## Introduction

### Features & Benefits

- Single-axis, force-balance principle of operation, ensures accurate and stable positioning
- Feedback circuits direct the actuator's position, ensuring adherence to the control instrument signal
- Range spring capability accommodates a wide variety of valve strokes and instrument spans

### Description

The Series 73 Built-in Valve Positioners use the full force of their air supply to drive and maintain the piston or diaphragm in a pneumatic actuator to position a valve to what is required by a control instrument, regardless of the presence of forces that change valve position.

This line of compact instruments incorporates a single-axis, force-balance principle of operation to ensure accurate and stable control valve positioning. In all cases, including bottom-loading applications, a Model 73 Built-In Valve Positioner is mounted directly on the topwork of the valve, with no external levers or other exposed mechanisms.

Each positioner receives a signal from a control instrument, and using an air supply as high as 100 psig, the positioner strokes the valve actuator to the required position.

Like all valve positioners, the Model 73 Built-In Valve Positioners have feedback circuits designed to measure the position of the actuator's piston or diaphragm. The positioner then supplies or exhausts air to bring the actuator within the required range for its corresponding control instrument.

The position of the piston or diaphragm in the valve actuator is sensed by the amount of compressive force exerted by a range spring on the valve positioner's diaphragm assembly. By selecting the appropriate range spring from the wide selection available almost any combination of valve stroke (from 1/4" to 4") and instrument span (from 2 to 24 psi) can be obtained.

### Specifications

#### Functional Specifications

**Input Range**

3-15, 3-9, 9-15, 6-30, 3-27 psig

**Valve Travel**

Minimum: 1/4"
Maximum: 4"

**Supply Pressure**

Minimum: 3 psi above required actuator pressure
Maximum: 100 psig




**Air Consumption**

(In balance condition with 20 psig supply and 9 psig dead-ended output)
- 73N_F: 0.25 scfm
- 73N_B: 0.6 scfm

**Overrange Limit**

150 psig to any connection

Response Level

(output sensitivity to input pressure changes)
- 73N_F: 0.1% of input span
- 73N_B: 0.25% of input span

#### Functional Mechanical

**Materials of Construction**

Aluminum, brass, stainless steel, Neoprene®, and/or Buna-N

### Model Selection

| Model | Type of Application |
|---|---|
| 73N12F | Top-loading, direct-acting, input spans of 2 to 12 psi |
| 73N24F | Top-loading, direct-acting, input spans over 12 to 24 psi |
| 73N-FR | Top-loading, reverse-acting |
| 73N-B | Bottom-loading, direct-acting, with top air-cushion loading |
| 73N-B1 | Bottom-loading actuators w/actuator range spring |

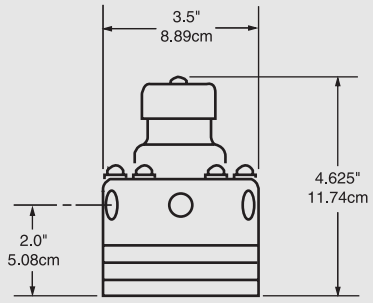
## Technical data

### Spring Table

| Instrument Input Pressure Span (PSI) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 | 24 |
| **Valve Stroke Inches** | **- Item No. of Range Spring Series 12395 Series ±5% Stroke Range Tolerance Example: 12395-1212** | | | | | | | | |
| 1/4 | 1212 | 1012 | 812 | 612 | 512 | 412 | 624 | 524 | 424 |
| 5/16 | 1612 | 1212 | 1012 | 712 | 612 | 512 | 824 | 624 | 524 |
| 3/8 | 1812 | 1412 | 1212 | 1012 | 712 | 612 | 1024 | 724 | 624 |
| 7/16 | 2012 | 1812 | 1412 | 1012 | 812 | 712 | 1024 | 824 | 724 |
| 1/2 | 2412 | 2012 | 1612 | 1212 | 1012 | 812 | 1224 | 1024 | 824 |
| 9/16 | 2812 | 2012 | 1812 | 1412 | 1012 | 1012 | 1424 | 1024 | |
| 5/8 | 3212 | 2412 | 2012 | 1612 | 1212 | 1012 | 1624 | 1224 | 1024 |
| 3/4 | 3612 | 2812 | 2412 | 1812 | 1412 | 1212 | | 1464 | 1224 |
| 7/8 | 4412 | 3612 | 2812 | 2012 | 1812 | 1412 | 2024 | 1624 | 1424 |
| 1 | 4812 | 4012 | 3212 | 2412 | 2012 | 1612 | 2424 | 2024 | 1624 |
| 1-1/8 | 5612 | 4412 | 3612 | 2812 | 2012 | 1812 | | 2024 | |
| 1-1/4 | 6412 | 4812 | 4012 | 3212 | 2412 | 2012 | 2824 | 2424 | 2024 |
| 1-1/2 | | 6412* | 4812 | 3612 | 2812 | 2412 | 4024 | 2824 | 2424 |
| 1-5/8 | | 6412* | 4812 | 4012 | 3212 | 2612 | 4024 | 3224 | |
| 1-3/4 | | 6412* | 5612 | 4412 | 3612 | 2812 | 4024 | 3224 | 2824 |
| 2 | | | 6412* | 4812 | 4012 | 3212 | 4824 | 4024 | 3224 |
| 2-1/4 | | | | 5612 | 4412 | 3612 | | 4024 | |
| 2-1/2 | | | | 6412* | 4812 | 4012 | | 4824 | 4024 |
| 2-3/4 | | | | 6412* | 4812 | 4412 | | 4824 | 4824 |
| 3 | | | | | 6412* | 4812 | | | 4824 |
| 3-1/2 | | | | | | 5612 | | | |
| 4 | | | | | | 6412* | | | |

1) The maximum zero pressure for Model 73N12F is 9 psig when the 12395 series range spring is used.
2) The maximum zero pressure for Model 73N24F is 15 psig for instrument pressure spans of 16 psi or greater, and 28 psig when used for spans of 12 psi or less.
3) The maximum instrument pressure for Model 73N-FR is 15 psig for instrument pressure spans of 12 psi or less, and 27 psi for spans of 16 psi or greater.

### Mounting Dimensions




The topworks of the valve must have six, 1/4-20 x 9/16 deep (min.) blind tapped, equally spaced holes for mounting positioner

### Spring Selection

1. Find the valve stroke nearest the desired valve stroke.
2. Find the instrument input pressure span nearest the desired instrument input pressure span.
3. Select the proper range spring at the intersection of the valve stroke and the instrument input pressure span columns.