Performance Automation Series User Manual

Pneumatically and Electrically Actuated Ball Valves

This User Manual covers Gemini's Models; C90 & C500 Pneumatic Actuators, WDM & WD Electric Actuators, and 87 Ball Valves. The publication of these instructions are intended as a guide only. Installation should only be performed by qualified personnel. **Additional support is also available by contacting Gemini Valve @ Telephone: 603 244-7931, Email: service@geminivalve.com.**

Contents

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2 Otter Court, Raymond, NH 03077 USA
T 603 244-7931 F 603 895-6785 E service@geminivalve.com
www.geminivalve.com

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Installation

Note: If the ball valve you are installing is equipped with an actuator, the actuator can be dismounted from the ball valve if desired to facilitate ease of installation. For further instructions see associated Pneumatic Actuator Models Installation C90, Page 4, C500 Page 6 and Electric WD2402 Models Page 15.

1. Ensure that both the male pipe and female valve threads are free from dirt, debris and corrosion. Wire brushing of the male pipe threads is recommended to ensure a good metal-to-metal joint.

2. Apply a good quality thread lubricant on the male threads. Lubricant reduces friction when making up the pipe joint. Note: thread lubricant is not intended to seal the joint and will not compensate for poor quality male pipe or fitting threads.

3. Turn the ball valve (female threads) onto the male pipe threads (or fitting) by hand. Continue to turn the valve as far up as it will go by hand. With the use of a wrench continue to tighten the valve onto the pipe. The pipe joint seal should occur within 1-3 turns after wrenching begins. Care should be taken not to exceed 3 turns in which damage to the threads can occur.

4. The pipe joint should be tested for leakage to ensure the pipe joint has been achieved.

Specifications

TEMPERATURE*:
P.T.F.E. (Glass Filled Reinforced Teflon®) with Viton®: -20˚F to 400˚F
P.T.F.E. (Glass Filled Reinforced Teflon®) with EPDM: -50˚F to 250˚F

VALVE BODY PRESSURE RATING*: 1,000 P.S.I** C.W.P.***

MAXIMUM PRESSURE DIFFERENTIAL: 400 P.S.I.**

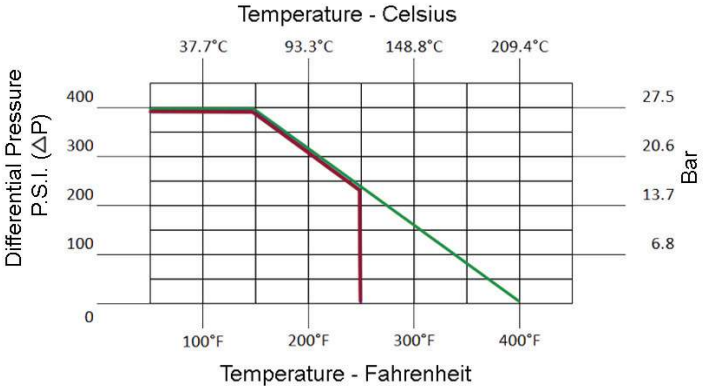
*see Differential Pressure - Temperature Chart below
**P.S.I. = Pounds Per Square Inch
***C.W.P. = Cold Working Pressure to 150˚F

CONNECTION STYLE / SIZE RANGE: 1/4" - 1"
Pipe / N.P.T. Female Screwed End
NOTE: other connections / sizes may be available upon request

MATERIALS:
BODY;
Brass - ASTM B-16
Carbon Steel (consult Gemini)
CF8M Stainless Steel
BALL; Type 316 Stainless Steel
STEM; Type 630 (17-4) Stainless Steel
SEATS AND STEM SEAL;
Glass Reinforced P.T.F.E. (Teflon ®) with Viton®
Glass Reinforced P.T.F.E. (Teflon ®) with EPDM

Specifications (continued)

DIFFERENTIAL PRESSURE - TEMPERATURE CHART



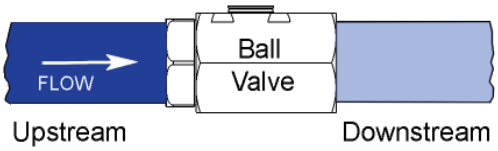
—P.T.F.E. (Glass Filled Reinforced Teflon®) with Viton®
—P.T.F.E. (Glass Filled Reinforced Teflon®) with EPDM

To Use the Pressure - Temperature Chart

Draw an imaginary line from your media Differential Pressure to your media Temperature to confirm it falls within the valve rating based upon the type of seal materials to be used.

To Calculate Pressure Differential

Compare the Upstream media pressure to the Downstream. The pressure differential should not exceed 400 P.S.I. See examples below;



Examples:

Upstream Pressure of 1,000 P.S.I. less Downstream of 625 P.S.I. equals 375 P.S.I. which is below 400 P.S.I. differential i.e. OK

Upstream Pressure of 600 P.S.I. Less Downstream of 0 P.S.I. equals 600 P.S.I. which is above 400 P.S.I. differential - outside of ratings not recommended.

Cv

Note: The values derived from the flow equation are for estimating purposes only. Product variances or systemic factors may alter actual performance.

Valve Size	1/4	3/8	1/2	3/4	1
Cv	8	8	8	12	32

Maintenance

Gemini's Performance Automation Series Ball Valves are 100% maintenance free and provide extended leak-tight service life. When used within our ratings, should stem or ball seat leakage occur, it would indicate that the ball valve has worn out and needs to be replaced.

Installation

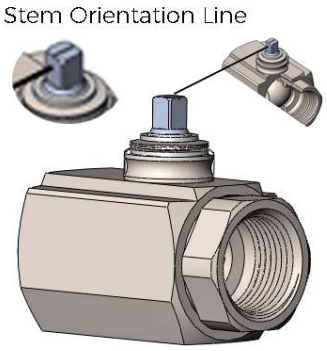
Gemini's Performance Automation ball valves feature a unique valve to actuator coupling design. The ball valve has a precisely machined locating bonnet which when combined with mating actuator gland, ensures alignment and rigidity. This eliminates stem side loading which results in premature stem seal leakage.

These instructions detail the procedure for mounting Gemini Models; C90BDB, C90BDBN, C90BDV, and C90BDVN Pneumatic Actuator(s) on a Model 87 Ball Valve.

Standard Mounting: In-line

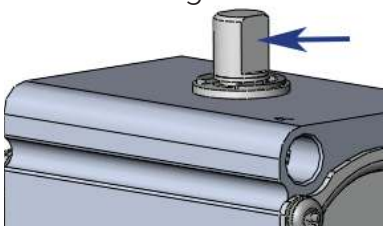
1. Confirm the ball valve to be mounted has the stem orientation line perpendicular to valve body for which the ball valve is in the closed position, Figure 1. If not rotate stem 90˚ using a wrench.

Figure 1



2. Confirm the Actuator Top Output Pinion (shaft) 'flats' are perpendicular to the actuator body, Figure 2. If not rotate 90˚ clockwise using a wrench.

Figure 2

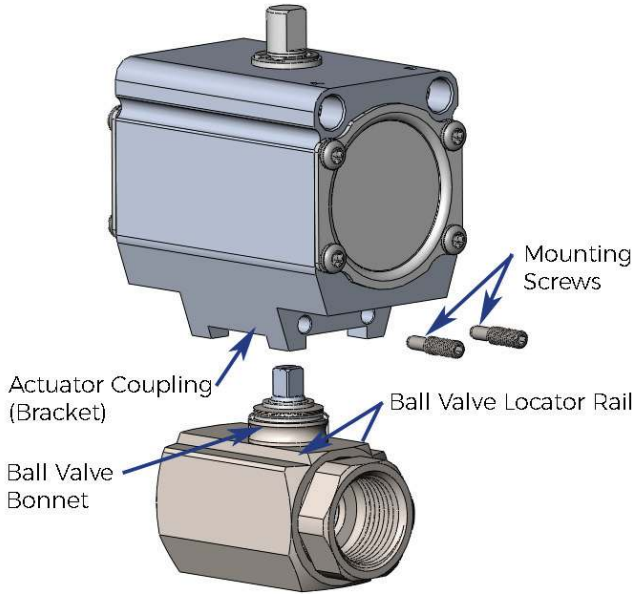


3. If not already in this state, back the (2) 3/32 Mounting Screws out of the actuator by turning them counter-clockwise. It is not necessary to remove them completely but sufficiently enough to enable the actuator coupling (bracket) to seat fully on the ball valve locator rail, Figure 3.

4. Place the actuator atop the ball valve so that the ball valve and actuator body axis are parallel (in-line) with each other, Figure 3.

5. Tighten using a torque wrench the (2) 3/32 Mounting Screws clockwise 12-15 Inch Lbs. Alternatively by hand clockwise until snug. Care should be taken not to over-tighten. When the Mounting Screws are tightened they engage the valve bonnet pulling the valve into the actuator and locking it in place.

Figure 3



Optional Cross Mounting

Figure 4

Following Standard Mounting In-line substituting Step 2 & 4 as follows;

2. Confirm the Actuator Top Output Pinion (shaft) 'flats' are parallel to the actuator body. If not, rotate 90˚ clockwise using a wrench.

4. Place the actuator atop the ball valve so that the ball valve and actuator body axis are perpendicular with each other, Figure 4.

Pneumatic Actuator Models C90

Specifications

TEMPERATURE:
-20˚F to 180˚F with Standard Buna N O-rings
-20˚F to 350˚F with optional Viton® O-rings

CYCLE (INDEX) TIME: Approximately 1/2-1 Second (Load Dependent)

[1]AIR SUPPLY: 60 - 125 P.S.I. Sufficient air delivery must be available at the actuator to ensure dependable operation. The following precautions should be observed: Air supply should be clean and free of moisture. When dirty or wet air is a problem; a filter / separator should be specified; these units are most effective when installed as close as possible to the actuator. A filter, when used, should permit a minimum flow of 4 scfm at an upstream pressure of 60 P.S.I. Eliminate severe restrictions to air flow (certain solenoid valves & fittings). The most restricted passage must have an area no smaller than .012 inches square, the area of 1/8" diameter orifice. If more than a single actuator is to be supplied by an individual pilot, the minimum passage requirement applies per actuator. All actuator models are permanently lubricated and are not recommended to be used with any other air supply lubricants.

TUBING: For short runs up to 5 feet 5/32" I.D. is suitable, 1/4" I.D. will serve up to 30 feet. For longer runs, use 3/8" I.D. or larger.

AIR CONNECTIONS: Female (2) 1/8" NPT Female, Optional NAMUR Interface

MATERIALS:
BODY - Aluminum with Hard Anodized Surfaces
EXTERNAL HARDWARE - Pinion Shaft / Driver Electroless Nickel Plated Carbon Steel, Endplate(s), Fasteners 300 Series Stainless Steel
O-RINGS - Buna N (standard), Optional Viton®

Operation

Use air to move the internal pistons in two directions which rotates the actuator pinion 90˚ which is attached to the ball valve stem. Air supplied to port 'A' causes counter clockwise rotation which with a normally closed assembly opens the ball valve. Air supplied to port 'B' causes clockwise rotation which in turn closes the ball valve. For most applications a four-way solenoid valve, like the Gemini model 4GP, is used to pilot the air. Remote piloting can also be achieved utilizing the 'A' & "B' air supply ports. In summary the solenoid (pilot) valve uses an electric signal to cycle air in and out of the pneumatic actuator subsequently opening / closing the ball valve.

Maintenance

Gemini's pneumatic actuators are engineered to be maintenance free. No adjustments or maintenance is required to achieve maximum service life. Care must be taken to ensure a clean / dry air supply is provided per the above AIR SUPPLY recommendations.

Installation

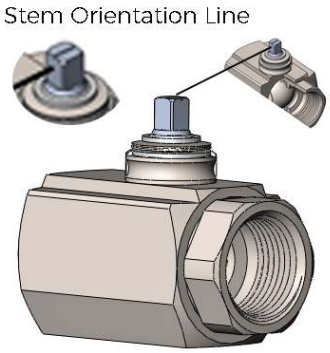
Gemini's Performance Automation ball valves feature a unique valve to actuator coupling design. The ball valve has a precisely machined locating bonnet which when combined with mating actuator gland, ensures alignment and rigidity. This eliminates stem side loading which results in premature stem seal leakage.

These instructions detail the procedure for mounting Gemini Models; C512D, C522D, C512SR, C522SR, C512SR5 and C522SR5 Pneumatic Actuator(s) on a Model 87 Ball Valve.

Standard Mounting: In-line

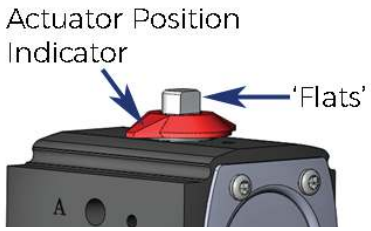
1. Confirm the ball valve to be mounted has the stem orientation line perpendicular to valve body for which the ball valve is in the closed position, Figure 1. If not rotate stem 90˚ using a wrench.

Figure 1



2. Confirm the red Actuator Position Indicator atop the actuator is perpendicular to Actuator Body, Figure 2. If it is not, rotate the Actuator Top Output Pinion (shaft) clockwise using a wrench on the 'flats'.

Figure 2

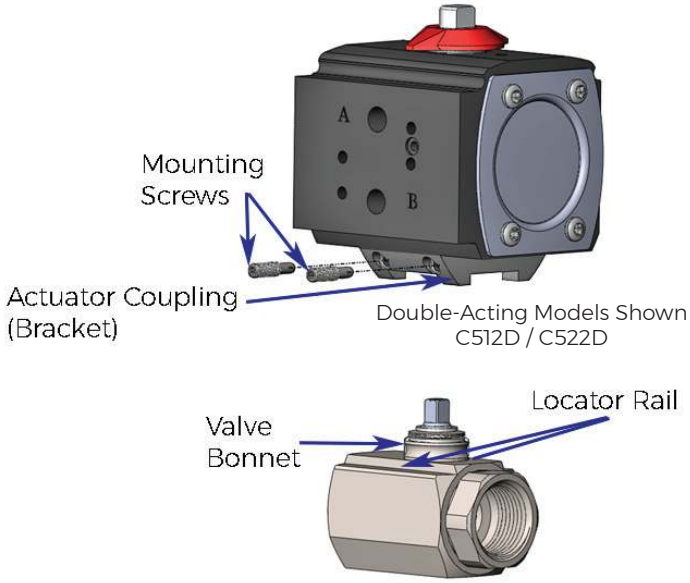


3. If not already in this state, back the (2) 3/32 Mounting Screws out of the actuator by turning them counter-clockwise. It is not necessary to remove them completely but sufficiently enough to enable the actuator coupling (bracket) to seat fully on the ball valve locator rail, Figure 3.

4. Place the actuator atop the ball valve so that the ball valve and actuator body axis are parallel (in-line) with each other, Figure 3.

5. Tighten the (2) 3/32 Mounting Screws by turning them clockwise by hand until snug. Care should be taken not to over-tighten. When the Mounting Screws are tightened they engage the valve bonnet pulling the valve into the actuator and locking it in place, Figure 3.

Figure 3



Optional Cross Mounting

Standard build Double-Acting models can be cross mounted for both Normally Closed and Normally Open operation. Standard build Spring-Return Actuators can be cross mounted for Normally Open operation only. If cross mounted Normally Closed is desirable purchase of model C512NOSR / C522NOSR, C512NOSR5 / C522NOSR5 is required.

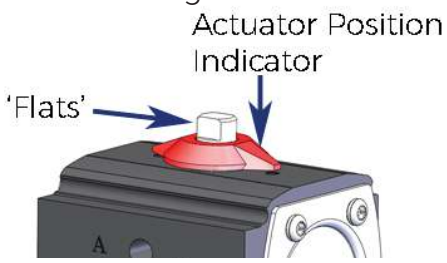
Normally Closed Operation (Double-Acting only)

1. Confirm the ball valve to be mounted has the stem orientation line perpendicular to valve body for which the ball valve is in the closed position, Figure 1. If not rotate stem 90˚ using a wrench.

Installation (continued)

2. Confirm the red Actuator Position Indicator atop the actuator is parallel to Actuator Body, Figure 4. If not, rotate the Actuator Top Output Pinion (shaft) counter-clockwise using a wrench on the 'flats'.

Figure 4

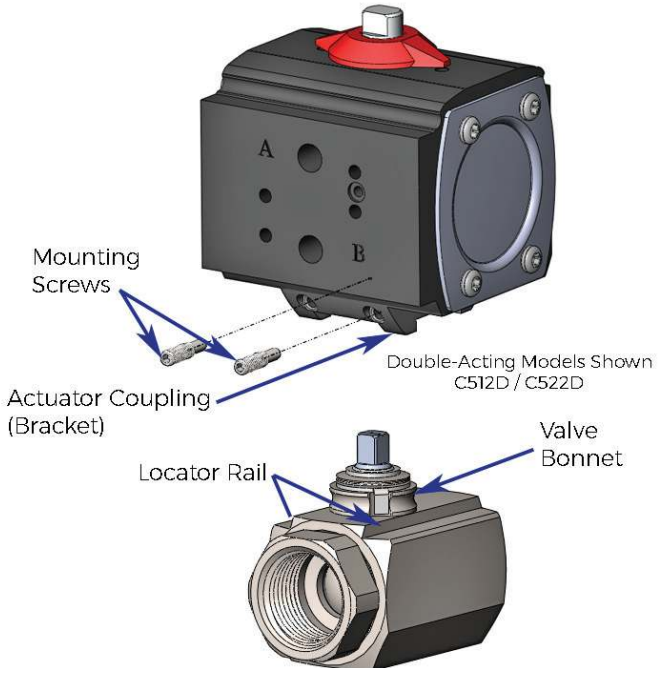


3. If not already in this state, back the (2) 3/32 Mounting Screws out of the actuator by turning them counter-clockwise. It is not necessary to remove them completely but sufficiently enough to enable the actuator coupling (bracket) to seat fully on the ball valve locator rail, Figure 5.

4. Place the actuator atop the ball valve so that the ball valve and actuator body axis are perpendicular (cross mounted)to each other, Figure 5.

5. Tighten the (2) 3/32 Mounting Screws by turning them clockwise by hand until snug. Care should be taken not to over-tighten. When the Mounting Screws are tightened they engage the valve bonnet pulling the valve into the actuator and locking it in place, Figure 5.

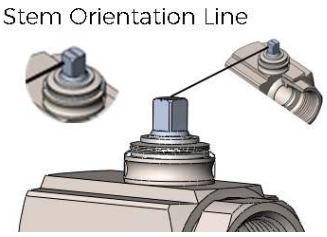
Figure 5



Normally Open Operation

1. Confirm the ball valve to be mounted has the stem orientation line parallel to valve body for which the ball valve is in the open position, Figure 6. If not rotate stem 90° using a wrench.

Figure 6



2. Confirm the red Actuator Position Indicator atop the actuator is perpendicular to Actuator Body, Figure 2. If it is not, rotate the Actuator Top Output Pinion (shaft) clockwise using a wrench on the 'flats'.

3. If not already in this state, back the (2) 3/32 Mounting Screws out of the actuator by turning them counter-clockwise. It is not necessary to remove them completely but sufficiently enough to enable the actuator coupling (bracket) to seat fully on the ball valve locator rail, Figure 7.

4. Place the actuator atop the ball valve so that the ball valve and actuator body axis are perpendicular (cross mount) to each other, Figure 7.

5. Tighten the (2) 3/32 Mounting Screws by turning them clockwise by hand until snug. Care should be taken not to over-tighten. When the Mounting Screws are tightened they engage the valve bonnet pulling the valve into the actuator and locking it in place, Figure 7.

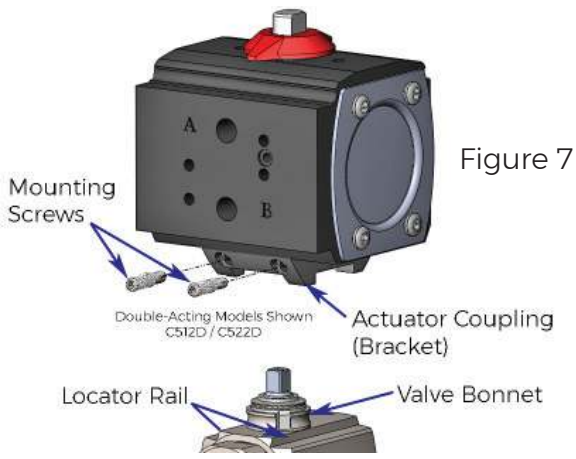


Figure 7

Specifications

TEMPERATURE: -20˚ F to 350˚ F

CYCLE (INDEX) TIME: Approximately 1/2-1 Second (Load Dependent)

AIR SUPPLY: 60 - 125 P.S.I. Sufficient air delivery must be available at the actuator to ensure dependable operation. The following precautions should be observed: Air supply should be clean and free of moisture. When dirty or wet air is a problem; a filter / separator should be specified; these units are most effective when installed as close as possible to the actuator. A filter, when used, should permit a minimum flow of 4 scfm at an upstream pressure of 60 P.S.I. Eliminate severe restrictions to air flow (certain solenoid valves & fittings). The most restricted passage must have an area no smaller than .012 inches square, the area of 1/8" diameter orifice. If more than a single actuator is to be supplied by an individual pilot, the minimum passage requirement applies per actuator. All actuator models are permanently lubricated and are not recommended to be used with any other air supply lubricants.

TUBING: For short runs up to 5 feet 5/32" I.D. is suitable, 1/4" I.D. will serve up to 30 feet. For longer runs, use 3/8" I.D. or larger.

AIR CONNECTIONS: Female 1/8" NPT / NAMUR Interface

MATERIALS:

BODY - Aluminum with Teflon ® Impregnated Hard Anodized (PolyLube®) Surfaces
EXTERNAL HARDWARE - (Pinion Shaft, Driver, End Caps) 300 Series Stainless Steel
SPRING MODULES-Aluminum with Teflon® Impregnated Hard Anodized (PolyLube®) Surfaces, 300 Stainless Hardware
EXTERNAL TRIM - 300 Series Stainless Steel

Operation

Double-Acting Models C512D / C522D

Use air to move the internal pistons in two directions which rotates the actuator pinion 90˚ which is attached to the ball valve stem. Air supplied to port 'A' causes counter clockwise rotation which with a normally closed assembly opens the ball valve. Air supplied to port 'B' causes clockwise rotation which in turn closes the ball valve. For most applications a four-way solenoid valve like the Gemini model 4GP, is used to pilot the air. Remote piloting can also be achieved utilizing the 'A' & "B' air supply ports. In summary the solenoid (pilot) valve uses an electric signal to cycle air in and out of the pneumatic actuator subsequently opening / closing the ball valve.

Double-Acting with Fail Safe Feature Models C512SR5 / C522SR5

Use air to move the internal pistons in two directions which rotate the actuator pinion 90˚ which is attached to the ball valve stem. These models come standard with Gemini's 5GP Direct Mount NAMUR Pilot (Solenoid) Valves. Air supplied to the pilot valve causes the internal actuator springs to compress (energize). Upon supply of voltage to the pilot valve coil air is cycled into the actuator and moves the internal pistons which causes counter-clockwise rotation of the actuator pinion in turn opening the ball valve. When voltage is removed from the pilot valve coil air is cycled in the opposite direction which move the internal pistons causing clock-wise rotation of the actuator pinion in turn closing the ball valve. If at any time the air supply is lost the internal actuator springs will de-energize and close the ball valve if not already in that position. This operation is based upon a normally closed actuated ball valve assembly.

Specifications (continued)

Spring-Return Models C512SR / C522SR

Use air to move the internal pistons in one direction and springs in the others which rotates the actuator pinion 90°. Air supplied to port 'A' causes counter clockwise rotation, which on a normally closed assembly, opens the ball valve. Upon release of air, springs cause clockwise rotation which closes the ball valve. For most applications a three-way solenoid valve like the Gemini model 3GP is used to pilot the air. Remote piloting can also be achieved utilizing the 'A' air supply port. In summary the solenoid (pilot) valve uses an electric signal to cycle air in and out of the pneumatic actuator subsequently opening / closing the ball valve.

Maintenance

Gemini's pneumatic actuators are engineered to be maintenance free. No adjustments or maintenance is required to achieve maximum service life. Care must be taken to ensure a clean / dry air supply is provided per the above AIR SUPPLY recommendations.

Installation

These instructions describe the operation and installation of the 3-way (3GP) and 4-way (4GP) Gemini pilot (solenoid) valves. The 3GP pilot valve is used with spring-return actuators. The 4GP pilot valve is used with double acting actuators.

Our GP Solenoid Valve is commonly referred to as a pilot valve in that it controls the air supply via means of an electrical signal. With a normally closed assembly, when the coil on the GP is energized, air is supplied into the actuator causing it to cycle / open the ball valve. When the coil is de-energized the actuator cycles again to close the ball valve.

3GP - Spring Return Models

Installation Normally Closed Operation. Valve is in closed position when coil is de-energized. Figure 1.

1. If equipped, remove the 1/8" exhaust filter from actuator port marked 'B'.

2. Fit the two o-ring seals into the pockets on the underside of the pilot valve body.

3. Position the pilot valve so that the Exhaust Ports are located on the same side as the Position Indicator.

4. Insert the mounting screws (M5X32) through the mounting holes in the pilot body valve and tighten until secure.

5. Connect the air supply (50 - 125 P.S.I.) to the 1/4" NPT inlet port and wire for the voltage marked on the coil.

6. GP coil is usually equipped with a 'DS' DIN x Strain (Figure 2.) or 'DC' DIN x Conduit electrical connector. To wire the connector, remove the center mounting screw and, with a small screwdriver, pry the inner element from the body of the connector to expose the terminal blocks inside. Route the wire through the hub of the connector. For the 'DS' loosen the sealing nut and ensure the wire insulation passes through the rubber grommet inside the hub. Affix the wires to the appropriate terminal block. Re-tighten sealing nut to secure the wire and provide a seal.

Installation - Normally Open Operation Valve in open position when coil is de-energized.

For Normally Open operation the purchase of a normally open actuator is suggested i.e. A512NOSR & A522NOSR. These models have the internal components assembled so that the actuator position indicator reflects the correct position of the valve. Field retrofit is not suggested and will void warranty.

For those applications where the actuator position indication is not required, remove the red position indicator and install the ball valve in the open position and mount the pilot valve as per Normally Closed Operation.

Figure 1

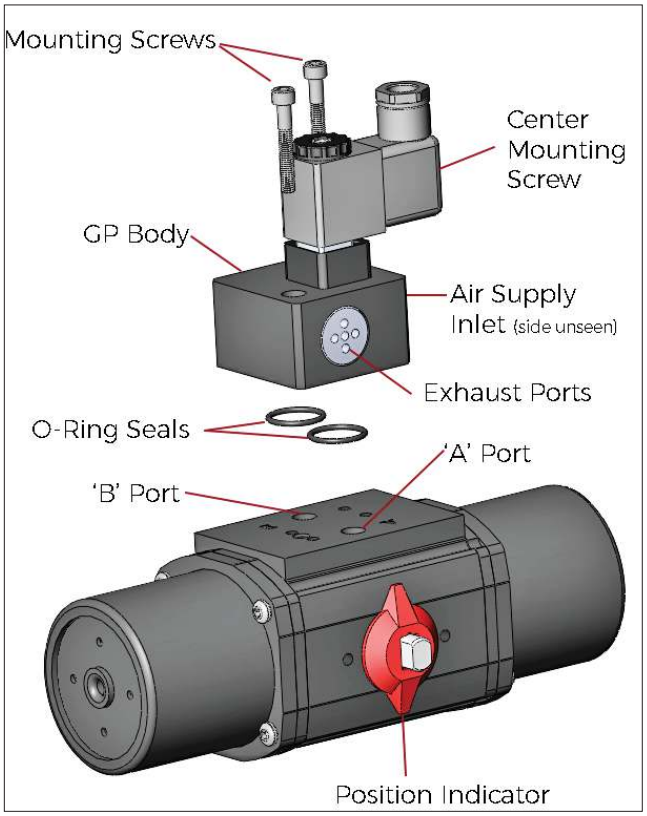


Figure 2

Installation (continued)

4GP - Double Acting Models

Installation - Normally Closed Operation. Valve in closed position when coil is de-energized. Figure 3.

1. Fit the two o-ring seals into the pockets on the underside of the pilot valve body.

2. Install the orientation screw (M5X10) into the hole on the actuator mounting pad directly beneath the letter 'A' identified as 'Normally Closed' in Figure 3, leaving 1/16" - 1/8" of the screw protruding above the surface of the mounting face.

3. Position the pilot valve so that actuator orientation screw fits into the shallow drilled hole in the GP body. Nameplate on Pilot Valve Body should face opposite Position Indicator.

4. Insert the mounting screws (M5X35) through the mounting holes in the pilot body valve and tighten until secure.

5. Connect the air supply (60 - 125 P.S.I.) to the 1/4" NPT inlet port and wire for the voltage marked on the coil.

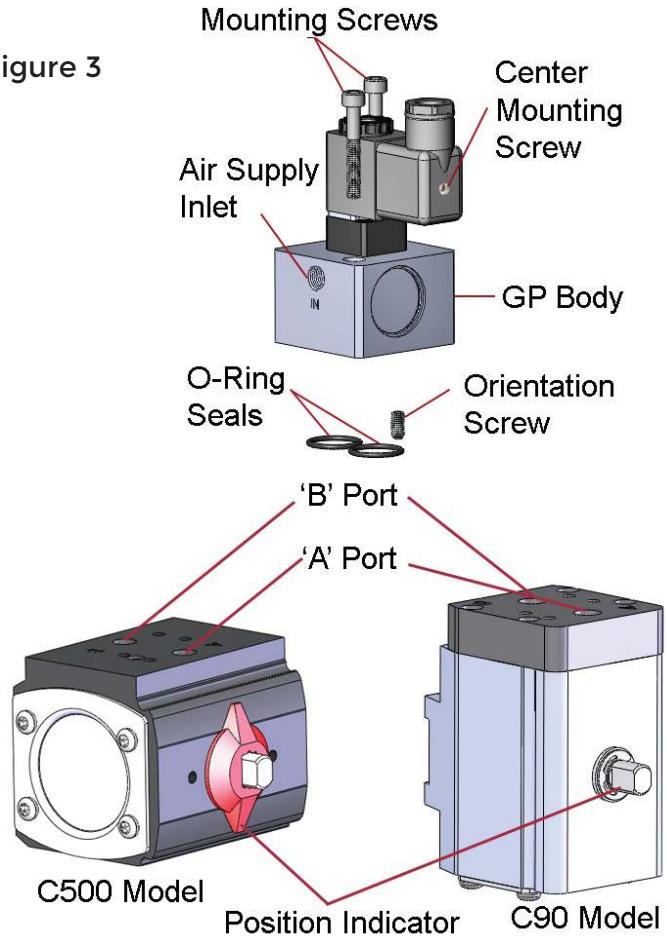
6. GP coil is usually equipped with a 'DS' DIN x Strain, Figure 2., or 'DC' DIN x Conduit electrical connector. To wire the connector, remove the center mounting screw and, with a small screwdriver, pry the inner element from the body of the connector to expose the terminal blocks inside. Route the wire through the hub of the connector. For the 'DS' loosen the sealing nut and ensure the wire insulation passes through the rubber grommet inside the hub. Affix the wires to the appropriate terminal block. Retighten sealing nut to secure the wire and provide a seal.

Installation - Normally Open Operation. Valve in open position when coil is de-energized.

Follow the same instructions for Normally Closed substituting item 2 as follows;

2. Install the orientation screw (M5X10) into the actuator mounting pad directly beneath the letter 'B' hole identified as 'Normally Open' in figure 1. Leave 1/16" - 1/8" of the screw protruding above the surface of the end cap.

Figure 3



Pneumatic Actuator Accessory - Solenoid Model GP

Specifications

TEMPERATURE: -20˚ F to 350˚ F

AIR SUPPLY: 60 - 125 P.S.I. Sufficient air delivery must be available at the actuator to ensure dependable operation. The following precautions should be observed: Air supply should be clean and free of moisture. When dirty or wet air is a problem; a filter / separator should be specified; these units are most effective when installed as close as possible to the actuator. A filter, when used, should permit a minimum flow of 4 scfm at an upstream pressure of 60 P.S.I. Eliminate severe restrictions to air flow (certain solenoid valves & fittings). The most restricted passage must have an area no smaller than .012 inches square, the area of 1/8" diameter orifice. If more than a single actuator is to be supplied by an individual pilot, the minimum passage requirement applies per actuator. All actuator models are permanently lubricated and are not recommended to be used with any other air supply lubricants.

TUBING: For short runs up to 5 feet 5/32" I.D. is suitable, 1/4" I.D. will serve up to 30 feet. For longer runs, use 3/8" I.D. or larger.

AIR CONNECTION: Female 1/4" NPT

OPERATING COIL: Operating coil technical data is dependent on the specific model selected, however, all standard coils as designated by the 'SC' code and conform to the following:

Wattage: 5 Watts
Class: F, continuous duty
Protection: IP65 (with connector) dusttight, water resistant, Connection: Mini-DIN Standard

MATERIALS:
BODY - PTFE / Anodized Aluminum
SPOOL - 18-8 Stainless Steel
SEALS - Nitrile / Viton®
HARDWARE - 18-8 Stainless Steel
COIL / BODY - GF Nylon / GF Zytel

Maintenance

Gemini's model GP Solenoid Valves are engineered to be maintenance free. No adjustments or maintenance is required to achieve maximum service life. Care must be taken to ensure a clean / dry air supply is provided per the above AIR SUPPLY recommendations.

Installation

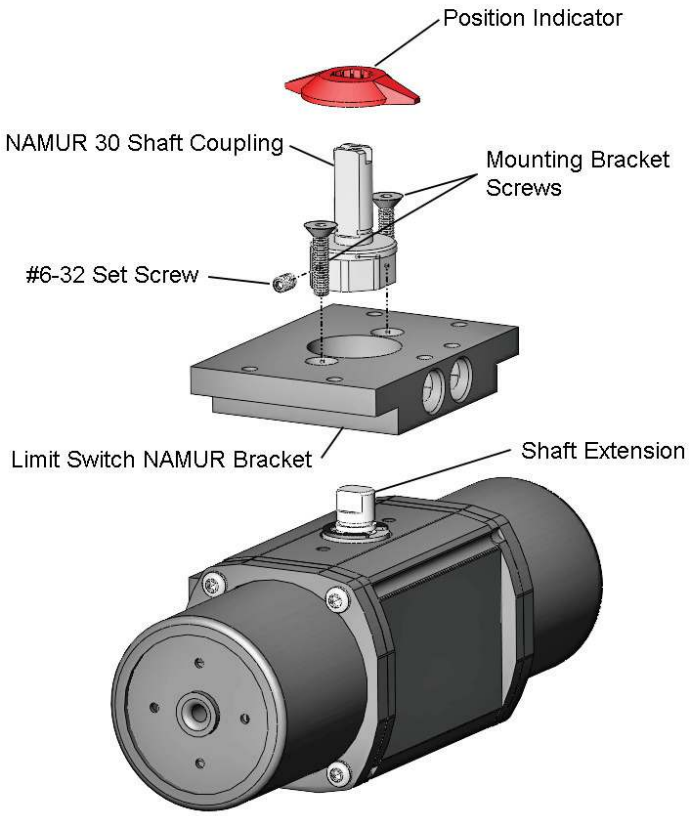
Attachment of Limit Switch NAMUR Mounting Bracket

1. Remove the position indicator from atop the actuator and secure the NAMUR 30 Shaft Coupling to the model A500 Actuator Shaft Extension with the #6-32 Set Screw using a medium strength, non-permanent thread locker user supplied.

2. Place the Limit Switch NAMUR Mounting Bracket on top of the actuator.

3. Fasten the Limit Switch NAMUR Mounting Bracket to the actuator using (2) Mounting Bracket Screws.

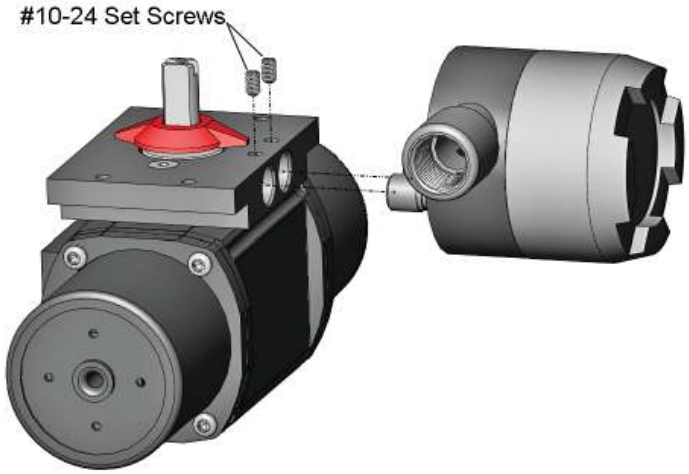
4. Slide the position indicator over the NAMUR 30 Shaft Coupling until it 'snaps' into place just above the bracket.



(Spring-Return Actuator Model Shown)

Attachment of Limit Switch

1. Fit the bushings, which extend from the Limit Switch housing, into the matching holes in the mounting pad. Push switch housing against pad and verify that switch body touches pad. Secure switch body to pad with two #10-24 setscrews using a medium strength, non-permanent thread locker user supplied.



Note: Hex wrench supplied with Gemini Limit Switch Mounting Kits, LSNM-A510-K and LSNM-A520-K.

Wiring

Wiring Specifications

Wire Size
#12 AWG Maximum
#24 AWG Minimum

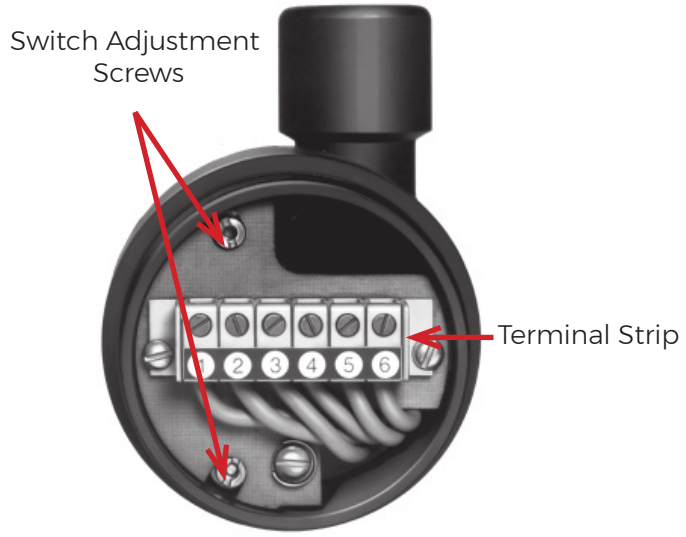
Wiring

1. Route the wire to be terminated through the conduit hub and up through the access space to the terminal block.

2. Strip insulation back 1/4", insert the stripped ends directly into the proper terminal clamps and tighten screws.

3. Internal interconnections between terminal-block and switches, Figure 1. A copy is also inside the Limit Switch Cover.

NOTE: If the Switch is installed in a hazardous location i.e. where flammable vapors or dust are present in the atmosphere, replace the cover and tighten securely before connecting the electrical supply circuit. If necessary, a screwdriver shank or similar tool may be engaged in the cover wrenching lugs to assist removal and replacement.



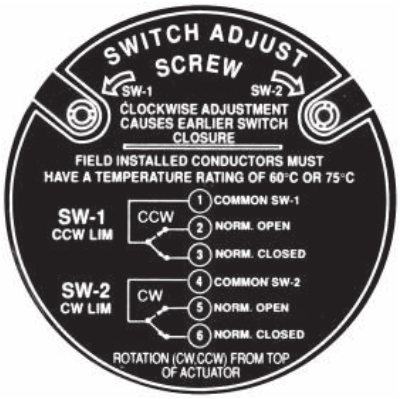


Figure 1

Specifications

MATERIALS:
Body / Cover - Aluminum with Teflon® Impregnated Hard Anodized (PolyLube®) Surfaces
Probes - 316 Stainless Steel
Cover Seal / Probes - Buna N

TEMPERATURE: 10° F to 180° F

CONDUIT CONNECTION: 1/2" NPT

ELECTRICAL RATING: 10 amp. 250VAC maximum; 1/2 amp. 125VDC; 1/4 amp. 250VDC; 5 amp. 125VAC lamp load. Note: each pole must be the same polarity to utilize these ratings.

MICROSWITCHES: Mechanical S.P.D.T. (Single Pole Double Throw)

INTERNAL WIRING CONNECTORS: Screw Clamp

NEMA STANDARDS: NEMA 1 (General Purpose); NEMA 4 (Watertight & Dusttight); NEMA 7 (Hazardous Locations, Class I Groups B, C, & D); NEMA 9 (Hazardous Locations, Class II, Groups E, F, & G); NEMA 12 (Oiltight and Driptight); and NEMA 13 (Oiltight and Dusttight).

UL® LISTINGS: Industrial Control Equipment for use in Hazardous Locations, Class I, Groups B,C, & D and Class II, Groups E, F, & G

Maintenance

Gemini's model LS-1 Limit Switch is engineered to be maintenance free.

Installation

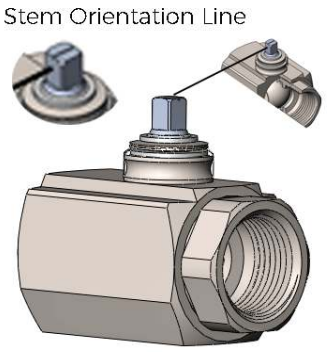
Gemini's Performance Automation ball valves feature a unique valve to actuator coupling design. The ball valve has a precisely machined locating bonnet which when combined with mating actuator gland, ensures alignment and rigidity. This eliminates stem side loading which results in premature stem seal leakage.

These instructions detail the procedure for mounting Model WDM24DM12 on a Model 87 Ball Valve.

Standard Mounting: In-line

1. Confirm the ball valve to be mounted has the stem orientation line perpendicular to valve body for which the ball valve is in the closed position, Figure 1. If not rotate stem 90° using a wrench.

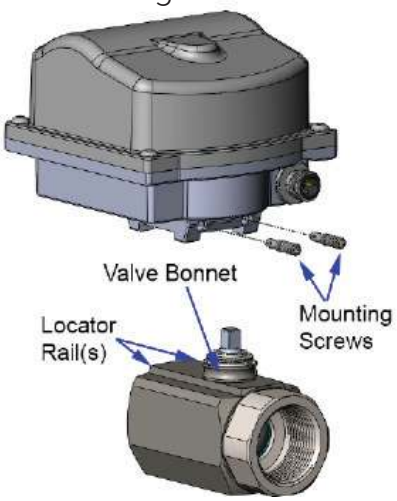
Figure 1



2. If not already in this state, back the (2) 3/32 Mounting Screws out of the actuator by turning them counter-clockwise. It is not necessary to remove them completely but sufficiently enough to enable the actuator coupling (bracket) to seat fully on the ball valve locator rail, Figure 2.

4. Place the actuator atop the ball valve so that the ball valve and actuator body axis are parallel (in-line) with each other, Figure 2.

Figure 2



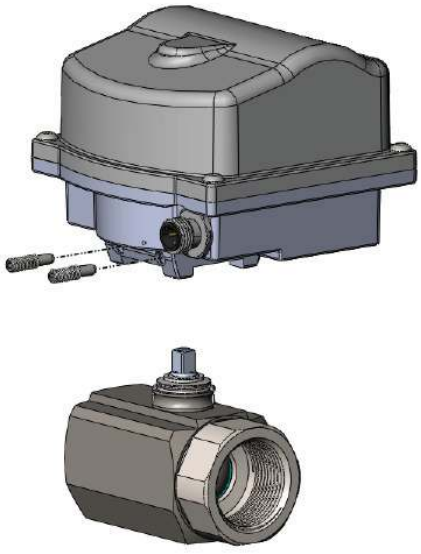
5. Tighten the two (3/32) Mounting Screws by turning them clockwise by hand until snug. Care should be taken not to over-tighten. When the Mounting Screws are tightened they engage the valve bonnet pulling the valve into the actuator and locking it in place, Figure 2.

Optional: Cross Mounting

Follow the Instructions for Standard Mounting: In-line substituting Item 4 as follows.

4. Place the actuator atop the ball valve so that the ball valve and actuator body axis are parallel (in-line) with each other, Figure 3.

Figure 3



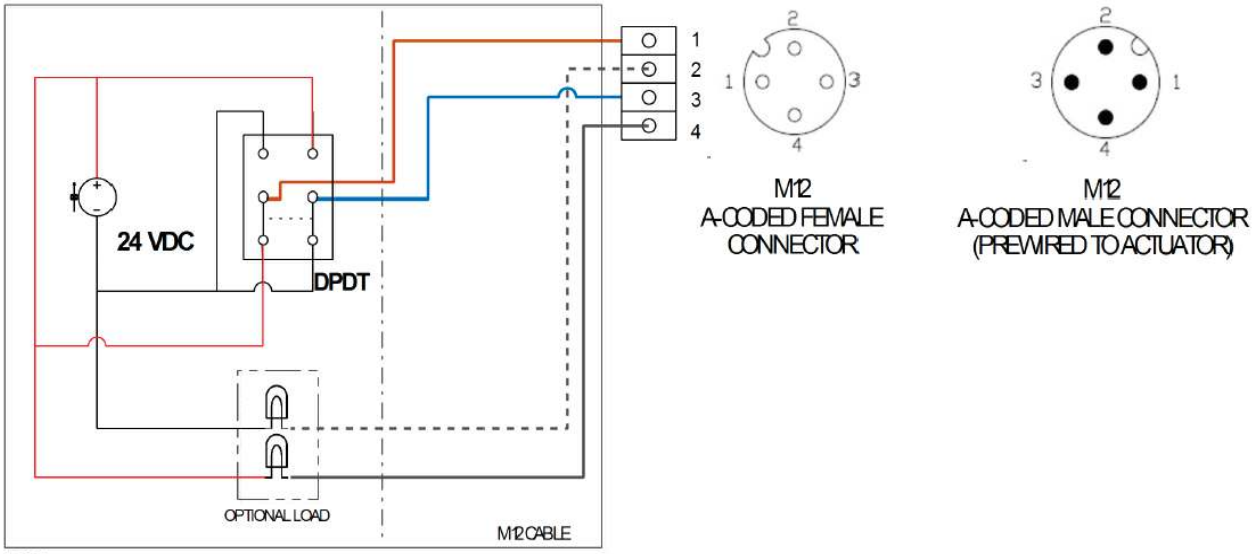
Electric Actuator Models WDM24DM12

Specifications

TEMPERATURE: 40˚F to 221˚F

MOTOR: 24VDC
CURRENT (AMPS): Start 2.4, Running 1.2 SUGGESTED WIRE GAUGE; 20AWG
DUTY CYCLE: 25%
CYCLE (INDEX) TIME: 2 Seconds (approximate - ——load dependent)
ENCLOSURE: General Purpose (non-NEMA rated)
ELECTRICAL LEADS: 24" (optional lengths and electrical terminations available upon request)
MATERIALS:
BODY: Coated Aluminum Die Cast Base
ENCLOSURE: Zytel
TRIM: (Output Shaft / Mounting Hardware): 300 Series Stainless Steel
WIRING DIAGRAM:

WIRE/CONNECTOR: M12 A-CODED CIRCULAR CONNECTOR
ACTUATION: POLARITY REVERSING
FEEDBACK: STANDARD



FIELD WIRING

NOTES:
ACTUATOR SHOWN IN CLOSED POSITION.
DASHED LINES REPRESENTS WHITE COLORED LINE.

M12 PIN	STANDARD M12 WIRE COLOR	INPUT/FEEDBACK	CLOSED	CLOSING	OPEN	OPENING
1	BROWN	MOTOR POWER INPUT	+24 VDC	+24 VDC	0 VDC	0 VDC
2	WHITE	FEEDBACK (OPTIONAL)	+24 VDC	OPEN	OPEN	OPEN
3	BLUE	MOTOR POWER INPUT	0 VDC	0 VDC	+24 VDC	+24 VDC
4	BLACK	FEEDBACK (OPTIONAL)	OPEN	OPEN	0 VDC	OPEN

FEEDBACK/OPTIONAL LOAD:
ACTUATOR CLOSED: 24VDC CAN BE MEASURED ACROSS BLUE (M12, PIN 3) AND WHITE (M12, PIN 2).
ACTUATOR OPEN: 24VDC CAN BE MEASURED ACROSS BLUE (M12, PIN 3) AND BLACK (M12, PIN 4).
THE FEEDBACK SIGNAL SHOULD ONLY BE USED FOR MEASUREMENTS OR RUNNING SMALL NON CAPACITIVE LOADS, SUCH AS LEDS, RELAYS SOLENOIDS, IO MODULES, OR SIGNAL LOGIC. IF THE FEEDBACK IS USED TO RUN MORE THAN A SMALL LOAD, THE ACTUATOR MOTOR MAY CONTINUE TO ROTATE PAST THE OPEN AND CLOSED INDEX POSITIONS.

Maintenance

Gemini's model WD2402 Electric Actuators are engineered to be maintenance free. No adjustments or maintenance is required to achieve maximum service life.

Installation

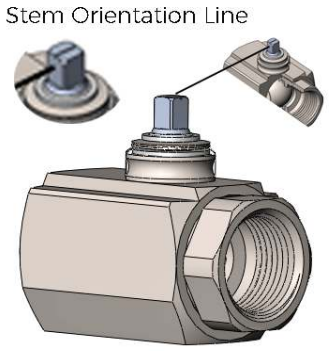
Gemini's Performance Automation ball valves feature a unique valve to actuator coupling design. The ball valve has a precisely machined locating bonnet which when combined with mating actuator gland, ensures alignment and rigidity. This eliminates stem side loading which results in premature stem seal leakage.

These instructions detail the procedure for mounting Gemini Model WD2402 on a Model 87 Ball Valve.

Standard Mounting: In-line

1. Confirm the ball valve to be mounted has the stem orientation line perpendicular to valve body for which the ball valve is in the closed position, Figure 1. If not rotate stem 90° using a wrench.

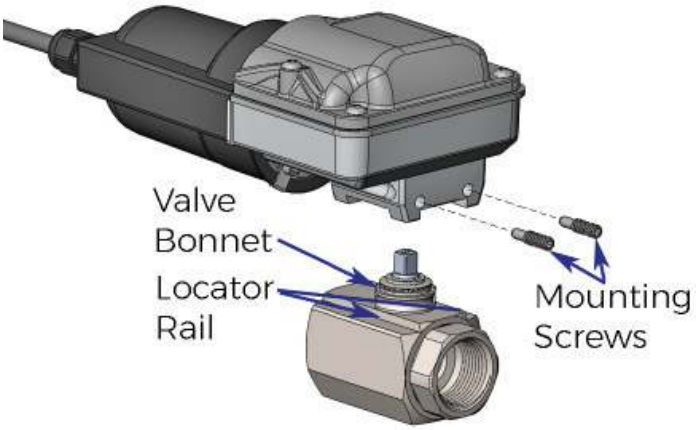
Figure 1



2. If not already in this state, back the (2) 3/32 Mounting Screws out of the actuator by turning them counter-clockwise. It is not necessary to remove them completely but sufficiently enough to enable the actuator coupling (bracket) to seat fully on the ball valve locator rail, Figure 2.

4. Place the actuator atop the ball valve so that the ball valve and actuator body axis are parallel (in-line) with each other, Figure 2.

Figure 2



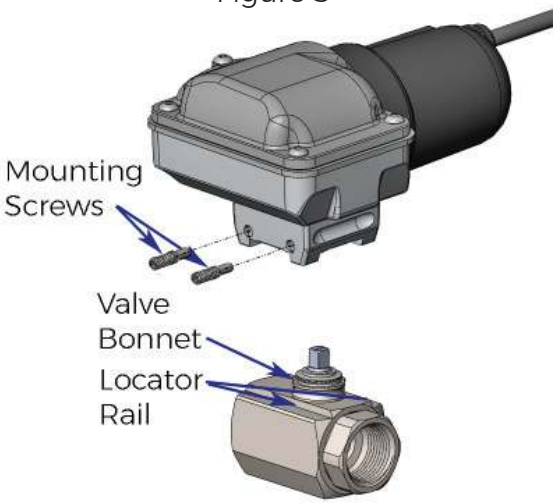
5. Tighten the two (3/32) Mounting Screws by turning them clockwise by hand until snug. Care should be taken not to over-tighten. When the Mounting Screws are tightened they engage the valve bonnet pulling the valve into the actuator and locking it in place, Figure 2.

Optional: Cross Mounting

Follow the Instructions for Standard Mounting: In-line substituting Item 4 as follows.

4. Place the actuator atop the ball valve so that the ball valve and actuator body axis are parallel (in-line) with each other, Figure 3.

Figure 3



Electric Actuator Models WD2402

Specifications

TEMPERATURE: 40˚F to 221˚F

MOTOR: 24VDC
NOTE: Optional 12VDC Available Upon Request. Subject to minimum purchase quantities.

CURRENT (AMPS): Start 2.4, Running 1.2

DUTY CYCLE: 25%

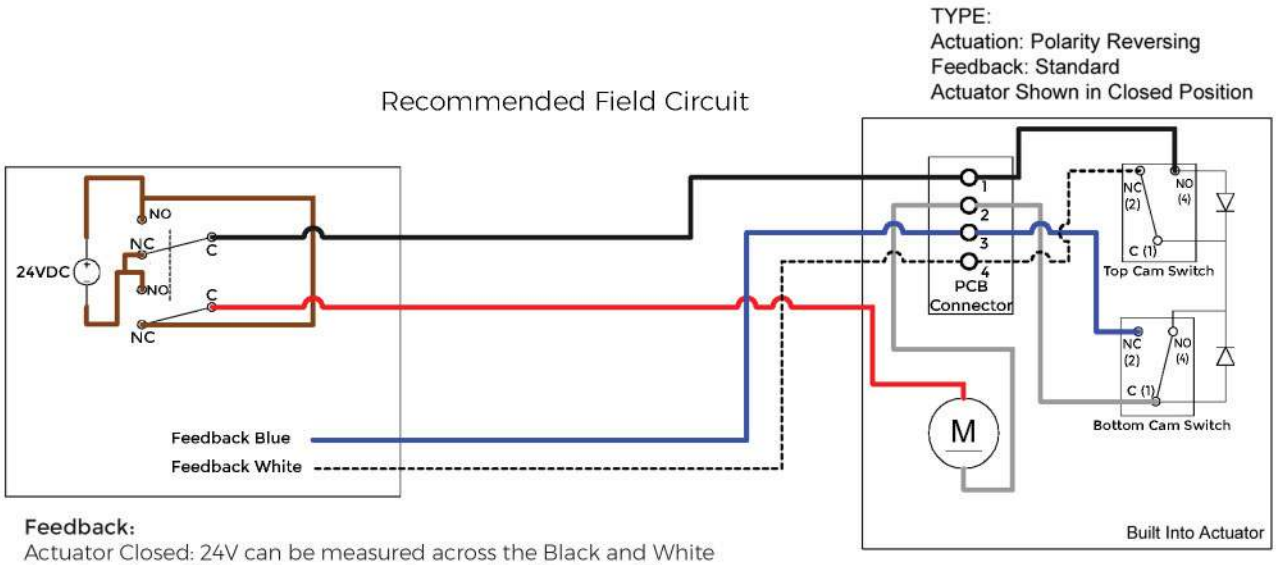
CYCLE (INDEX) TIME: 1.5 Seconds (load dependent)

ENCLOSURE: General Purpose (non-NEMA rated)

ELECTRICAL LEADS: 24" (optional lengths and electrical terminations available upon request)

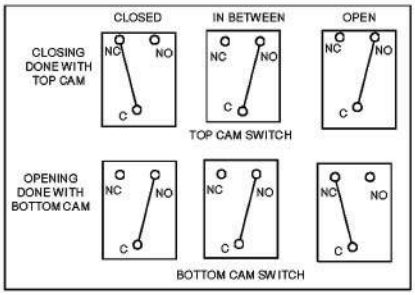
MATERIALS:
BODY: Coated Aluminum Die Cast Base
ENCLOSURE: Zytel
TRIM: (Output Shaft / Mounting Hardware): 300 Series Stainless Steel

WIRING DIAGRAM:



Feedback:
Actuator Closed: 24V can be measured across the Black and White
Actuator Open; 24V can be measured across the Black and Blue
The feedback signal should only be used for measurement, or running very small loads such as LEDs, Relays, IO Modules, or signal logic. If the feedback is used to run more than a small load, the actuator motor will continue to rotate past the Open and Closed stop positions.

Wire	Valve Closed	Valve Opening	Valve Open	Valve Closing
Black	0 VDC	+ 24VDC	+ 24VDC	0 VDC
Red	+ 24VDC	0 VDC	0 VDC	+ 24VDC
Blue	Open	Open	0 VDC	Open
White	+ 24VDC	Open	Open	Open



Maintenance

Gemini's model WD2402 Electric Actuators are engineered to be maintenance free. No adjustments or maintenance is required to achieve maximum service life.

Performance Engineered Automated Ball Valves

Designed and Tested, Manufactured and Assembled, Supplied
and Supported, Direct from USA Headquarters

All specifications herein are subject to change without notice or obligation.

Seller warrants its products for a period of one (1) year, to be manufactured in accordance with our written specifications and free from material defects in material and/or workmanship. Seller, at its option, will promptly repair or replace any products returned intact to the factory, transportation charges prepaid, which Seller determines to be defective in material and/or workmanship. The foregoing shall constitute the sole remedy for any breach of Seller's warranty. Care must be taken to assure that the internal media and external environment are compatible with the materials of the ball valve. For a complete copy of our Warranty please see our Standard Terms and Conditions at www.geminivalve.com

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