

Flow Media: Vacuum and/or filtered-compressed air.

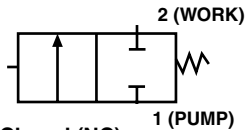
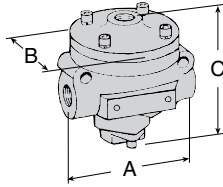
Pressure: Vacuum to 150 psig.

***External Pilot Pressure:** Equal or higher than inlet pressure, but not less than 30 psig.

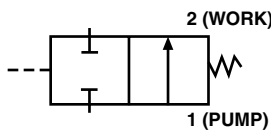
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

Series 21 Pressure Controlled Vacuum Valves

2/2 Valves



Normally Closed (NC)



Normally Open (NO)

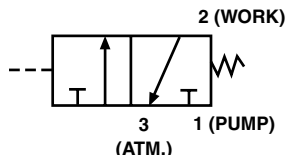
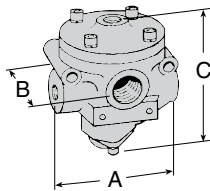
Piping 2/2 Normally Closed Valves

Pipe the unit into the system by connecting the vacuum source or pump to the normal air pressure inlet port (port 1). The normal outlet port is the work port (port 2).

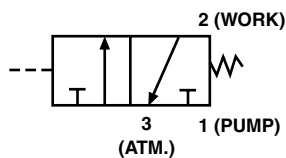
Note: 2/2 vacuum valves provide only on/off control and do not have an exhaust function.

| Port Size | Valve Model Number | Avg. Cv | Function | Dimensions inches (mm) | | | Weight lb (kg) |
|-----------|--------------------|---------|----------|------------------------|-----------|-----------|----------------|
| | | | | A | B | C | |
| 1/4 | 2151A2901 | 2.1 | NC | 3.6 (90) | 3.7 (94) | 3.0 (94) | 1.8 (0.8) |
| 1/2 | 2151B4904 | 6.9 | NC | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 1/2 | 2151A4910 | 3.0 | NC | 3.6 (90) | 3.7 (94) | 3.0 (94) | 1.8 (0.8) |
| 3/4 | 2151A5913 | 7.8 | NC | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 3/4 | 2151A5914 | 7.8 | NC | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 3/4 | 2152A5901 | 7.0 | NO | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 1 | 2151B6900 | 8.3 | NC | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 1¼ | 2151A7909 | 30 | NC | 6.6 (168) | 7.5 (190) | 4.1 (104) | 11.0 (5.0) |
| 1½ | 2151B8900 | 31 | NC | 6.6 (168) | 7.5 (190) | 4.1 (104) | 11.0 (5.0) |
| 1½ | 2152B7900 | 23 | NO | 6.6 (168) | 7.5 (190) | 4.1 (104) | 11.0 (5.0) |

3/2 Valves



Normally Closed (NC)



Normally Open (NO)

Piping 3/2 Normally Closed Valves

In this valve configuration, pipe the unit into the system by connecting the vacuum source or pump to the normal air pressure inlet port (port 1). The normal outlet port is the work port (port 2), and the normal air pressure exhaust port becomes the atmosphere port (port 3).

Piping 3/2 Normally Open Valves

To obtain a 3/2 normally open ROSS vacuum valve, simply pipe the 3/2 normally closed body slightly differently. Connect the vacuum source or pump to port 3, the normal exhaust. Leave port 1 open to atmosphere, and the normal outlet remains as the work port (port 2).

| Port Size In-Out | Exh. | Valve Model Number | Avg. Cv | | Function | Dimensions inches (mm) | | | Weight lb (kg) |
|------------------|------|--------------------|---------|----------|----------|------------------------|-----------|-----------|----------------|
| | | | In-Out | Out-Exh. | | A | B | C | |
| 1/4 | 1/2 | 2153B2900 | 2.4 | 3.4 | NC | 3.6 (90) | 4.0 (101) | 3.1 (79) | 1.8 (0.8) |
| 1/2 | 1/2 | 2153B4903 | 3.0 | 5.2 | NC | 3.6 (90) | 4.0 (101) | 3.1 (79) | 1.8 (0.8) |
| 3/4 | 1 | 2153B5903 | 7.8 | 13 | NC | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 1 | 1½ | 2153C6905 | 24 | 40 | NC | 6.6 (168) | 7.5 (190) | 4.8 (123) | 11.0 (5.0) |
| 1 | 1 | 2153A6906 | 7.4 | 12 | NO | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 1¼ | 1½ | 2153A7906 | 29 | 39 | NC | 6.6 (168) | 7.5 (190) | 4.8 (123) | 11.0 (5.0) |
| 1½ | 1½ | 2153B8900 | 30 | 38 | NC | 6.6 (168) | 7.5 (190) | 4.8 (123) | 11.0 (5.0) |
| 2½ | 2½ | 2153A9902 | 70 | 71 | NC | 8.7 (219) | 6.4 (161) | 9.5 (241) | 15.3 (6.9) |
| 2 | 2½ | 2154A9900 | 58 | 61 | NC | 8.7 (219) | 6.4 (161) | 9.5 (241) | 15.3 (6.9) |

STANDARD SPECIFICATIONS: For valves on this page.

Media Temperature: -40° to 175° F (-40° to 80° C).

Flow Media: Vacuum and/or filtered-compressed air.

Pressure: Vacuum to 150 psig.

Signal Pressure: Equal or higher than inlet pressure, but not less than 30 psig.

STANDARD SPECIFICATIONS: For full vacuum valves on page 14.

Solenoids: Rated for continuous duty.

Standard voltages 100-110 volts 50 Hz; 100-120 volts 60 Hz; 24, 110 volts DC.

Power Consumption: 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 Watts on DC.

Ambient Temperature: -40° to 120° F (-40° to 50° C). (For low temperature valves; High temperature valves also available.)

Media Temperature: -40° to 175° F (-40° to 80° C).

Flow Media: Vacuum and/or filtered-compressed air.

Pressure: Vacuum to 150 psig.

***External Pilot Pressure:** Equal or higher than inlet pressure, but not less than 30 psig.

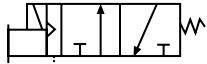
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.



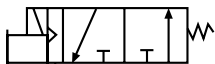
Series 21 Solenoid Pilot Controlled Full Vacuum Valves

Full Vacuum — 3-Way Normally Closed

This valve functions as a **normally open** valve. Pipe the unit into the system by connecting the vacuum source or pump to port 3, the normal exhaust. Leave port 1 open to atmosphere, and the normal outlet remains as the work port (port 2).



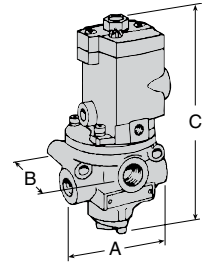
Normally Closed (NC)



Normally Open (NO)

Full Vacuum — 3-Way Normally Open

This valve functions as a **normally closed** valve. Pipe the unit into the system by connecting the vacuum source or pump to port 3, the normal exhaust. Leave port 1 open to atmosphere, and the normal outlet remains as the work port (port 2).



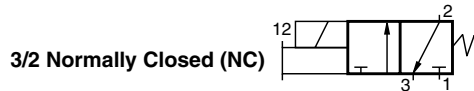
| Port Size In-Out | Exh. | Valve Model Number | Avg. Cv | | Function | Dimensions inches (mm) | | | Weight lb (kg) |
|---------------------|-------|-----------------------|---------|----------|----------|------------------------|-----------|------------|-------------------|
| | | | In-Out | Out-Exh. | | A | B | C | |
| 1/2 | 1/2 | 2173B4914 | 3.0 | 5.2 | NC | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 1/2 | 1/2 | 2174B4900 | 2.9 | 2.8 | NC | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 1 1/4 | 1 1/2 | 2173B7904 | 29 | 39 | NC | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1 1/4 | 1 1/2 | 2174A7903 | 21 | 23 | NO | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |

Series 16 Compact Poppet Valves, Line or Manifold Mounting

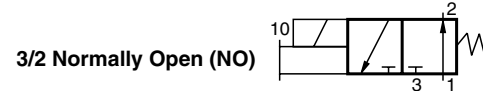
With Direct Acting Solenoid Control

Series 16 valves are direct acting solenoid valves of small size and high reliability. They are suitable for use either with or without air line lubrication. Valves are available for 1/8 and 1/4 port sizes in three valve types: 3/2 normally open or closed and 4/2. Models are available for either inline mounting or manifold mounting.

3/2 Valves – Single Direct Solenoid



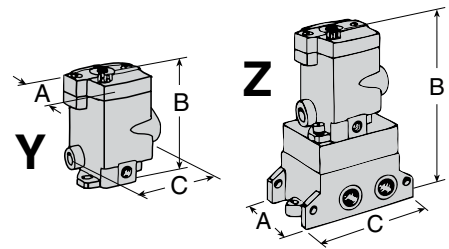
3/2 Normally Closed (NC)



3/2 Normally Open (NO)

| Port Size | Valve Type | Valve Model Numbers | | Avg. C _v | Dimensions inches (mm) | | | Weight lb (kg) |
|------------------------------|------------|---------------------|------------|---------------------|------------------------|-----------|-----------|----------------|
| | | NC | NO | | A | B | C | |
| For Line Mounting | | | | | | | | |
| 1/8 | Y | 1613B1020 | 1614B1020 | 0.3 | 2.7 (69) | 3.8 (95) | 3.0 (77) | 1.4 (0.6) |
| 1/4 | Y | 1613B2020 | 1614B2020 | 0.3 | 2.7 (69) | 3.8 (95) | 3.0 (77) | 1.4 (0.6) |
| For Manifold Mounting | | | | | | | | |
| 1/4 | Z | 1613C2322* | 1614B2322* | 0.3 | 2.7 (69) | 6.6 (168) | 4.2 (107) | 1.4 (0.6) |

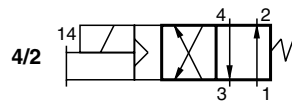
*Also order manifold **256B91** (not included with this valve).



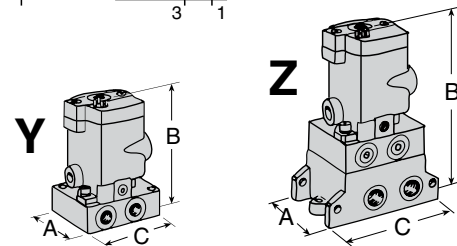
4/2 Valves – Single Solenoid Pilot Controlled

| Port Size | Valve Type | Valve Model Number | Avg. C _v | Dimensions inches (mm) | | | Weight lb (kg) |
|------------------------------|------------|--------------------|---------------------|------------------------|-----------|-----------|----------------|
| | | | | A | B | C | |
| For Line Mounting | | | | | | | |
| 1/4 | Y | 1616C2020 | 0.4 | 2.7 (69) | 4.8 (121) | 6.6 (168) | 2.4 (1.1) |
| For Manifold Mounting | | | | | | | |
| 1/4 | Z | 1616C2322* | 0.4 | 2.7 (69) | 6.6 (168) | 4.2 (107) | 2.4 (1.1) |

*Also order manifold **257B91** (not included with this valve).



4/2



IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

Series 16 Compact Poppet Valves, Line or Manifold Mounting

STANDARD SPECIFICATIONS: For valves on this page.

Solenoids: AC or DC power.

Standard Voltages: Consult ROSS.

Power Consumption: 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.

Ambient Temperature: 40° to 120°F (4° to 50°F).

Media Temperature: 40° to 175°F (4° to 80°C).

Inlet Pressure: 3/2 Valves: 5 to 150 psig (0.3 to 10 bar).
4/2 Valves: 30 to 150 psig (2 to 10 bar).

Flow Media: Filtered air; 5 micron recommended.

Manual Override: Flush flexible manual override (non-locking), standard.

Port Treads: NPT standard. For BSPP threads, add a "D" prefix to the model number; for J threads, add a "J" prefix to the model number.

Options:

Indicator Light: Order kit number **862K87** and specify the voltage of the solenoid.

Manual Override: Metal button; see Manual Override Kits.

Cautions

PRE-INSTALLATION or SERVICE

1. Before servicing a valve or other pneumatic component, be sure that all sources of energy are turned off, the entire pneumatic system is shut off and exhausted, and all power sources are locked-out (ref: OSHA 1910.147, EN 1037).
2. All ROSS products, including service kits and parts, should be installed and/or serviced only by persons having training and experience with pneumatic equipment. Because any installation can be tampered with or need servicing after installation, persons responsible for the safety of others or the care of equipment must check every installation on a regular basis and perform all necessary maintenance.
3. All applicable instructions should be read and complied with before using any fluid power system in order to prevent harm to persons or equipment. In addition, overhauled or serviced valves must be functionally tested prior to installation and use.
4. Each ROSS product should be used within its specification limits. In addition, use only ROSS parts to repair ROSS products. Failure to follow these directions can adversely affect the performance of the product or result in the potential for human injury.

FILTRATION and LUBRICATION

5. Dirt, scale, moisture, etc. are present in virtually every air system. Although some valves are more tolerant of these contaminants than others, best performance will be realized if a filter is installed to clean the air supply, thus preventing contaminants from interfering with the proper performance of the equipment. ROSS recommends a filter with a 5-micron rating for normal applications.
6. All standard ROSS filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. Do *not* fail to use the metal bowl guard, where provided, to minimize danger from high pressure fragmentation in the event of bowl failure. Do not expose these products to certain fluids, such as alcohol or liquefied petroleum gas, as they can cause bowls to rupture, creating a combustible condition, hazardous leakage, and the potential for human injury. Immediately replace a crazed, cracked, or deteriorated bowl. When bowl gets dirty, replace it or wipe it with a clean dry cloth.

7. Only use lubricants which are compatible with materials used in the valves and other components in the system. Normally, compatible lubricants are petroleum base oils with oxidation inhibitors, an aniline point between 180°F (82°C) and 220°F (104°C), and an ISO 32, or lighter, viscosity. Avoid oils with phosphate type additives which can harm polyurethane components, potentially leading to valve failure and/or human injury. If you have questions regarding whether a lubricant used on your system is compatible with ROSS products, please contact ROSS.

AVOID INTAKE/EXHAUST RESTRICTION

8. Do not restrict the air flow in the supply line. To do so could reduce the pressure of the supply air below the minimum requirements for the valve and thereby cause erratic action.
9. Do not restrict a valve's exhaust port as this can adversely affect its operation. Exhaust silencers must be resistant to clogging and have flow capacities at least as great as the exhaust capacities of the valves. Contamination of the silencer can result in reduced flow and increased back pressure.

ROSS expressly disclaims all warranties and responsibility for any unsatisfactory performance or injuries caused by the use of the wrong type, wrong size, or inadequately maintained silencer installed with a ROSS product.

POWER PRESSES

10. Mechanical power presses and other potentially hazardous machinery using a pneumatically controlled clutch and brake mechanism must use a press control double valve with a monitoring device. A double valve without a self-contained monitoring device should be used only in conjunction with a control system which assures monitoring of the valve. All double valve installations involving hazardous applications should incorporate a monitoring system which inhibits further operation of the valve and machine in the event of a failure within the valve mechanism.

ENERGY ISOLATION/EMERGENCY STOP

11. Per specifications and regulations, ROSS **L-O-X**® and manual **L-O-X**® with **EEZ-ON**® operation products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

WARRANTY

Products manufactured by ROSS are warranted to be free of defects in material and workmanship for a period of one year from the date of purchase. ROSS' obligation under this warranty is limited to repair or replacement of the product or refund of the purchase price paid solely at the discretion of ROSS and provided such product is returned to ROSS freight prepaid and upon examination by ROSS is found to be defective. This warranty shall be void in the event that product has been subject to misuse, misapplication, improper maintenance, modification or tampering. THE WARRANTY EXPRESSED ABOVE IS IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES AND ROSS EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED WITH RESPECT TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ROSS MAKES NO WARRANTY WITH RESPECT TO ITS PRODUCTS MEETING THE PROVISIONS OF ANY GOVERNMENTAL OCCUPATIONAL SAFETY AND/OR HEALTH LAWS OR REGULATIONS. IN NO EVENT SHALL ROSS BE LIABLE TO PURCHASER, USER, THEIR EMPLOYEES OR OTHERS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM A BREACH OF THE WARRANTY DESCRIBED ABOVE OR THE USE OR MISUSE OF THE PRODUCTS. NO STATEMENT OF ANY REPRESENTATIVE OR EMPLOYEE OF ROSS SHALL EXTEND THE LIABILITY OF ROSS AS SET FORTH HEREIN.





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To meet your requirements across the globe, ROSS distributors are located throughout the world. Through ROSS or its distributors, guidance is available for the selection of ROSS products, both for those using pneumatic components for the first time and those designing complex pneumatic systems.

This catalog presents an overview of the extensive ROSS product line. Other literature is available for engineering, maintenance, and service requirements. If you need products or specifications not shown here, please contact ROSS or your ROSS distributor. They will be happy to assist you in selecting the best product for your application.