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Models 40, 41, and 42 Precision Pressure Regulators

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 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 4.5
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 80½C)

Ambient Temperature Effect

Approximately 1% of set pressure with standard range spring; for 50°F (27½C) 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

Models 40, 41, and 42 Precision Pressure Regulators

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 4.4

Standard Mounting

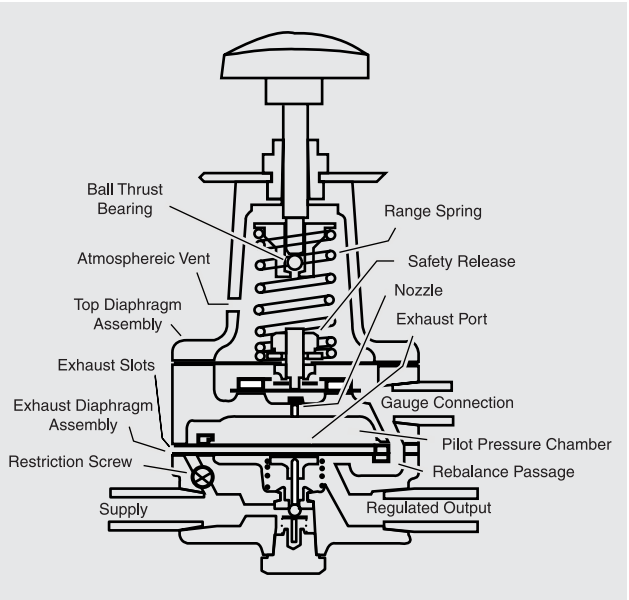
In-line pipe or flush panel up to 1/4" thick (bushing for 3/4" thick panel is optional)
Connections: (supply and outlet)
Model 40: 1/4" NPT
Model 41: 1/8" NPT
Model 42: 1/2" NPT

Materials of Construction (materials in contact with regulated media)

Brass, stainless steel, Neoprene, aluminum, and zinc

Accessories

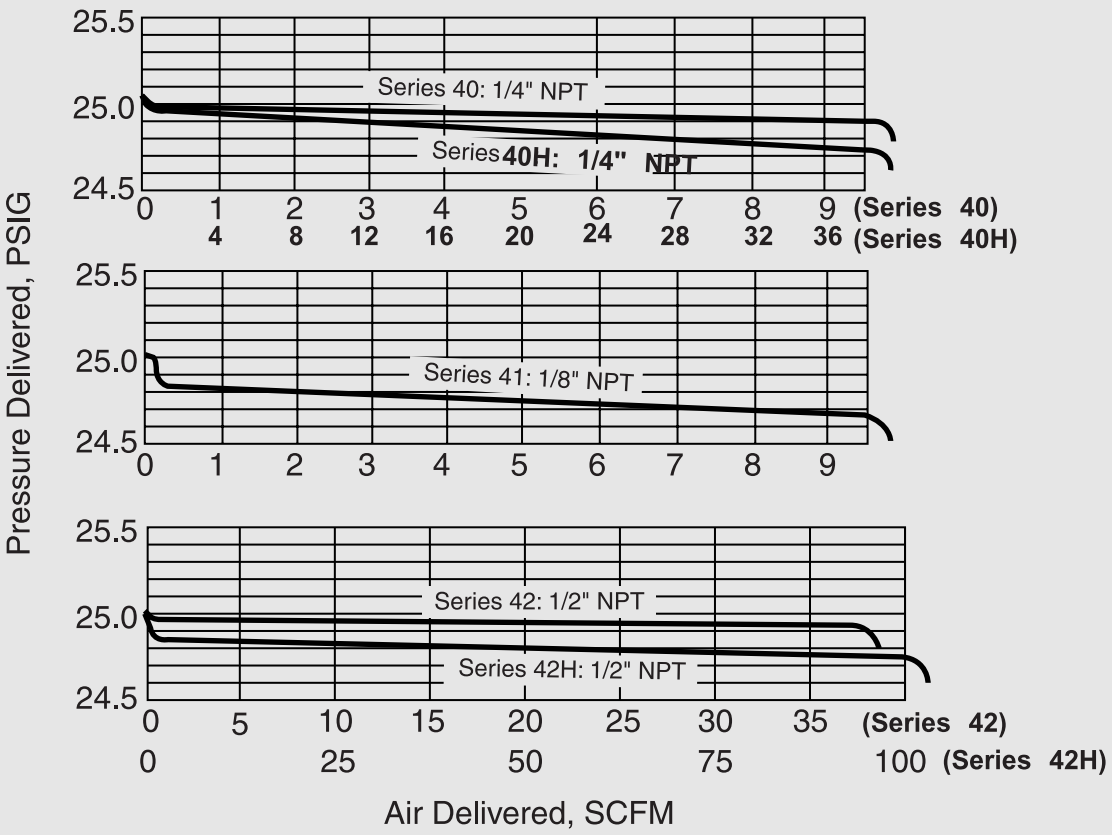
- P/N 2932-19 - Mounting Bracket for surface mounting (Model 40 and Model 42)
- P/N 10963-73 - Mounting Bracket for surface mounting (Model 41)
- P/N 3603-22 - Locknut



Options

- **Air Loading**
  Provision for supplementary air loading (100 psig max) in addition to spring loading
  Model 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 42: 1/8" NPT
  Model 40 & 41: Not available
  Add [E] into the model number.
  Example: 42E15
- **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 Seimens 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

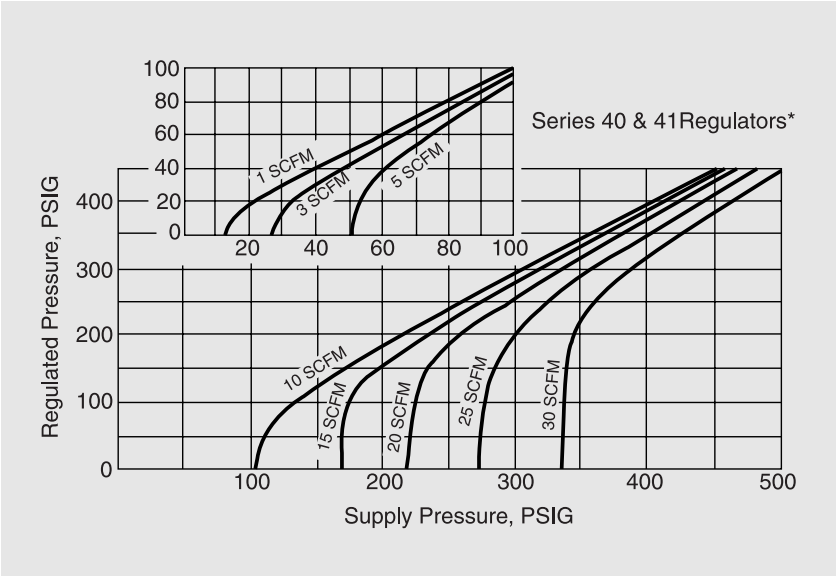
Graph 1 Droop Effect



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.

Technical data

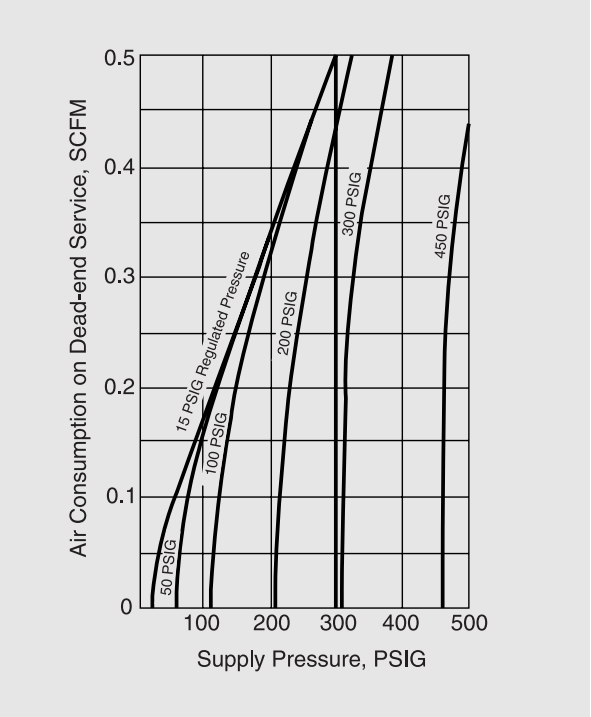
Graph 2 Maximum Air Flow, SCFM Delivered



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

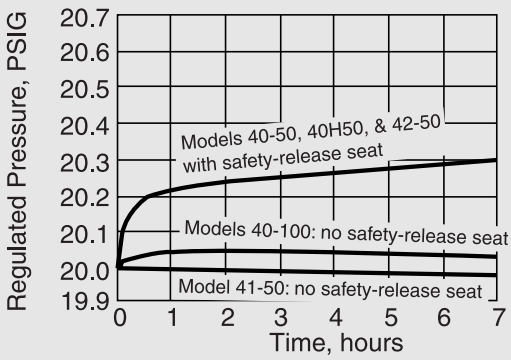
Model	Value
Model 40H	4.5
Model 42	4
Model 42H	14

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.

Model Selection

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

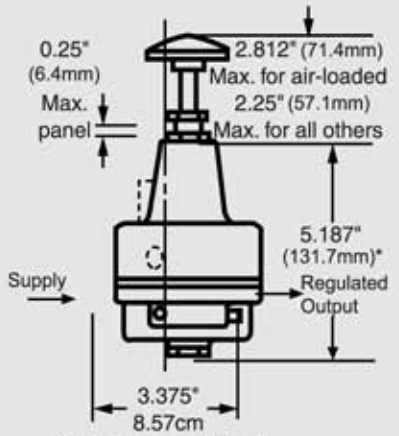
Standard Modifications
H - High flow capacity.
A - With pressure-tight top housing, containing 1/4" NPT connection for supplementary air loading.
E - With 1/8" NPT connection to collect exhaust
X - Without safety release.

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.

Dimensional drawings

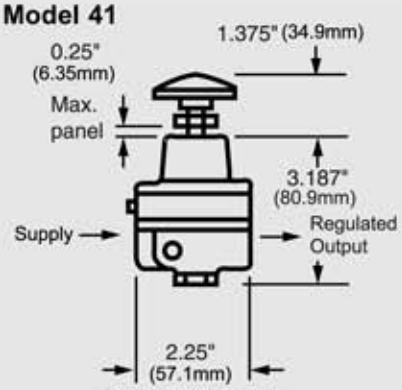
Mounting Dimensions

Model 40



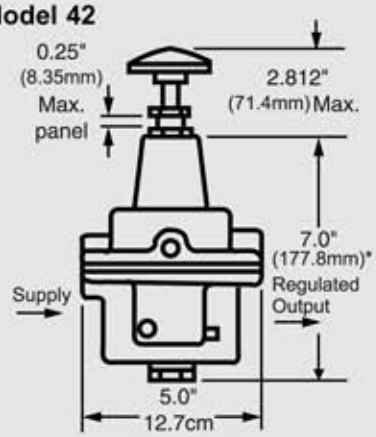
Connections = 1/8" NPT

Model 41



(Connections = 1/8")

Model 42



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

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