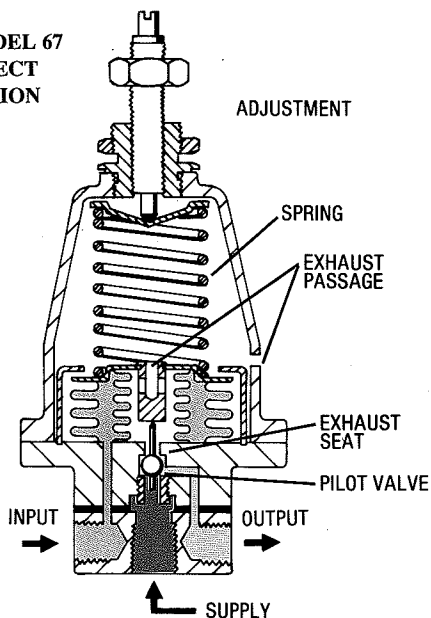




# Precision Relays

**MODEL 67  
DIRECT  
ACTION**



ALL CONNECTIONS ARE 1/4" NPT

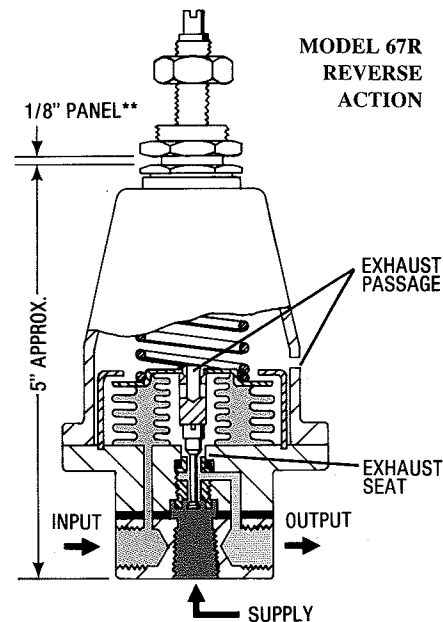
Model	Nominal Throttling Range*	Action
67-25	4%	Direct
67R25	4%	Reverse
67-100	1%	Direct
67R100	1%	Reverse

\* Based on 3-15 psig output change with 20 psig supply pressure

\*\* 25/32" dia. hole (+0 -1/64) for mounting

An optional mounting bracket, with two 9/32 dia. holes (spaced 2-3/8" apart on centerline to centerline) can be provided.

**MODEL 67R  
REVERSE  
ACTION**



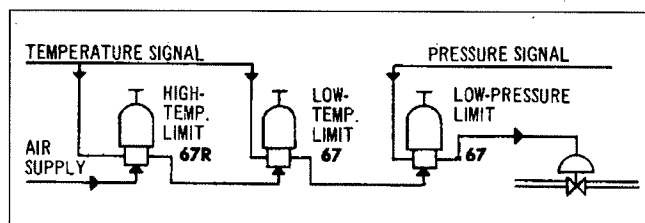
## DESCRIPTION

Series 67 precision relays are narrow-band pneumatic controllers; with each one having an adjustable setpoint. These relays provide a high gain, repeatable output in response to changes of the pneumatic input.

Series 67 relays are ideally suited for use as:

- Narrow-band proportional controllers, for direct process control
- Pneumatic safety and interlock switches
- Primary amplifiers, for precise operation of electrical pressure switches

A typical application of these high-gain relays is to activate a fail-safe valve when any of several process variables exceeds certain limits, potentially causing an unsafe condition. Model 67 relays are connected in series to monitor pneumatic signals, which are proportional to each process variable. Supply air to the normally closed (air-to-open) shutdown valve is connected through each of these relays. When all of the process variables are within operating limits, the supply air will pass through each relay - holding the valve open. When any variable exceeds its set limit, the supply air will be shut off, and the relay output will be vented to close the fail-safe valve.



### Operation: Direction Action

Pressure in the input bellows opposes the load on the adjusting spring. Whenever this input pressure exceeds the spring setting, the exhaust seat will be closed (as illustrated above) and the open supply seat will allow full supply pressure to pass directly to the output.

Conversely, whenever the input pressure is below the spring setting, the supply seat will be closed and the exhaust seat will be open. The output, in this case, will be zero.

In intermediate positions, the pilot valve throttles supply pressure to the output.

**Throttling Range:** The throttling range (expressed as a percentage of 3-15 psig) is the input change necessary to produce a 3-15 psig output change, with 20 psig supply pressure. For higher supply pressures, the output change will be increased proportionately.

The throttling range is determined by spring rate, pilot travel, and bellows area. The principal difference between relays with 4% throttling ranges and those with 1% throttling ranges is that the latter instruments have larger input bellows.

**Reverse-Action:** With reverse-acting relays, the output decreases as the input increases. This action is obtained by means of a reverse-acting pilot valve that closes the supply seat and opens the exhaust seat on increasing input pressure.

## OPERATING CHARACTERISTICS

Input setpoint range:

Models 67-25 and 67R25: 4" Hg vacuum to 35 psig (0.14-2.4 bar)

Models 67-100 and 67R100: 4" Hg vacuum to 16 psig (0.14-1.1 bar)

Output pressure range: 0 to supply pressure

Supply pressure:

Nominal: 18-20 psig (1.2-1.4 bar)

Maximum: 100 psig (6.9 bar)

Input maximum overload protection:

Models 67-25 and 67R25: 40 psig (2.8 bar)

Models 67-100 and 67R100: 25 psig (1.7 bar)

Throttling range, nominal:\*

Models 67-25 and 67R25: 0.63 psig (4.3 kPa)

Models 67-100 and 67R100: 0.22 psig (1.5 kPa)

Ambient temperature limits: -60° to +180°F (-51° to +82°C)

Flow capacity:\*\* 0.7 scfm (20 dm<sup>3</sup>)

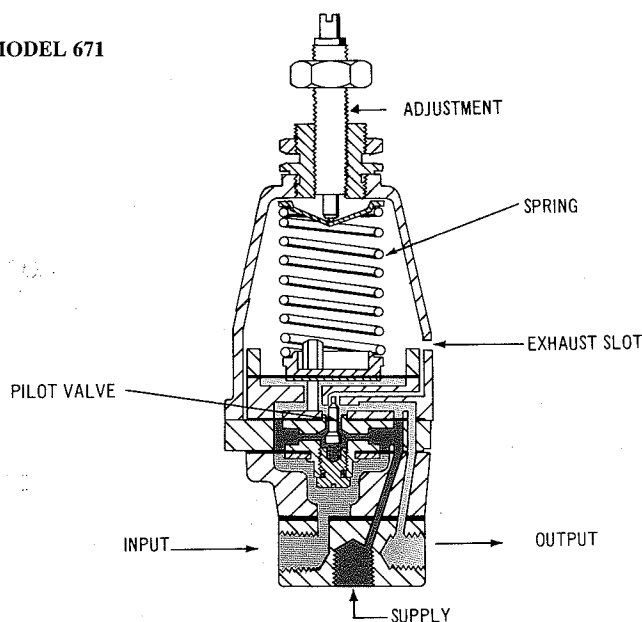
\* Input change required for full-scale change of output at the setpoint with 100 psig supply and a regulator setting of 20 psig

\*\* With 100 psig supply and a regulator setting of 20 psig

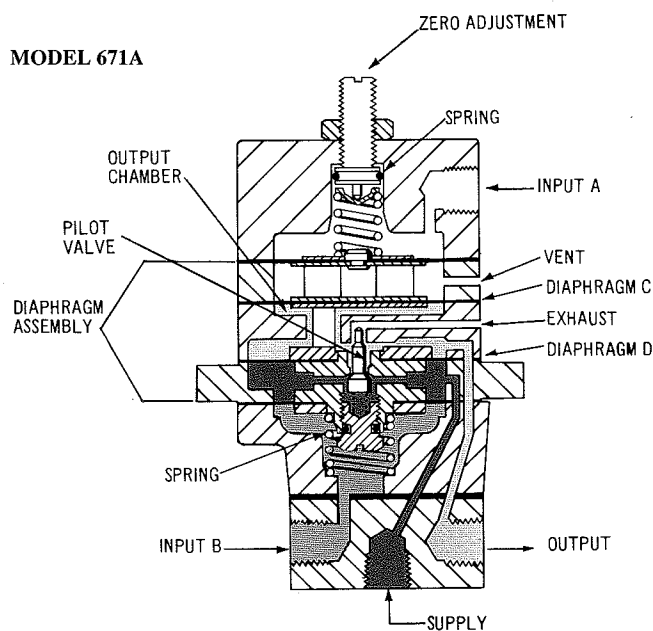
# SNAP-ACTION Precision Relays

# AIR-LOADED RELAYS Precision Relays

MODEL 671



MODEL 671A



## DESCRIPTION

The Model 671 Precision Relay is similar to Series 67 Relays, except that it provides snap-action switching.

The diaphragm pilot in the Model 671 relay has a positive feedback from the output. Therefore, as soon as the spring-loaded setpoint is reached, the output will go to full supply pressure - with no additional increase in input. In fact, after this relay has fired, the input pressure must fall below the setpoint in order to reduce the output to zero.

### Input Differential Gap

For an input pressure of 15 psi, the input differential gap - or "dent" - of this relay (defined as the difference between actuating points on increasing and decreasing inputs) is approximately 0.4 psi. Sometimes the input differential gap is designated as a negative throttling band; which, in this case, is approximately 3% of a full-scale 3-15 psig input.

The Model 671 Relay may be used in the same general types of applications as the Series 67 Relays - with one major exception. When a positive throttling of the input is not desirable, this snap-action relay should be substituted for either of the direct-action, Model 67 Relays listed on the opposite side of this page.

## OPERATING CHARACTERISTICS

Input setpoint range: 1-24 psig (0.07 - 1.7 bar)

Output pressure range: 0 to supply pressure minus 1 psig

Supply pressure:\* Nominal: 18-20 psig (1.2-1.4 bar)

Maximum: 100 psig (6.9 bar)

Overload protection: 100 psig (6.9 bar) to any connection

Input differential gap: 0.15 - 0.4 psig (1-2.8 kPa)

Ambient temperature limits: -25° to +180°F (-32° to +82°C)

Flow capacity:\*\* 2.7 scfm (76 dm<sup>3</sup>)

\* The supply pressure must exceed the loading pressure.

\*\* With 20 psig supply pressure

## DESCRIPTION

The Model 671A Precision Relay is similar to Series 67 Relays, except that its setpoint is determined by a pneumatic signal instead of a loading spring. This air-loaded relay is therefore a narrow-band pneumatic controller which compares two pneumatic input signals. The high-gain output is typically used to provide a deviation-alarm, or a switching action.

Since the pressures applied to inputs A and B can be interchanged, the Model 671A may be connected for either increasing or decreasing output - with reference to a given input.

When input A exceeds input B, the diaphragm assembly is forced downward closing the supply seat and opening the exhaust seat. In this case, the output will be zero.

### Throttling Action

As input B increases to match input A, the diaphragm assembly will begin to rise opening the supply seat and closing the exhaust seat. Since diaphragm D is larger than diaphragm C, the output pressure will act to oppose input B. Thus, input B must increase some amount to offset this "negative feedback" before the output reaches full supply.

## OPERATING CHARACTERISTICS

Input setpoint range: Nominal: 3-15 psig (0.2-1 bar)

Maximum: 100 psig (6.9 bar)

Output pressure range: 0 to supply pressure minus 3 psig

Supply pressure:\* Nominal: 18-20 psig (1.2-1.4 bar)

Maximum: 100 psig (6.9 bar)

Overload protection: 100 psig (6.9 bar) to any connection

Throttling range:\*\* 0.06-0.6 psig (0.41-4.1 kPa)

Ambient temperature limits: -25° to +180°F (-32° to +82°C)

Flow capacity - supply and exhaust:\*\* 2.7 scfm (76 dm<sup>3</sup>)

\* The supply pressure must exceed the loading pressure.

\*\* With 20 psig supply pressure

The information in this document is subject to change without notice. Customers are urged to consult with a Moore Products Co. sales representative to confirm availability and specifications.

**MOORE PRODUCTS CO., Spring House, PA 19477**

An ISO registered company

Subsidiaries: Australia, Canada, France, India, Italy, Japan, Mexico, Netherlands, Singapore & United Kingdom

TEL: (215) 646-7400 FAX: (215) 283-6358

