

READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLING OR CONNECTING COMPRESSED AIR OR ELECTRICAL POWER TO THE ACTUATOR. DAMAGE CAUSED BY NON COMPLIANCE WILL NOT BE COVERED BY WARRANTY

STORAGE

The actuator should be stored in a clean, dry environment within a temperature range of 32 to 104° F (0 to 40° C).

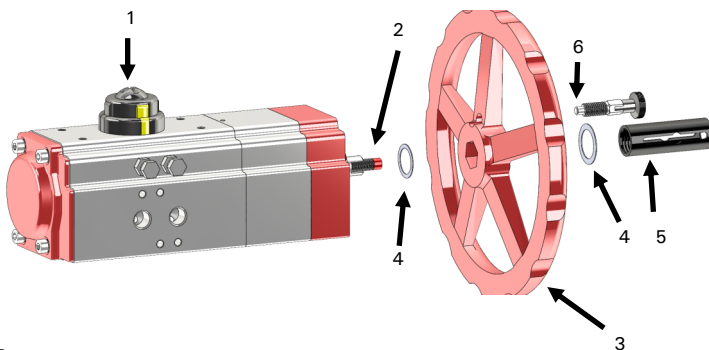
INTRODUCTION

This document provides installation, operation and maintenance instructions for Valworx 5310/5311 series quarter turn double acting and spring return pneumatic actuators. These actuators are typically used to operate quarter turn valves or dampers. Every actuator has been fully tested prior to shipment to ensure trouble free operation.



ASSEMBLY

Caution! Ensure any compressed air is exhausted from the actuator prior to assembly.



Parts

1. Actuator
2. Handwheel Bushing (PTFE)
3. Handwheel
4. Washer (PTFE)
5. Indicator (Aluminum)
6. Détente Pin

Assembly

1. Slide the bushing onto the lead screw so it is flush with the actuator housing.
2. Fit the handwheel onto the lead screw so it rests on the bushing.
3. Slide the washer onto the lead screw so it is flush with the handwheel.
4. Thread the indicator onto the lead screw. Tighten to hand tight plus a quarter turn.
5. Thread the détente pin into the hand wheel. If desired, secure with Loctite or other thread adhesive.
6. Pull the détente pin and rotate the knob so it remains disengaged.
7. Rotate the handwheel until the indicator is in the "pneumatic actuation" position.
8. Re-engage the détente pin and rotate the handwheel so it locks in place.

The actuator is now ready for full stroke (0-90°) pneumatic operation. For stroke limit operation, refer to the OPERATION-STROKE LIMITED section.



MOUNTING

These rack & pinion air actuators can be mounted in any orientation, indoors or outdoors and feature a fully sealed corrosion resistant design. The valve mounting interface conforms to the international ISO5211 mounting standards.

The pipe must be adequately supported for manual operation.



ISO5211 Valve Mounting Pad

PILOT AIR SUPPLY

The pilot air supply should be filtered, dry or lubricated compressed air. Valworx air actuated valve assemblies require 29 to 120 PSI (2 to 8 Bar) for double acting and 87-120 PSI (6-8 Bar) pilot air for spring return. Pilot air ports 'A' and 'B' are 1/4" NPT.

Note: minimum recommended pressure for spring return is 87 PSI (6 Bar).

PRESSURE RATING

The 5310/5311 series air actuators have a maximum pressure rating of 120 PSI (8 Bar) continuous duty.

TEMPERATURE RATING

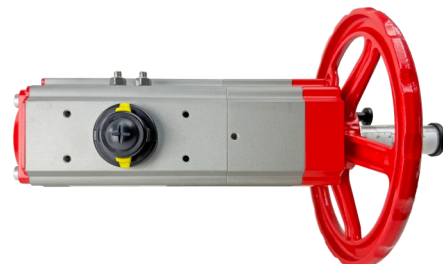
Actuator temperature rating is -4 to 176° F (-20 to 80° C). Heat from the working media (fluid) should not allow actuator to exceed these temperature limits. Optional high temperature valve mounting kits are available to increase the allowable media working temperature.

VISUAL VALVE POSITION INDICATOR

Actuators are supplied with a highly visual valve position indicator. The indicator is black with yellow pointers and indicates the open and closed (on/off) positions.

TOP MOUNTED ACCESSORIES

Valve monitors with position confirmation switches can be easily mounted to the top of the actuator using the standard VDI/VDE-3845 mounting interface.



Top Mounting Interface

Position Indicator Shown in Closed Position

OPERATION-AUTOMATIC

Double Acting (DA) Actuators

Air pressure supplied to port 'B' turns the output drive counter-clockwise 90° to OPEN the actuator (valve), exhaust air will exit through port 'A'.

Air pressure supplied to port 'A' turns the output drive clockwise and returns the actuator (valve) to the normal CLOSED position, exhaust air will exit port 'B'.

Spring Return (SR) Actuators

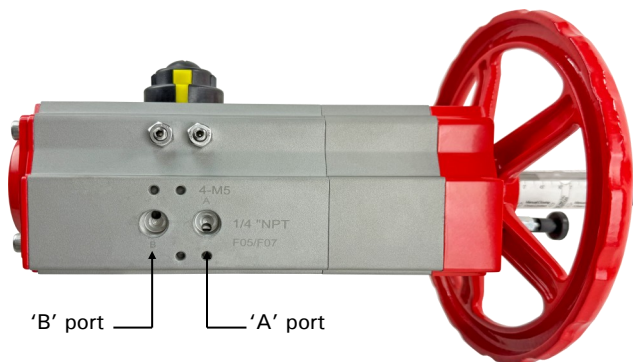
Air pressure supplied to port 'B' turns the output drive counter-clockwise 90° to OPEN the actuator (valve), exhaust air will exit through port 'B'.

"A" Port is used as vent and should not be obstructed.

Internal springs will return the actuator (valve) to the normal CLOSED failsafe position when air pressure is removed and exhausted from port 'B'.

Note: Open is often referred to as ON or POSITION 1 and closed referred to as OFF or POSITION 2. The rotation is viewed from the top of the actuator, looking down on the visual indicator.

DA or SR Actuators

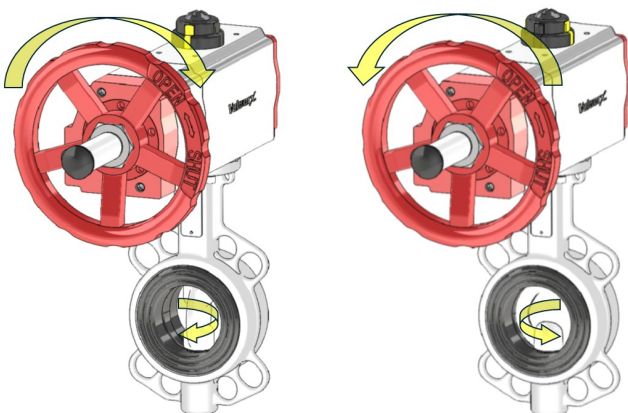


OPERATION- MANUAL



Caution! Prior to manual operation, ensure the actuator is not pressurized. Slightly loosen the indicator sleeve. After manual operation, re-tighten the indicator sleeve.

Manually operate the actuator by pulling the handwheel détente pin and rotating the knob so it remains disengaged. The handwheel may now be turned to the desired position.



TO CLOSE THE VALVE

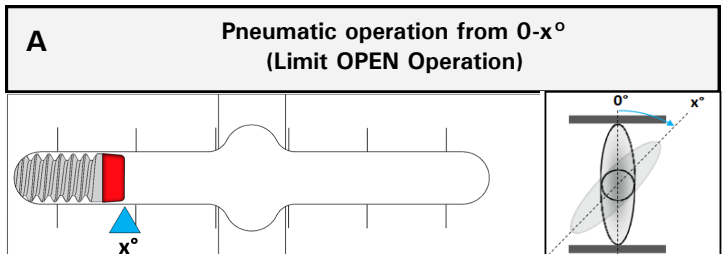
To close the valve, turn the handwheel clockwise

TO OPEN THE VALVE

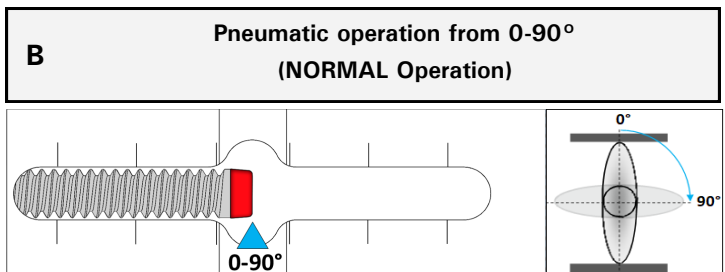
To open the valve, turn the handwheel counterclockwise

OPERATION-STROKE LIMITED

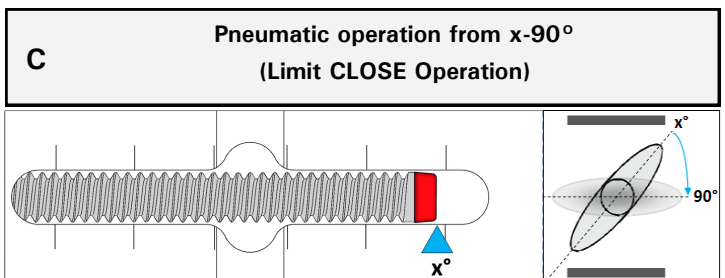
In addition to manual operation, the 5310/5311 combination actuator has three selectable working modes: NORMAL (0 – 90°), limit OPEN (0° – limit) and limit CLOSE (limit- 90°). The manual feature is used to set stroke limit by locking the handwheel in the desired position.



Supplying air pressure to port 'B' rotates the output drive clockwise to x°. Supplying air pressure to port 'A' rotates the output drive counter-clockwise to 0°. The stroke is therefore limited from 0 – x°.



Normal pneumatic operation (see description in Operation- Automatic)

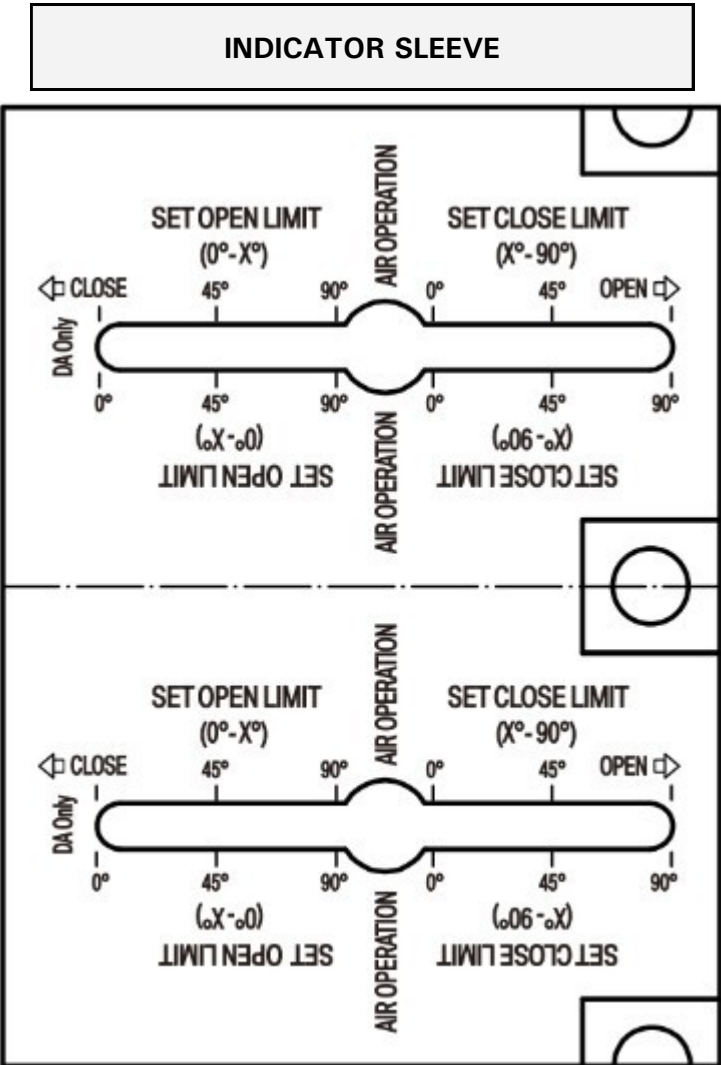


Supplying air pressure to port 'B' rotates the output drive clockwise to 90°. For DA actuators, supplying air pressure to port 'A' rotates the shaft counter-clockwise to x°. For SR actuators, springs rotate the output drive to x° when air pressure is removed from port 'B'. For both types, the stroke is therefore limited from x° – 90°.

The Valworx pneumatic/manual combination actuator uses a sliding clutch to engage/disengage the output drive. Depending on operation (opening or closing) and actuator type (DA or SR) the output drive will be disengaged over portion of the indicator range:

With the manual setting fully open or fully closed the actuator cannot be pneumatically operated and will remain in position.

NOTE: When used in Stroke Limited mode with a Valworx Digital Positioner (Series 5298) calibrated to full stroke, the 4-20mA signal range is inactive beyond the stroke limit. When calibrated to partial stroke, the full signal ranges over the partial stroke.



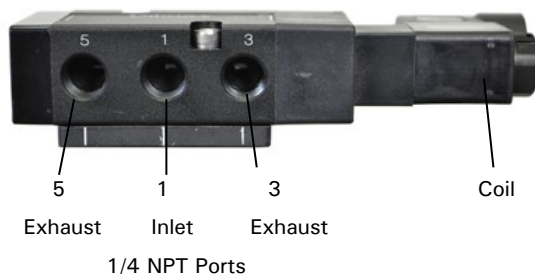
Actuators with Optional 5292 Series Direct Mount Solenoid Valves

PILOT AIR SUPPLY

Air supply to the solenoid valve should be filtered <40 micron, dry or lubricated compressed air. Most Valworx air actuated valve assemblies require 80-120 PSI (5.5-8 bar). Moisture free air is required below 32° F (0° C) to prevent freezing.

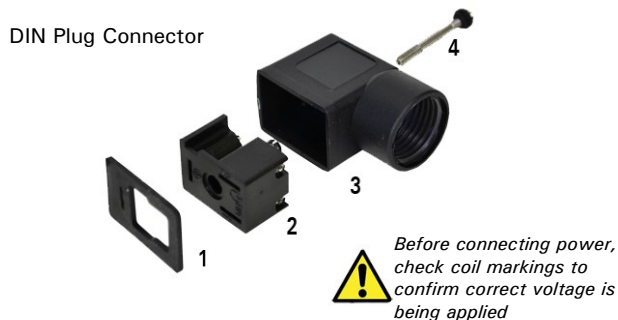
PILOT AIR CONNECTION

Connect air supply to the 1/4 NPT center port, marked 1. Optional mufflers or speed control mufflers can be installed in exhaust ports 3 and 5 to keep out dirt and contamination. Do not plug exhaust ports.



WIRING

Wiring must comply with all local and national electrical codes. Disassemble the DIN plug connector as shown in the diagram by removing retainer screw (4) and prying terminal block out with a small screw driver. Confirm coil voltage is correct and connect power wires to PIN 1 and PIN 2 (not polarity sensitive). Connect earth ground to the remaining flat PIN. Reassemble connector and plug onto coil, insure connector gasket (1) is installed and tighten retainer screw (4) securely.



OPERATION

Solenoid De-energized: When the solenoid is de-energized (power off) actuator will return to CLOSED position (also referred to as Off or Position 1).

Solenoid Energized: When the solenoid is energized (power on), the actuator will move to the OPEN position (also referred to as On or Position 2).

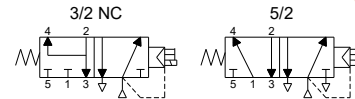
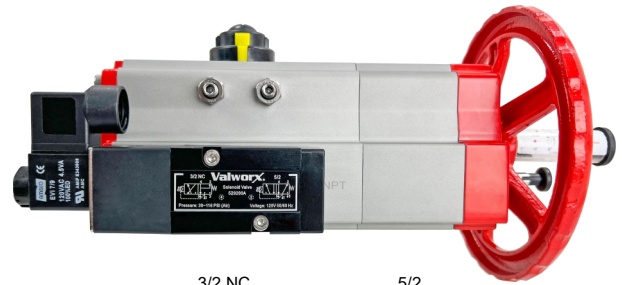
When using these solenoid valves with spring return (SR) actuators, the actuator will fail to the closed position with loss of power or loss of air pressure (failsafe). Most control valves can be setup to fail open upon request.

ENCLOSURE AND TEMPERATURE RATING

Solenoid enclosure is rated IP65 dusttight and weatherproof. Media temperature range -13 to 176° F (-25 to 80° C). Ambient temperature range -4 to 122° F (-20 to 50° C).

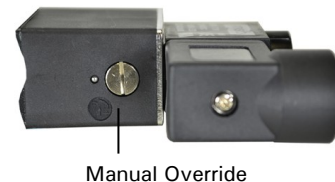
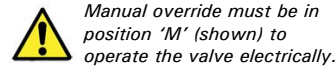
DUTY CYCLE

The solenoid valve coil is rated for 100% continuous duty service.



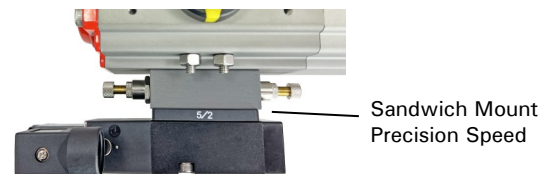
MANUAL OVERRIDE

The valve can be operated manually for setup, testing and situations where power is not available. The manual override is a twist and hold design. To operate the manual override, turn the slot head screw clockwise to the '1' position. Return to '0' position for normal electrical operation.

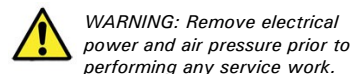
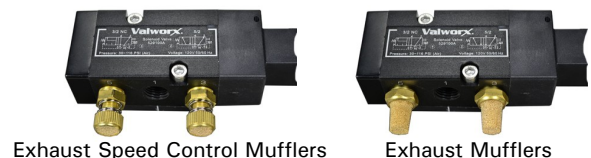


OPTIONAL SPEED CONTROL AND EXHAUST MUFFLERS

Precision speed controls: These sandwich mount speed controls are the most accurate method of controlling the speed of an air actuator. Easy micrometer adjustment of both the open and closed speed, for both double acting and spring return type actuators.



Exhaust speed controls and mufflers: Adjustable speed control mufflers will provide rough speed control of the air actuator and mufflers keep dirt out of the solenoid valve. With exhaust speed control of double acting actuators, both open and closed speed can be controlled. With spring return actuators, only the closing speed can be controlled (open speed cannot be fully controlled).



MAINTENANCE

Except for coil replacement, the series 5292 valves are not repairable. There are no parts that require regular maintenance. The valve may be cleaned with warm soapy water (no solvents). The valve should be cycled at least once per month.