

MB MARSH *BELLOFRAM*[®]

Type 20
Type 72
Type 75
Type 79

Volume Boosters

MB Volume Boosters



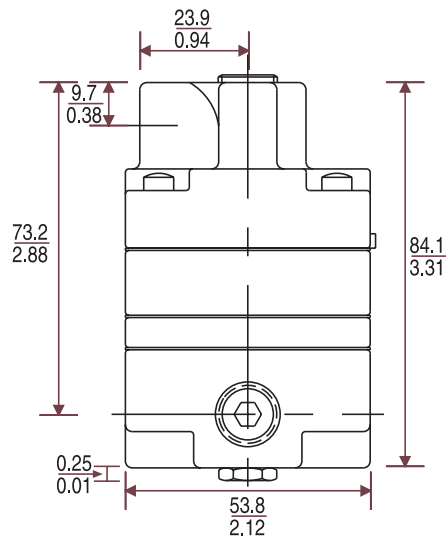
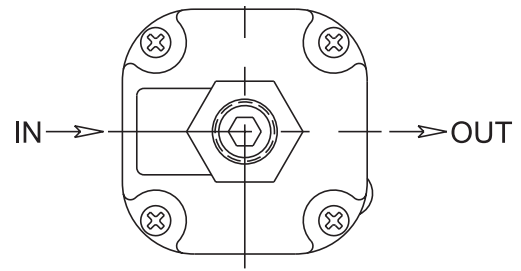
Precision
Control
Devices

ISO 9002
certified

IN

OUT

TYPE 20



TYPE 20 PRECISION AIR RELAY

FEATURES

- Extreme accuracy
- Positive and negative bias capability
- Small size
- Rugged and stable

DESCRIPTION

The Type 20 Air Relay is a compact, two-stage, pilot operated 1:1 relay with positive and negative bias adjustment capability. It accepts a signal pressure and combined with the bias adjustment, maintains a resulting output pressure with an accuracy and reliability unmatched by any other pressure relay in its price range.

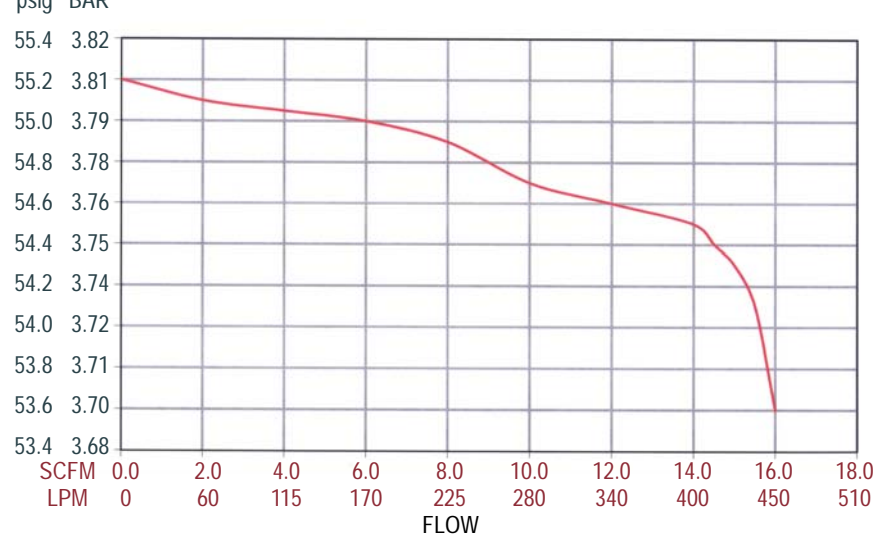
MODELS

TYPE 20 - The basic relay is offered with a choice of three port sizes.

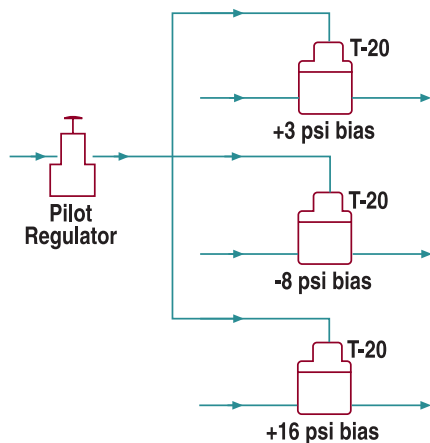
TYPE 20HR & TYPE 20EXHR - High Relief Relays - These relays provide extra fast "blowdown" for very rapid release of output pressure. The extra relief feature makes this relay suitable for cylinder return stroke actuation, air hoists, and similar applications requiring fast exhaust.

TYPE 20HF - This relay is ideal for applications where the supply pressure is relatively low and a high flow rate is desired.

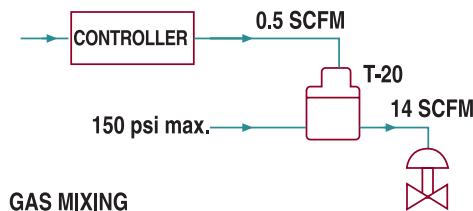
TYPE 20, 20HR & 20EXHR FLOW CURVE
@ 100 psig (6.9 BAR) Supply Pressure



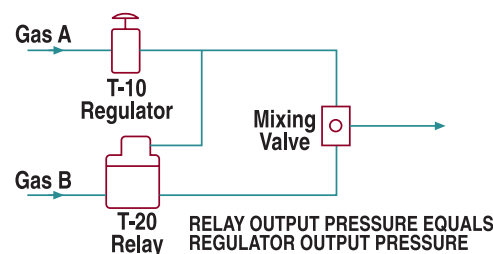
MULTIPLE OUTPUTS



VOLUME BOOSTING AND REMOTE LOADING



GAS MIXING



APPLICATIONS

- Gate Actuators
- Air Hoists
- Disc & Shoe Brakes
- Remote Positioning Devices
- Valve Rotors
- Control Valves
- Tensioning Systems
- Web Tracking Systems

FEATURES

- Four adjustable bias ranges, from 0-10 psi (0-0.7 BAR) to 2-150 psi (0.1-10.3 BAR)
- Flow capacity up to 50 SCFM
- Quick response to minute changes in downstream pressure
- Dampening action of aspirator tube maintains stable output pressure
- Output virtually unaffected by changes in supply pressure
- Internal rolling diaphragm designed for millions of cycles
- Honking and buzzing eliminated by action of integral baffle and aspirator tube
- Can be disassembled and serviced without removing from line.

DESCRIPTION

The Type 72 Relay features an adjustable bias pressure which enables users to obtain an output pressure which is the sum of a controlled input signal pressure plus the bias. The relay offers an exceptionally high flow capacity (up to 50 SCFM/1400 LPM) with minimal pressure droop.

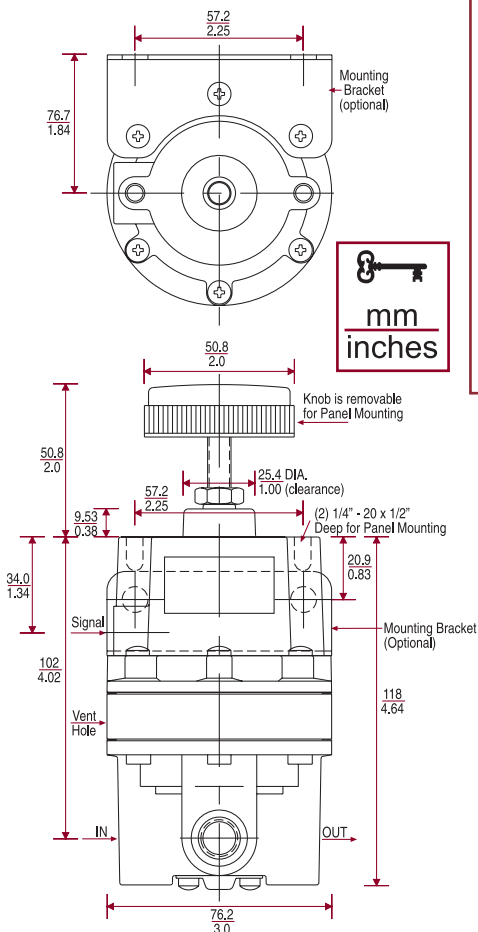
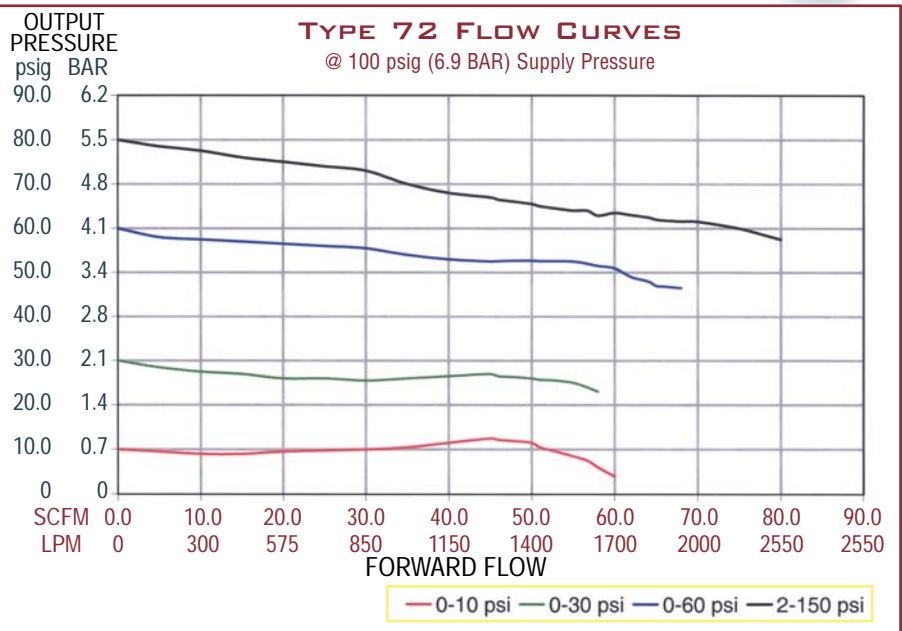
Output pressure is accurately maintained under varying flow conditions by means of an aspirator tube, which adjusts the air supply valve opening in proportion to flow velocity. A balanced supply valve utilizing a rolling diaphragm makes the relay virtually immune to changes in supply pressure. Simple design makes maintenance easy, and the relay can be serviced without removing it from the line. The standard signal-to-output ratio is 1:1, but 1:2, 1:4 and 1:6 ratios are available on special request.



TYPE 72



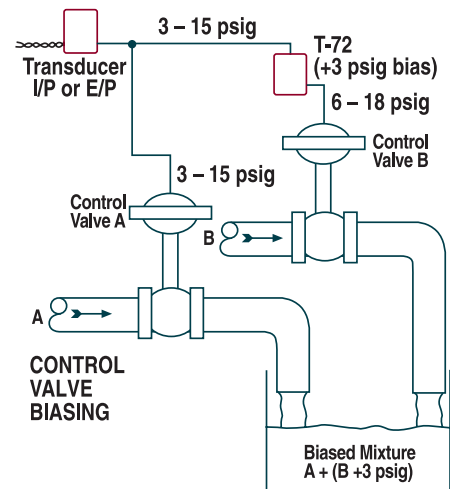
TYPE 72 POSITIVE BIAS BOOSTER RELAY



APPLICATIONS

The Type 72 Relay is used when high flow capacity is required in conjunction with a positive output pressure bias. Typical applications include:

- Gas Flow Control
- Tensioning Control
- Clutch & Brake Controls
- Volume Boosting
- Dancer Roll Loading
- Calendar Roll Loading
- Cylinder Bucking Control
- Valve Motor Loading



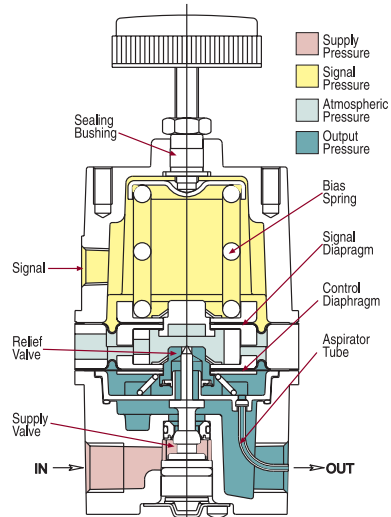
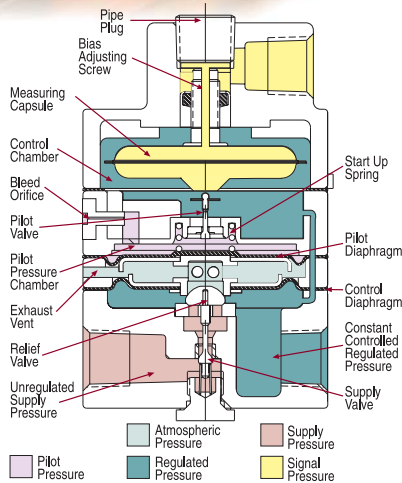
	TYPE 20	TYPE 20 HR	TYPE 20 EXHR	TYPE 20 HF
Maximum Supply Pressure	150 psig (10.3 BAR)	150 psig (10.3 BAR)	150 psig (10.3 BAR)	50 psig (3.4 BAR)
Sensitivity	1/8" H ₂ O (3.2mm)	1/8" H ₂ O (3.2mm)	1/8" H ₂ O (3.2mm)	1/8" H ₂ O (3.2mm)
Supply Pressure Sensitivity	0.005 psig (0.35 mBAR) per 25 psig (1.7 BAR) change in supply pressure	0.005 psig (0.35 mBAR) per 25 psig (1.7 BAR) change in supply pressure	0.005 psig (0.35 mBAR) per 25 psig (1.7 BAR) change in supply pressure	0.005 psig (0.35 mBAR) per 25 psig (1.7 BAR) change in supply pressure
Flow Capacity	14 SCFM (400 LPM) @ 20 psig (1.4 BAR) signal and 100 psig (6.9 BAR) supply	14 SCFM (400 LPM) @ 20 psig (1.4 BAR) signal and 100 psig (6.9 BAR) supply	14 SCFM (400 LPM) @ 20 psig (1.4 BAR) signal and 100 psig (6.9 BAR) supply	40 SCFM (1130 LPM) @ 20 psig (1.4 BAR) signal and 50 psig (3.5 BAR) supply
Exhaust Capacity	2 SCFM (55 LPM) @ 5 psig (0.35 BAR) above a 20 psig (1.4 BAR) setpoint	10 SCFM (285 LPM) @ 5 psig (0.35 BAR) above a 20 psig (1.4 BAR) setpoint	15 SCFM (425 LPM) @ 5 psig (0.35 BAR) above a 20 psig (1.4 BAR) setpoint	2 SCFM (55 LPM) @ 5 psig (0.35 BAR) above a 20 psig (1.4 BAR) setpoint
Temperature Limits	-20 to 160°F (-29 to 71°C)	-20 to 160°F (-29 to 71°C)	-20 to 160°F (-29 to 71°C)	-20 to 160°F (-29 to 71°C)
Air Consumption	8 SCFH (4 LPM)	8 SCFH (4 LPM)	8 SCFH (4 LPM)	8 SCFH (4 LPM)
Port Size	1/8", 1/4", 3/8" NPT, BSPP, BSPT	1/8", 1/4", 3/8" NPT, BSPP, BSPT	1/8", 1/4", 3/8" NPT, BSPP, BSPT	3/8" NPT, BSPP, BSPT
Output Pressure Range	2-120 psig (0.1 - 8.3 BAR)	2-120 psig (0.1 - 8.3 BAR)	2-120 psig (0.1 - 8.3 BAR)	2-50 psig (0.1 - 3.5 BAR)
Maximum Signal	120 psig (8.3 BAR)	120 psig (8.3 BAR)	120 psig (8.3 BAR)	50 psig (3.5 BAR)
Weight	1.4 lb. (0.6 kg.)	1.4 lb. (0.6 kg.)	1.4 lb. (0.6 kg.)	1.4 lb. (0.6 kg.)
Ratio of Accuracy for a 12 psig span	<0.5%	<0.5%	<0.5%	<0.5%




TYPE 20



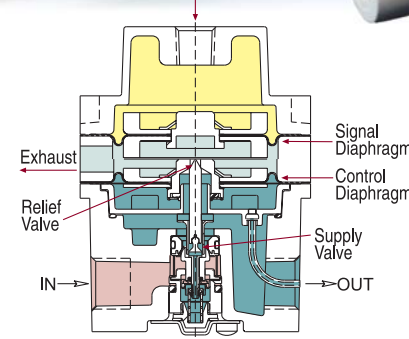
TYPE 72



TYPE 72	TYPE 75	TYPE 75 HR	TYPE 79
250 psig (17.2 BAR)	250 psig (17.2 BAR)	250 psig (17.2 BAR)	400 psig (27.6 BAR)
¼" H ₂ O (6.4mm)	¼" H ₂ O (6.4mm)	¼" H ₂ O (6.4mm)	1" H ₂ O (25mm)
< 0.1 psig (0.01 BAR) per 50 psig (1.4 BAR) change in supply pressure	< 0.6 psig (0.04 BAR) per 50 psig (3.5 BAR) change in supply pressure	< 0.6 psig (0.04 BAR) per 50 psig (3.5 BAR) change in supply pressure	< 0.35 psig (0.02 BAR) per 100 psig (6.9 BAR) change in supply pressure
40 SCFM (1150 LPM) @ 20 psig (1.4 BAR) signal and 100 psig (6.9 BAR) supply	40 SCFM (1150 LPM) @ 20 psig (1.4 BAR) signal and 100 psig (6.9 BAR) supply	40 SCFM (1150 LPM) @ 20 psig (1.4 BAR) signal and 100 psig (6.9 BAR) supply	>125 SCFM (3500 LPM) @ 20 psig (1.4 BAR) signal and 100 psig (6.9 BAR) supply
6 SCFM (170 LPM) @ 10 psig (0.69 BAR) above a 20 psig (1.4 BAR) setpoint	6 SCFM (170 LPM) @ 10 psig (0.69 BAR) above a 20 psig (1.4 BAR) setpoint	15 SCFM (425 LPM) @ 10 psig (0.69 BAR) above a 20 psig (1.4 BAR) setpoint	31 SCFM (875 LPM) @ 5 psig (0.35 BAR) above a 20 psig (1.4 BAR) setpoint
-40 to 200°F (-40 to 93°C)	-40 to 200°F (-40 to 93°C)	-40 to 200°F (-40 to 93°C)	-40 to 200°F (-40 to 93°C)
<12 SCFH (5.7 LPM)	<12 SCFH (5.7 LPM)	<12 SCFH (5.7 LPM)	<12 SCFH (5.7 LPM)
¼", ⅜", ½" NPT, BSPP, BSPT	¼", ⅜" NPT, BSPP, BSPT	¼", ⅜", ½" NPT, BSPP, BSPT	⅜", ½", ¾", 1" NPT, BSPP, BSPT
0-150 psig (0-10.3 BAR)	0-150 psig (0-10.3 BAR)	0-150 psig (0-10.3 BAR)	0-200 psig (0-13.8 BAR)
150 psig (10.3 BAR)	150 psig (10.3 BAR) for 1:1 ratio	150 psig (10.3 BAR) for 1:1 ratio	200 psig (13.8 BAR)
1.75 lb. (0.8 kg.)	1.3 lb. (0.6 kg.)	1.3 lb. (0.6 kg.)	4.5 lb. (2.0 kg.)
< 2%	< 2% (1:1)	< 2% (1:1)	<1.5%




TYPE 75

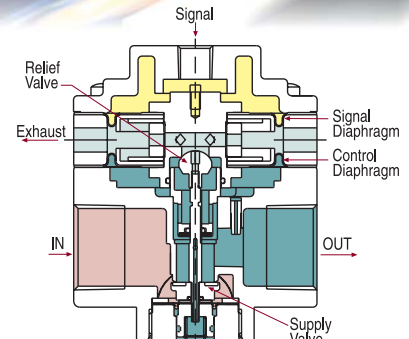


Atmosphere
 Regulated Pressure

Supply Pressure
 Signal Pressure



TYPE 79



Atmosphere
 Regulated Pressure

Supply Pressure
 Signal Pressure

IMPORTANT NOTICE: Our recommendations, if any, for the use of this product are based on tests believed to be reliable. The greatest care is exercised in the selection of our raw materials and in our manufacturing, no guarantee or warranty, express or implied is made as to such use or effects incidental to such use, handling or possession or the results to be obtained, whether in accordance with the directions or claimed so to be. The manufacturer expressly disclaims responsibility therefor. Furthermore, nothing contained herein shall be construed as a recommendation to use any product in conflict with existing laws and/or patents covering any material use.

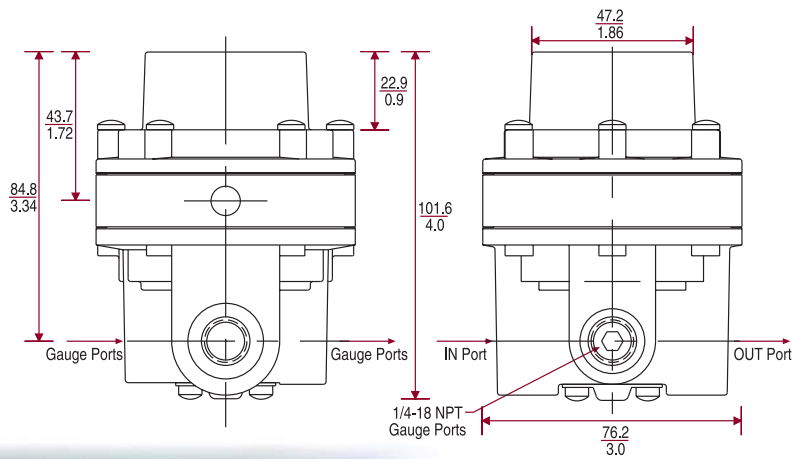
FEATURES

- Balanced valve design
- High flow capacity
- Field serviceable
- Multiple output ratios
- Negative biasing option

DESCRIPTION

The Type 75 relay uses signal pressure to accurately control output pressure over a wide range of flow and supply pressure variation.

Under varying flow conditions output pressure is maintained by use of an aspirator tube, which adjusts the air supply valve opening in accordance with the flow velocity. A balanced supply valve, utilizing a rolling diaphragm, makes the relay virtually immune to changes in supply pressure. Maintenance is simple due to the unit construction, and the relay can be serviced without removing it from the line. Signal to output pressure ratios of 1:1, 1:2, 1:4 and 1:6 are available. Maximum output is 150 psig (10.3 BAR).



TYPE 75



APPLICATIONS

- Volume Boosting
- Dancer Roll Loading
- Calendar Roll Loading
- Cylinder Bucking Control
- Clutch and Brake Controls
- Gas Flow Control
- Tensioning Control
- Valve Motor Loading

MODELS

TYPE 75 - The basic relay offers excellent precision along with high forward flow rates.

TYPE 75 HIGH RELIEF RELAYS - These relays provide extra fast "blowdown" for very rapid release of output pressure. The extra relief feature makes this relay suitable for cylinder return stroke actuation, air hoists, and similar applications requiring fast exhaust.

TYPE 75 NEGATIVE BIAS - The Type 75 Relay is also available with a 4 ± 1 psig (0.3 ± 0.07 BAR) negative bias spring mounted internally. (See cross-sectional drawing on previous page.) This bias spring automatically subtracts 4 ± 1 psig (0.3 ± 0.07 BAR) from any signal pressure introduced. The relay then multiplies the net signal pressure by its ratio value to obtain final output pressure.

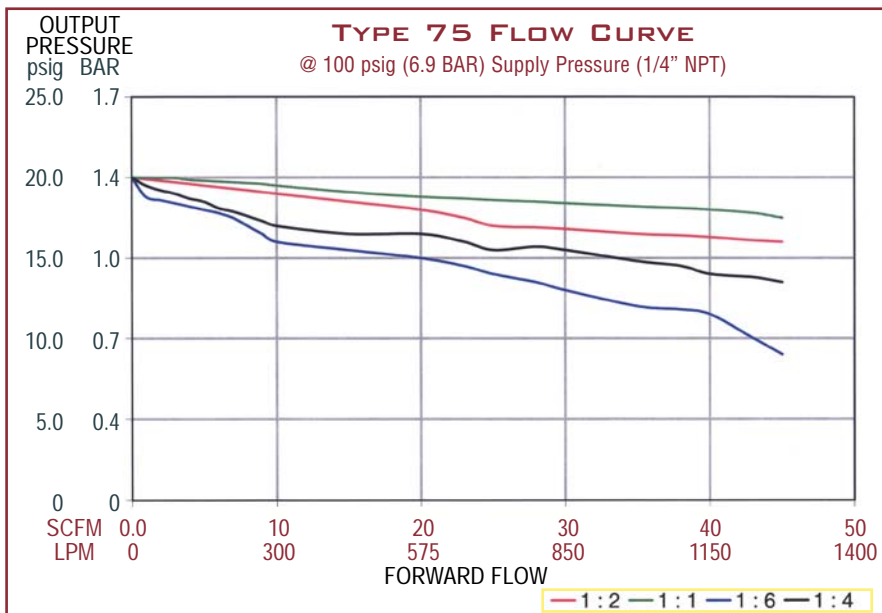
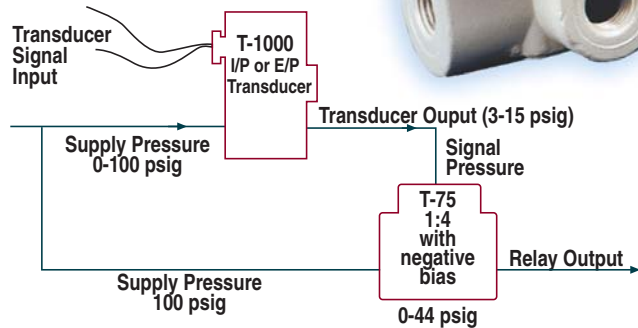
This option is particularly useful in obtaining zero pressure from pneumatic devices such as I/P transducers that normally cannot be adjusted this low, as well as obtaining higher outputs from such devices.

Typical applications of the Type 75 Relay with fixed negative bias include the electronic control of the applications listed for the standard Type 75 Relay.

To calculate relay output:

Relay output = (signal pressure) - 4 psi bias x (relay ratio factor) where the relay ratio factor is defined as follows:

Relay Ratio	Factor
1:1	1
1:2	2
1:4	4
1:6	6



FEATURES

- Balanced pintle
- High flow capacity
- Field serviceable
- Large port sizes available
- Air piloted or dome loaded
- 200 psig output

DESCRIPTION

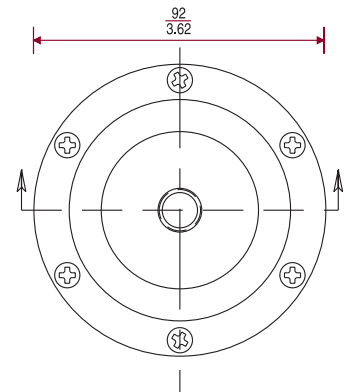
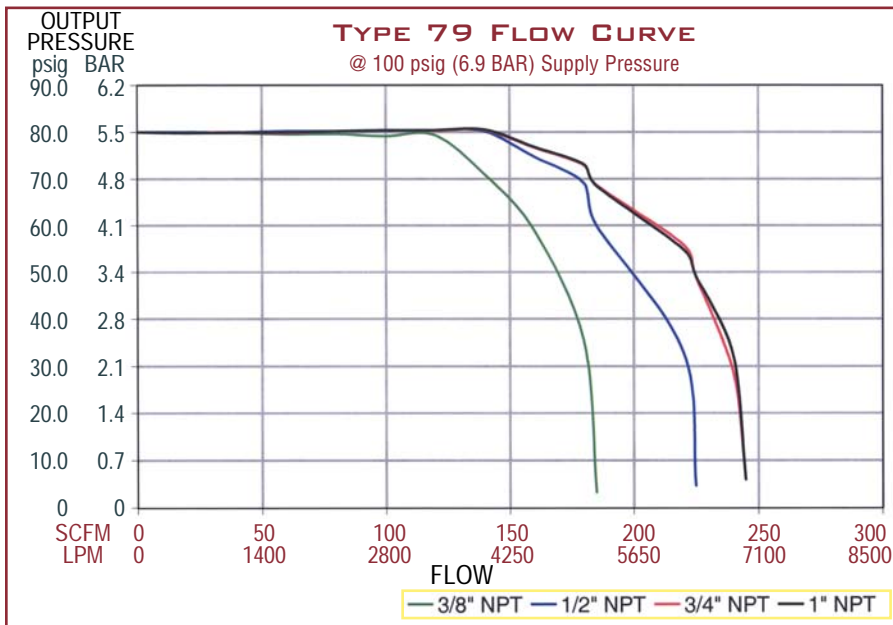
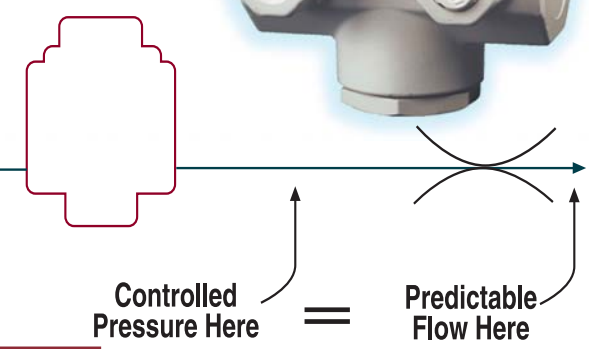
The Type 79 1:1 Ratio High Flow Precision Air Relay brings additional precision and control to the Bellofram line of precision control products.

The Type 79 relay is designed for applications where a precise control of flow is needed. This regulator offers low droop, high accuracy and fine adjustment sensitivity. The use of a Bellofram rolling diaphragm provides greater sensitivity and improved accuracy. The balanced pintle minimizes output pressure changes caused by fluctuations in supply pressure.

Careful design and quality materials throughout assure long, trouble-free operation. The rugged die-cast zinc and aluminum housings are pressure tested to assure safe operation. The Type 79 is designed to withstand harsh and abusive environments. This is attributed to a chemical conversion coating of all cast components, and a vinyl paint finish.

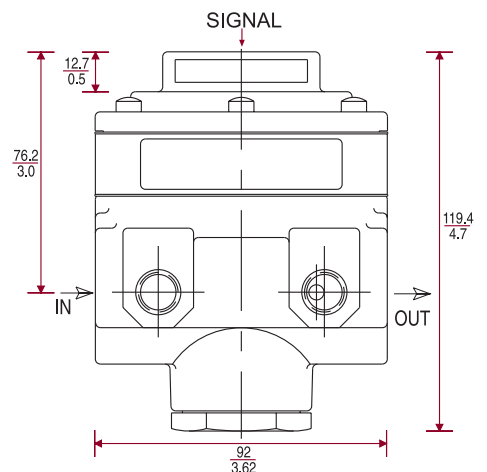
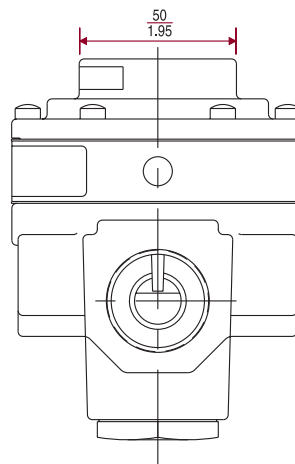
The Type 79 can achieve flow rates of well over 100 SCFM (2850 LPM). This relay can be pipe or bracket mounted.

TYPE 79



APPLICATIONS

- Clutch & Brake Controls
- Cylinder Bucking Control
- Dancer (calendar) Roll Loading
- Gas Flow Control
- Tension Control
- Valve Motor Loading
- Volume Boosting



TYPE 79 HIGH FLOW PRECISION AIR RELAY

Type	Port Size (NPT)	Range psig	Range BAR	Part Number
Type 20	1/8"	2-120	0.1-8.3	961-004-000
Precision Relay	1/4"	2-120	0.1-8.3	961-005-000
1:1 Ratio	3/8"	2-120	0.1-8.3	961-006-000
Type 20HR Precision Relay	1/8"	2-120	0.1-8.3	961-001-000
High Relief Capacity	1/4"	2-120	0.1-8.3	961-002-000
1:1 Ratio	3/8"	2-120	0.1-8.3	961-003-000
Type 20 HF Precision Relay	3/8"	2-50	0.1-3.5	961-071-000
High Flow Capacity 1:1 Ratio				
Type 20 EXHR	1/8"	2-120	0.1-8.3	961-009-000
1:1 Ratio	1/4"	2-120	0.1-8.3	961-010-000
	3/8"	2-120	0.1-8.3	961-011-000
Type 72	3/8"	0-10	0-0.7	961-062-000
Positive Bias Booster Relay	3/8"	0-30	0-2.1	961-063-000
1:1 Ratio	3/8"	1-60	0.07-4.1	961-064-000
	3/8"	2-150	0.1-10.3	961-065-000
	1/4"	0-10	0-0.7	961-052-000
	1/4"	0-30	0-2.1	961-053-000
	1/4"	1-60	0.07-4.1	961-054-000
	1/4"	2-150	0.1-10.3	961-055-000
Type 75 Precision Relay				
1:1 Ratio	1/4"	0-150	0-10.3	961-058-000
1:1 Ratio	3/8"	0-150	0-10.3	961-066-000
1:2 Ratio	1/4"	0-150	0-10.3	961-059-000
1:2 Ratio	3/8"	0-150	0-10.3	961-067-000
1:4 Ratio	1/4"	0-150	0-10.3	961-060-000
1:4 Ratio	3/8"	0-150	0-10.3	961-068-000
1:6 Ratio	1/4"	0-150	0-10.3	961-045-000
1:6 Ratio	3/8"	0-150	0-10.3	961-069-000
Type 75 Precision Relay - Fixed Negative Bias (4psi)				
1:1 Ratio	1/4"	0-150	0-10.3	961-090-000
1:1 Ratio	3/8"	0-150	0-10.3	961-091-000
1:2 Ratio	1/4"	0-150	0-10.3	961-092-000
1:2 Ratio	3/8"	0-150	0-10.3	961-093-000
1:4 Ratio	1/4"	0-150	0-10.3	961-094-000
1:4 Ratio	3/8"	0-150	0-10.3	961-095-000
1:6 Ratio	1/4"	0-150	0-10.3	961-096-000
1:6 Ratio	3/8"	0-150	0-10.3	961-097-000
Type 75HR Precision Relay				
1:1 Ratio	1/4"	0-150	0-10.3	961-144-000
1:1 Ratio	3/8"	0-150	0-10.3	961-145-000
1:1 Ratio	1/2"	0-150	0-10.3	961-146-000
1:2 Ratio	1/4"	0-150	0-10.3	961-147-000
1:2 Ratio	3/8"	0-150	0-10.3	961-148-000
1:2 Ratio	1/2"	0-150	0-10.3	961-149-000
Type 75HR Precision Relay - Fixed Negative Bias (4psi)				
1:1 Ratio	1/4"	0-150	0-10.3	961-150-000
1:1 Ratio	3/8"	0-150	0-10.3	961-151-000
1:1 Ratio	1/2"	0-150	0-10.3	961-152-000
1:2 Ratio	1/4"	0-150	0-10.3	961-153-000
1:2 Ratio	3/8"	0-150	0-10.3	961-154-000
1:2 Ratio	1/2"	0-150	0-10.3	961-155-000
Type 79	3/8"	0-200	0-13.8	961-156-000
High Flow Capacity	1/2"	0-200	0-13.8	961-157-000
1:1 Ratio	3/4"	0-200	0-13.8	961-158-000
	1"	0-200	0-13.8	961-159-000

For options and accessories, replace the last three zeros in the relay part number with three digits from the following tables:

Type 20

Option	8
8. Pressure Gauge	008

Type 72

Option	3	5	7	8	9
3. Knob (standard)					
Square Head	003	053	073	083	
5. Epoxy Finish		005	075	085	095
7. Mounting Bracket			007	087	097
8. Pressure Gauge				008	098
9. Tamper Resistant Cover					009

Type 75

Option	5	7	8
5. Epoxy Finish	005	075	085
7. Mounting Bracket		007	087
8. Pressure Gauge			008

Type 79

Option	1	2	5	6	7
1. Low Bleed	001		051	061	071
2. Non-Relieving		002	052	062	072
5. Epoxy Finish			005	065	075
6. Tapped Vent				006	076
7. Tapped Supply Port					007

Pressure Gauge: Dual scale (English & Metric) 2-inch (50.8 mm) gauges are available

Epoxy finish: Gray epoxy coating for greater corrosion resistance.

Mounting Bracket: Zinc-plated steel bracket for side mounting. (For T-79 order p/n 607-293-000)

Tamper Proof Cover: A cover placed over the adjusting screw to prevent ordinary hand adjustments.

Low Bleed: Reduces steady-state air consumption by approximately 50%.

Non-Relieving: Used in applications where it is desirable to relieve pressure downstream of the relay. Non-relieving relays should not be used for low or no flow applications.

Tapped Vent (Exhaust): 1/4" NPT tapped port to allow for installation of plumbing to capture exhaust air.

Tapped Supply Gauge Port: 1/4" NPT tapped port is offered as a pressure tap for monitoring the inlet or upstream pressure supplied to the regulator. (T-79 only)

BSPP or BSPT: British Standard Pipe Threads can be ordered by adding 'BSPP' or 'BSPT' to the end of the part number.



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