Models 40, 41, and 42 Precision Pressure Regulators

Introduction

Features & Benefits

- Multi-stage, low-droop precision regulators maintain constant output over wide changes in flow and supply pressure
- Epoxy powder coat paint delivers improved corrosion resistance
- Wide selection of regulated pressures [1" to 450 psi] affords application versatility
- Patented Nullmatic pressure regulation system provides reliable maintenance-free operation

Description

The Models 40, 41, and 42 Precision Pressure Regulators control air pressures in applications where precise and dependable regulation is required, such as pneumatic instrument circuits, test stands, production checking fixtures, and industrial air gages. As such, they are suitable for dead-end service, and flows up to a maximum of 110 scfm.

A unique, two-stage piloted design provides outstanding accuracy. Rugged construction—with no links, levers, pivots, or other friction-producing members—ensures reliable, maintenance-free operation. These features allow a regulator to maintain constant output pressure, regardless of even the widest changes in flow or supply pressures. In fact, a regulator using a Model 40, 41, or 42 is practically a self-contained pressure controller operating its supply-plunger valve via a built-in, high-gain pneumatic amplifier.

A fine-turn, precision screw is used to manually load the range spring, which sets the regulated pressure. When the adjusting knob is turned clockwise, the increased spring force is exerted on the top diaphragm assembly, decreasing the nozzle clearance and increasing the pilot pressure. Because the source for pilot pressure is supply air flowing to the pilot pressure chamber through the restriction screw, the increased pilot pressure forces the exhaust diaphragm assembly downward. This action closes the exhaust port, and contacts and moves the valve plunger, which opens the supply port. This increases the regulated output, which also feeds back to the top diaphragm assembly. The regulator locks-up or throttles at the new output value when the feedback force of the top diaphragm assembly equals the range spring force.

A safety release valve is incorporated in the top diaphragm assembly of several models. It operates if the regulated pressure increases 3 tnÚ psig more than the set pressure and exhausts air through the atmospheric vent in the top housing. Overpressure causes the diaphragm to move upward, which opens the safety release valve.



Specifications

Resolution Adjustment

Better than 0.03% of regulated output

Supply Pressure

Maximum & recommended pressures are listed on page 220
Minimum: 5 psig above regulated output

Supply Pressure Effect

Nominal ratio of change in regulated pressure for a change in supply
1:150 for Model 40 and 42
1:100 for Model 41

Ambient Temperature Limits

-40 to 180°F (-40 to 80°C)

Ambient Temperature Effect

Approximately 1% of set pressure with standard range spring; and approximately 0.1% with Isothermal spring for 50°F (27°C) temperature change

Knob Adjustment

Model 40 & 42: Nominal 10% of full range for one complete turn
Model 41: Nominal 15% of full range for one complete turn

Droop Effect

See Graph 1

Maximum Air Flow

See Graph 2

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Technical data

Air Consumption

See Graph 3

Drift Effect

See Graph 4

Exhaust-Flow Rate (at 25-psig setting)

Pressure rise of 0.25 psig will result from flow of:
Model 40: 1.5 scfm
Model 41: 2.4 scfm
Model 42: 1.7 scfm

Maximum Flow Capacity

See Graph on page 219

Standard Mounting

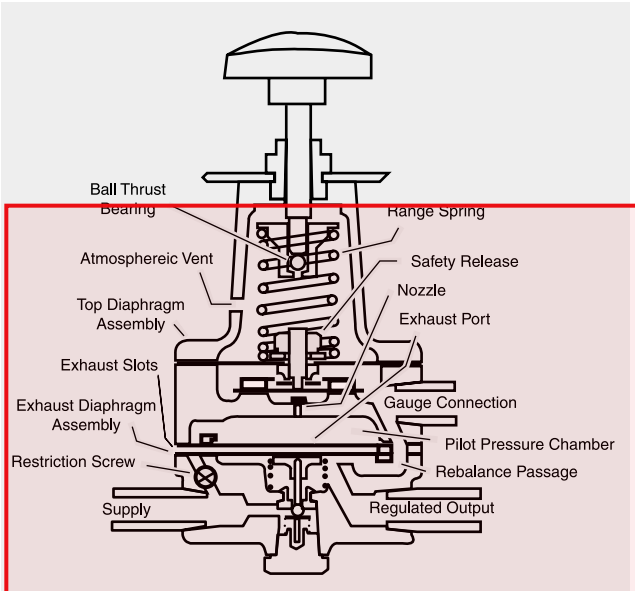
In-line pipe or flush panel up to 1/4" thick (bushing for 3/4" thick panel is optional)
Connections: (supply and outlet)
Model 40: 1/4" NPT
Model 41: 1/8" NPT
Model 42: 1/2" NPT

Materials of Construction (and materials in contact with regulated media)

Brass, stainless steel, Neoprene, aluminum, and zinc

Accessories

- P/N 2932-19 - Mounting Bracket for surface mounting (Model 40 and Model 42)
- P/N 10963-73 - Mounting Bracket for surface mounting (Model 41)
- P/N 3603-22 - Locknut



Options

Air Loading
Provision for supplementary air loading (100 psig max) in addition to spring loading
Model 40, 42: 1/4" NPT
Model 41: 1/8" NPT
Model 40-2: Not available
Add [A] into the model number.
Example: 40A15

Tapped Exhaust
Provision for piping exhaust flow away from the regulator
Model 40, 42: 1/8" NPT
Model 41: Not available
Add [E] into the model number.
Example: 40E15

Isothermal Range Spring
Reduces ambient temperature effect from approximately 1% of set pressure to approximately 0.1% for a 50°F [27°C] temperature range
Model 40: 15, 30, 50, & 100 psig ranges
Model 41: Not available
Model 42: 30, 50, & 100 psig ranges
Add (M9) to the Moore 40 number.
Add (M26) to the Moore 42 model number.
Example: 40-15M9, 42-30M26

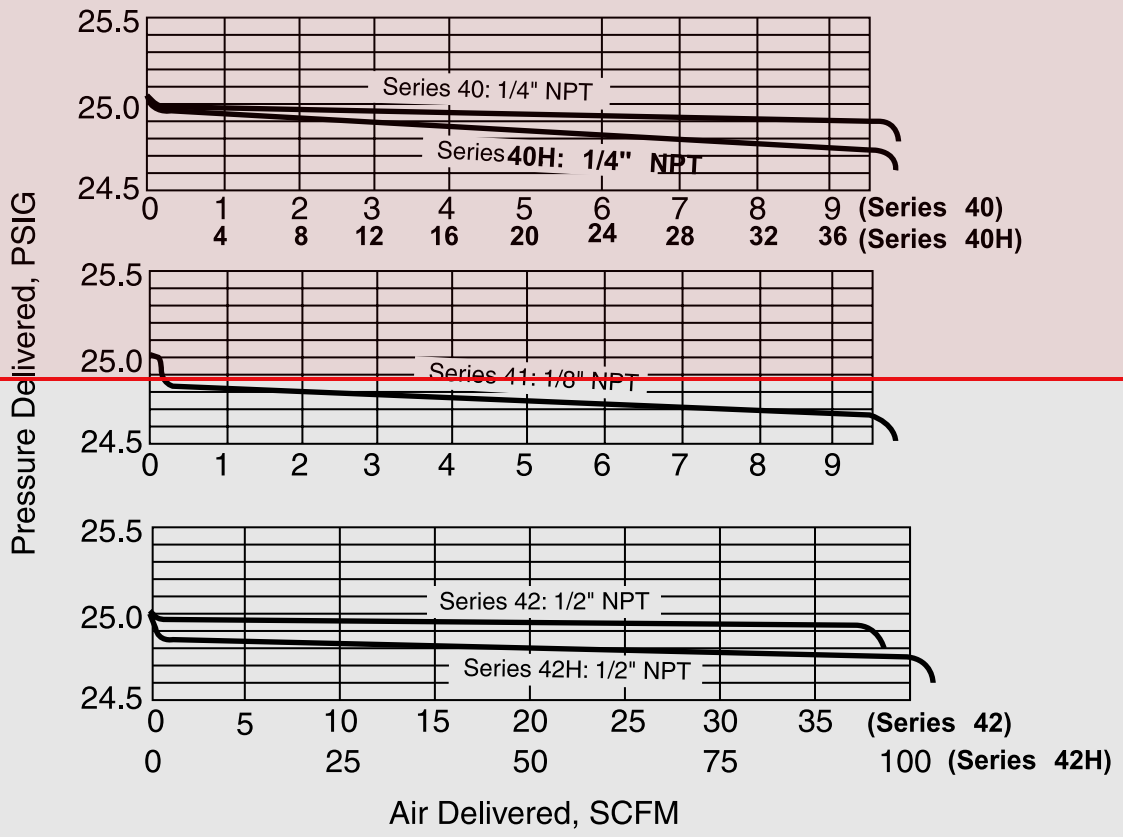
Deletion of Safety Release Valve (SRV)
The SRV increases exhaust flow capacity when the regulator must exhaust large flows. Deletion of the SRV will improve drift characteristics (see Graph 4). The SRV is not available with the Moore 41. It is standard with:
Model 40: 2, 7, 15, 30, 50 & H50 pressure ranges
Model 42: 15, 30, 50, H30, & H50 pressure ranges
To delete the SRV, add an [X] into the model number.
Example: 40X15

Slotted Adjusting Screw
Available for all models. This option provides for screw-driver adjustment of the regulator and includes a locknut.
Model 40: Add (M3) after the model number
Model 41: Add (M3) after the model number
Model 41: Add (M20) after the model number
Example: 40-15(M3)

Locknut with Longer Adjusting Screw
Available for all models. This option prevents inadvertent regulator adjustment.
Model 40: Add (M13) after the model number.
(Note: The Model 40-2 is standard with the lock nut.)
Model 41: Add (M5) after the model number or order accessory P/N 3603-22.
Model 42: Add (M3) after the model number
Example: 40-15(M3)

Bushings for mounting on panels up to 3/4" thick
(Standard maximum is 1/4" thick).
Model 40: Add (M41) after the model number
Model 41: Not available
Model 42: Add (M14) after the model number
Example: 40-15(M41)

Graph 1 Droop Effect



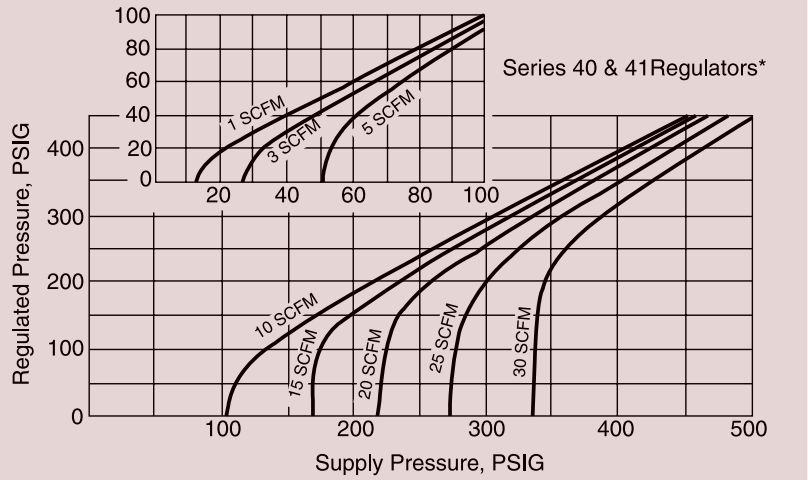
Test Procedure: Each 30-psig-range regulator was adjusted to 25 psig with 100 psig supply and no flow. Flow was increased to maximum capacity. All regulated pressure readings were taken at gauge connection in the body of the regulator.

Note: For performance curves on Model 40-2 and 40-7, request drawing # 1709-4 and 2155-72, respectively.

Models 40, 41, and 42 Precision Pressure Regulators

Technical data

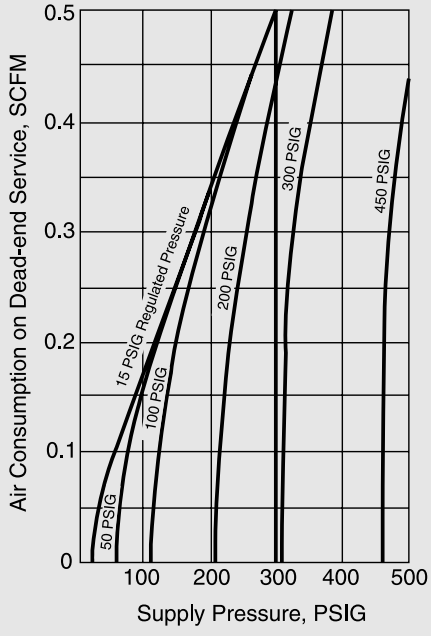
Graph 2 Maximum Air Flow, SCFM Delivered



* *Supply pressure for other models will be determined by multiplying the pressure(s) above by the flow values shown below:*

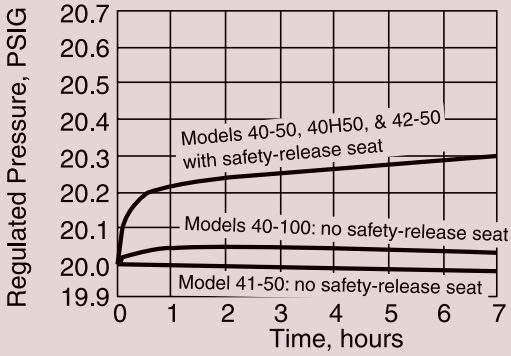
Model	Value
Model 40H	4.5
Model 42	4
Model 42H	14

Graph 3 Air Consumption



The Nullmatic regulator bleeds only the amount of air that passes through the pilot nozzle when there is no demand for output flow. The exhaust port starts to close as soon as the flow of regulated air is increased to the output, and it closes completely before the pilot-plunger valve opens. Full pilot flow is then delivered to the output.

Graph 4 Drift Effect



Test Procedure: Regulators were set at 20 psig output with 100 psig air supply. Supply was turned off for one week, after which supply was turned on at time 0.

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Model Selection

		Supply Pressure psig				Gauge (Opt.) Dia. Inches
Model No.	**Range psig[3]**	**Recommended**	**Maximum**	**Pipe Mtg.**	**Panel Mtg.**	**Standard Modifications**
40-2[1]	(1-50"H_2O)	5-10	25	3-1/2	3-1/2	E & X
40-7	(6-200"H_2O)	50	100	3-1/2	3-1/2	A, E & X
40-15	0.5-15	75	150	3-1/2	3-1/2	A, E & X
40-30	1-30	120	150	3-1/2	3-1/2	A, E & X
40-50	1-50	120	150	3-1/2[4]	3-1/2[4]	H, A, E & X
40-100	1.5-100	150	500	3-1/2	3-1/2	H, A & E
40-200	3-200	250	500	3-1/2	3-1/2	A & E
40-300	7-300	350	500	3-1/2	3-1/2	A & E
40-450	15-450	500	500	3-1/2	3-1/2	A & E
41-15	0.5-15	75	150	2[5]	3-1/2	A
41N15[2]	0.5-15	75	150	2[5]	3-1/2	
41-30	1-30	120	150	2	3-1/2	A
41-50	1-50	120	150	2[4]	3-1/2[4]	A
41-100	1.5-100	150	250	2	3-1/2	A
41-2550	25-50	120	150	2	3-1/2	
42-15	0.5-15	75	150	3-1/2	3-1/2	A, E & X
42-30	1-30	120	150	3-1/2	3-1/2	H, A, E & X
42-50	1-50	120	150	3-1/2[4]	3-1/2[4]	H, A, E & X
42-100	1.5-100	150	500	3-1/2	3-1/2	H, A & E
42-200	3-200	250	500	3-1/2	3-1/2	A & E

Standard Modifications
H - High flow capacity.
A - With pressure-tight top housing, containing 1/4" NPT connection for supplementary air loading.
E - With 1/8" NPT connection to collect exhaust when used with gases other than air.
X - Without safety release.

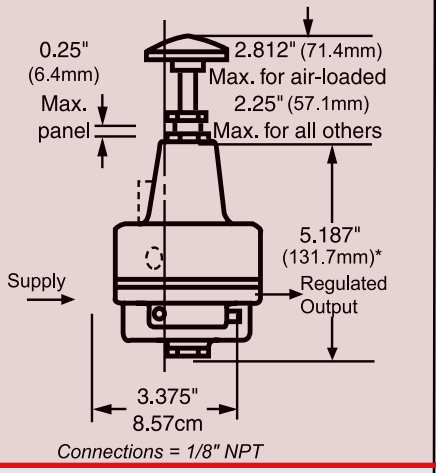
1) Includes locknut on adjusting stem (optional for all other models).
2) For use with Model 65 Square-Root Extractor to maintain minimum 3 psig output.
3) At recommended supply pressure.
4) With 0-60 psig dial range.
5) For pipe-mounting, 2" dia. gauge (0-30 psig) is available.

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Dimensional drawings

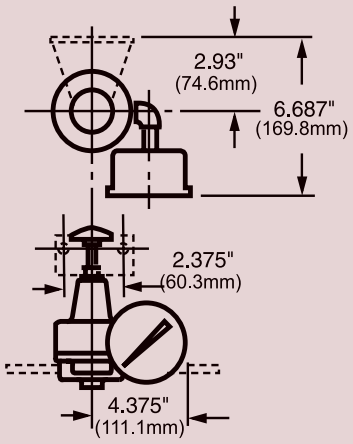
Mounting Dimensions

Model 40

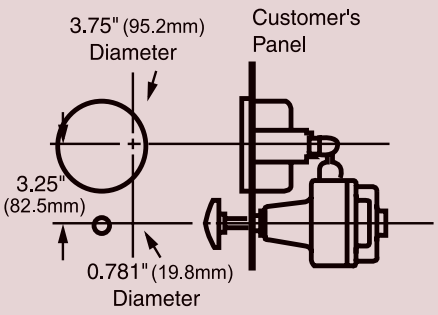


Connections = 1/8" NPT

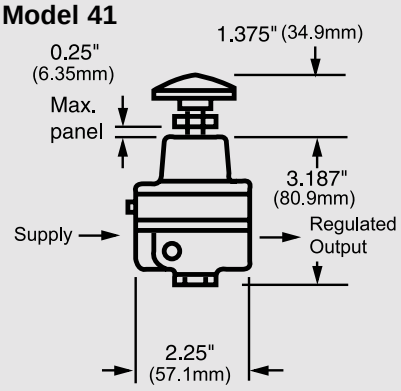
Pipe or Bracket-Mounted with Gauge



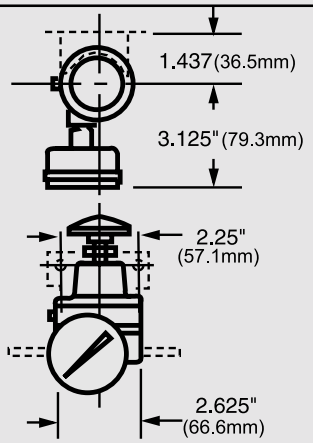
Panel-Mounting with Gauge

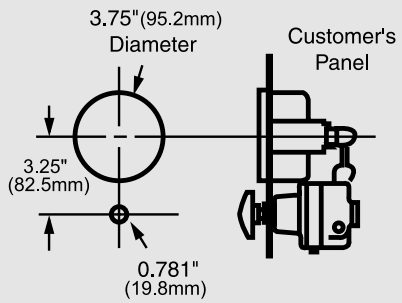


Model 41

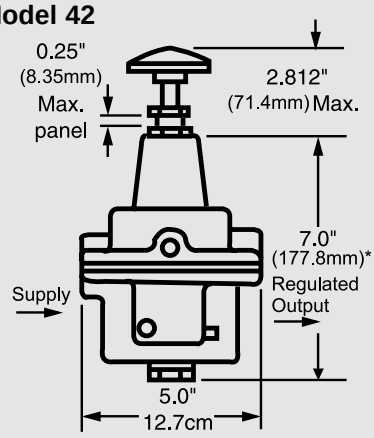


(Connections = 1/8")





Model 42



*Add 0.125" 0.31cm
for 200 psig Models
(Connections = 1/2" NPT)

