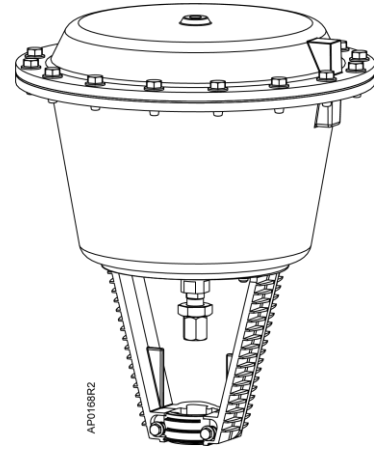


# Flowrite™ AP 599 Series

## 12-inch Pneumatic Valve Actuator



### Description

The Flowrite™ AP 599 Series 12-inch pneumatic valve actuator is designed for use with the Flowrite VF 599 Series valves. This actuator is available with two stem strokes.

### Features



- Completely enclosed actuator housing protects the diaphragm, springs, and start point adjuster.
- Positioning relay is available factory-mounted or as an accessory.
- Start point of the actuator spring is adjustable. This allows the valve to be sequenced.
- Easy installation.

### Product Numbers

Table 1.

| Product Number | Actuator              | Type   | Actuator Code |
|----------------|-----------------------|--|---------------|
| 599-01010      | 3/4" (20 mm) stroke   | Pneumatic  | 279           |
|                |                       | Pneumatic with Factory Mounted Positioning Relay | 285           |
| 599-01000      | 1-1/2" (40 mm) stroke | Pneumatic  | 281           |
|                |                       | Pneumatic with Factory Mounted Positioning Relay | 287           |

## Warning/Caution Notations

|                |   |   |
|----------------|---|---|
| <b>WARNING</b> |  | Personal injury or loss of life may occur if you not perform a procedure as specified.      |
| <b>CAUTION</b> |  | Equipment damage, or loss of data may occur if you do not perform a procedure as specified. |

|                       |   |  |
|-----------------------|---|--|
| <b>Specifications</b> | Effective diaphragm area                  | 90 inch <sup>2</sup> (580 cm <sup>2</sup> )                                      |
|                       | Diaphragm material                        | Buna-N   |
|                       | Nominal spring range                      |  |
|                       | Fixed span                                | 5 psi (34 kPa)   |
|                       | Adjustable start point                    | 3 to 10 psi (21 to 69 kPa)   |
|                       | Factory setting                           | 3 to 8 psig ( 21 to 55 kPa) NO valves<br>10 to 15 psig (69 to 103 kPa) NC valves |
|                       | Nominal stroke                            | 3/4 inch (20 mm)<br>1-1/2 inch (40 mm)   |
|                       | Maximum diaphragm pressure                | 35 psi (241 kPa)   |
|                       | Air Connection                            | 1/4-inch NPT   |
|                       | Medium temperature                        | 25 to 366°F (-4 to 186°C)  |
|                       | Ambient operating and storage temperature | 35 to 180°F (2 to 85°C)  |
|                       | Mounting location                         | NEMA 1 (interior only)   |
|                       | Dimensions                                | 17-7/8" H x 15-1/8" dia.<br>(454 mm H x 384 mm dia.)                             |
|                       | Shipping weight                           | 53 lb (24 kg)  |

**Application** These 12-inch actuators are designed to be used on Flowrite VF 599 Series valves in liquid service and steam service.

**Operation** The control air signal upon the diaphragm causes the valve to modulate whenever the air pressure is within the spring range of the actuator. The actuator springs provide the necessary force to hold the stem in the stem up (direct acting) position.

|                    |   |           |
|--------------------|---|-----------|
| <b>Accessories</b> | Stem Heater Element   | ASZ6.6    |
|                    | Positioning Relay and Mounting Kit  | 599-00423 |
|                    | Instructions for mounting are included with the accessory.  |           |
|                    | Spring Clamp (secures 1/4-inch O.D. poly tubing to barb-fitting at higher control pressures or elevated temperatures) | 531-833   |

|                                   |                              |           |
|-----------------------------------|------------------------------|-----------|
| <b>Service Kits</b>               | Retainer Bracket Kit         | 599-00436 |
|                                   | Diaphragm Replacement Kit    | 599-01070 |
|                                   | Stem retainer kit            |           |
|                                   | 2-1/2 inch and 3-inch valves | 599-10048 |
| 4-inch, 5-inch, and 6-inch valves | 599-10049                    |           |

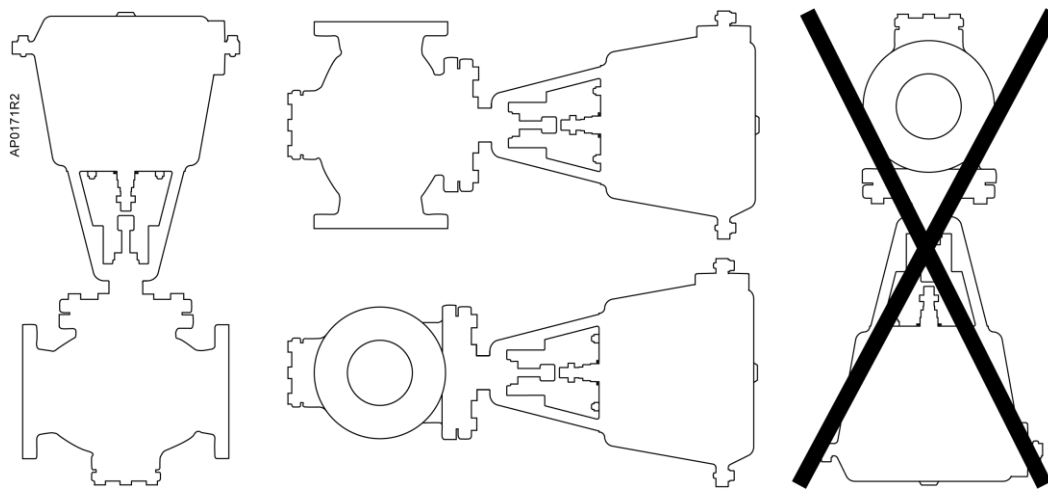
## Mounting and Installation

Allow 12 inches (300 mm) above and 6 inches (150 mm) on each side of the actuator for servicing.

For best performance, install the actuator vertically above the valve. The actuator may be installed in any position between vertical and horizontal. Siemens Building Technologies does not recommend installing the actuator below horizontal or upside down. See Figure 1 for acceptable mounting positions.

Complete instructions for field mounting the actuator are included with the actuator.

The top edge of the stem nut indicates the valve stem position. The “0” marking on the actuator yoke indicates stem up position. The “1” mark indicates stem down position. See Figure 3.



**Figure 1. Acceptable Mounting Positions.**

**Table 2. Parts List. See Figure 2.**

| Item  | Description                       | Qty | Material                     |
|---|-----------------------------------|-----|------------------------------|
| 1   | 3/8-16 thread forming screw       | 16  | Plated Steel                 |
| 2   | Upper housing                     | 1   | Aluminum                     |
| 3   | Diaphragm                         | 1   | Buna-N                       |
| 4   | Piston plate                      | 1   | Aluminum                     |
| 5   | Spring                            | 6   | Chrome Silicon Steel         |
| 6   | Anti-spin rod                     | 2   | Plated Steel                 |
| 7   | Adjuster retaining ring           | 1   |                              |
| 8   | M20 x 1.5 flat hex jam nut        | 1   | Plated Steel                 |
| 9   | 1/4-20 external tooth lock washer | 2   | Plated Steel                 |
| 10  | 1/4-20 x 2-1/4 hex head cap screw | 2   | Plated Steel                 |
| 11  | Actuator shaft                    | 1   |                              |
|   | 3/4" (20 mm) stroke               |     | Yellow Chromate Plated Steel |
|   | 1-1/2" (40 mm) stroke             |     | Bright Chromate Plated Steel |
| 12  | Start point adjuster              | 1   | Brass                        |
| 13  | Spring plate                      | 1   | Aluminum                     |
| 14  | Lower housing                     | 1   | Aluminum                     |
| 15  | Stem retainer clip                | 1   | Stainless Steel              |
| 16  | Stem nut                          | 1   | Stainless Steel              |
| 17  | Actuator retainer                 | 1   | Aluminum                     |
| 18  | Washer                            | 6   | —                            |
| 19  | #8 Thread forming screw           | 6   | —                            |
| Retainer bracket kit — Items 9, 10 and 17       |                                   |     | 599-00436                    |
| Diaphragm replacement kit — Items 3, 18, and 19 |                                   |     | 599-01070                    |
| Stem retainer kit — Items 15 and 16             |                                   |     |                              |
| For 2-1/2 and 3 inch valves                     |                                   |     | 599-10048                    |
| For 4, 5, and 6-inch valves                     |                                   |     | 599-10049                    |

## Service

### Diaphragm Replacement

Complete instructions are included in the diaphragm replacement kit.



**WARNING:**

Relieve spring tension before removing the actuator upper housing.

## Parts of the Actuator

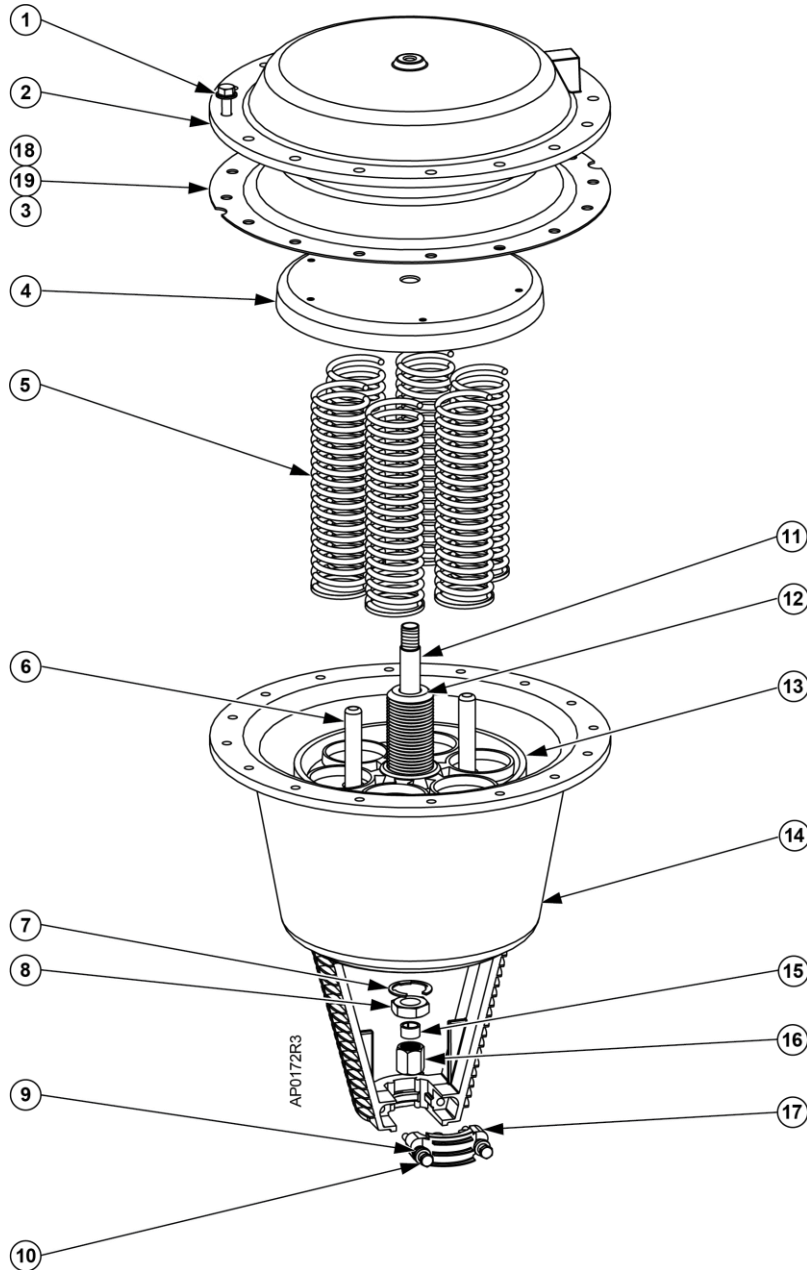


Figure 2. Flowrite AP 599 Series 12-inch Pneumatic Valve Actuator. See Table 2.

## Spring Adjustment

With the actuator in an upright position and the stem visible as shown in Figure 3, use a 1-1/16 inch open-end wrench to turn the adjustment screw.

- Normally Open Valves: To increase the start to close pressure, turn the adjustment screw from right to left. To decrease, turn the adjustment screw from left to right.
- Normally Closed Valves: To increase the start to open pressure, turn the adjustment screw from right to left. To decrease, turn the adjustment screw from left to right.

**NOTE:** As the line pressure differential across the valve increases, the spring span will increase.

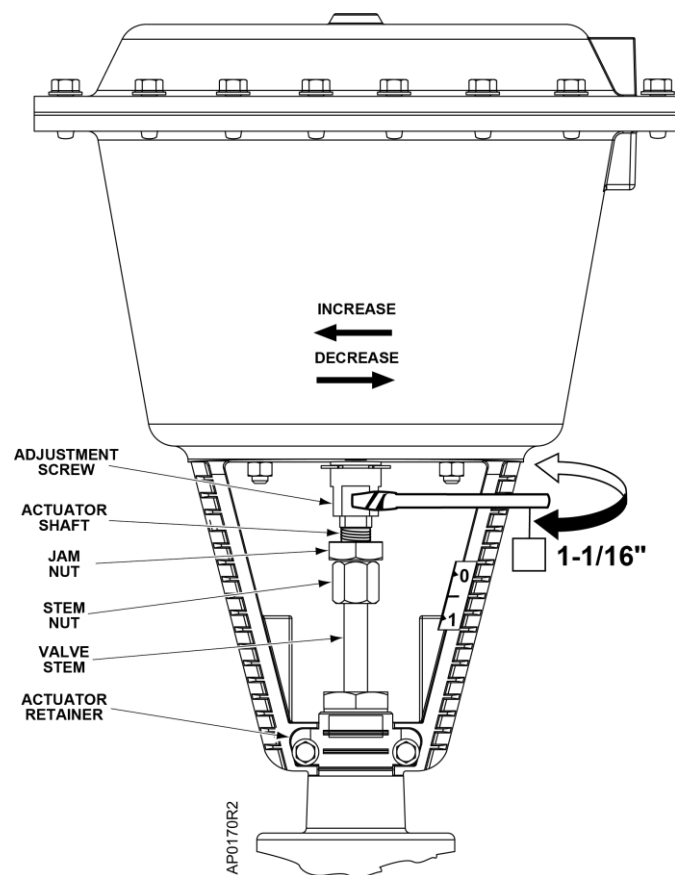


Figure 3. Spring Adjustment.

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