

# Type 100

## Precision Air Pressure Regulator

*Accurate, stable and dependable pressure regulation*

The Type 100 is a high precision, multi-stage pressure regulator. This pressure controller provides the highest level of regulation accuracy and repeatability available. The Type 100 is ideal for applications that call for the utmost in control and maximum stability under variable operating conditions. A stainless steel measuring capsule is used as a sensing element to activate the high gain servo balanced control mechanism in which the main valve is controlled by a pilot valve. This allows for greater accuracy and eliminates many of the problems associated with conventional regulators using range springs and diaphragms.

### FEATURES

- **Accurate Pressure Regulation**  
Controls output pressure to within 0.1% accuracy. Regulated pressure variation as small as 0.01 psig is self corrected
- **Stable Output**  
Substantial changes in flow have virtually no effect on regulated pressure from dead end to 12 SCFM.
- **Dependable Startup**  
Returns the regulated pressure to its original output setting even after long “down time”
- **High Relief Capacity**  
An optional high flow relief valve provides quick response when regulated pressure is reset to a lower value or when there is a large amount of system back pressure to be relieved
- **Temperature Stability**  
A stainless steel measuring capsule which activates the servo-control mechanism minimizes effects on regulated pressure by wide variations in operating temperature.
- **Locking Capability**  
Locking nut prevents inadvertent pressure adjustment



## Applications

The Type 100 is well suited for processes that require precise regulation of air pressure in pipes and vessels. The Type 100 is often used, but not limited to the following applications:

- |                                |                                |
|--------------------------------|--------------------------------|
| <b>Diagnostic Controls</b>     | <b>Medical Instrumentation</b> |
| <b>Precision Fluid Control</b> | <b>Ventilators</b>             |
| <b>Microfluidics</b>           | <b>Gate Actuators</b>          |
| <b>Air Gauging</b>             | <b>Roll Loading</b>            |
| <b>Gas Mixing</b>              | <b>Valve Operators</b>         |
| <b>Calibration Standards</b>   | <b>Cylinder Loading</b>        |
| <b>Air Hoists</b>              | <b>Web Tensioning</b>          |

## Models

**Type 100** Standard version relief—offered in three pressure ranges (2-40 psi, 2-60 psi, 2-120 psi) and three port sizes (1/8", 1/4", 3/8").

**Type 100HR** High relief capacity allows for quick “blow-down” capability for rapid exhaust of output pressure. Ideal for pneumatic counterbalance applications.

**Type 100LR** Low range capability provides accurate pressure regulation at lower output range. Operates with an output pressure range of 0.5 psig to 25 psig. Maximum supply pressure is 50 psig.

**Type 100PL** Linear actuation of a plunger controls regulated pressure rather than manual adjustment of a knob.

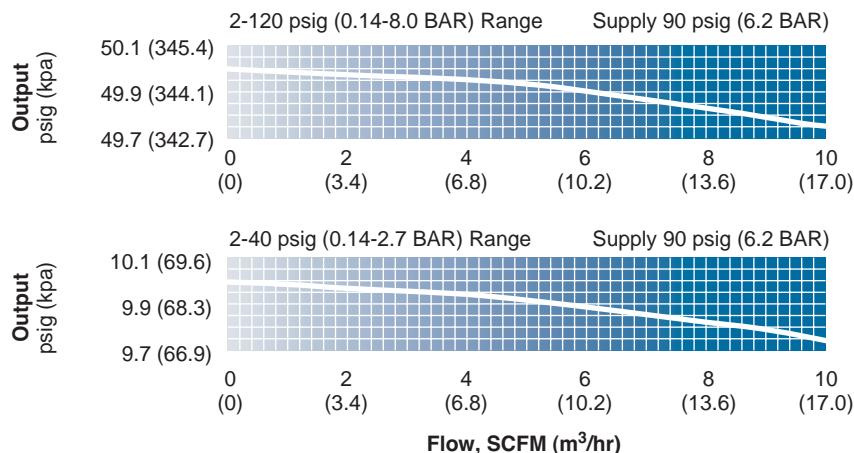
**Type 100BP** Bottom ported supply and output pressure, as well as four tapped mounting holes for manifold mounting. Suitable for applications with limited space.

**Type 100M** Motorized regulator. Regulation accuracy and sensitivity of the Type 100. See website for more information.

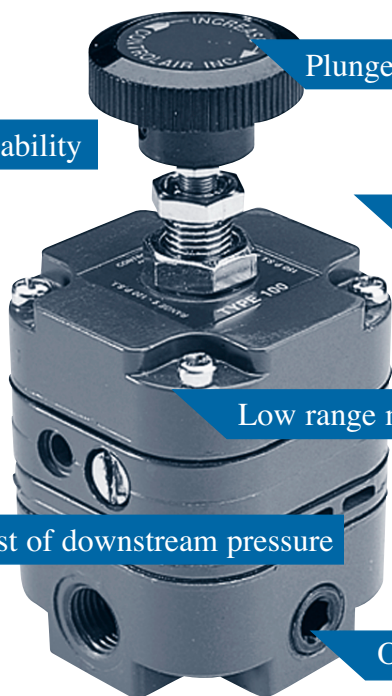
## TYPE 100 SPECIFICATIONS

<b>Flow Capacity</b>	14 scfm (25 m <sup>3</sup> /hr) at 100 psig (6.8 BAR) supply–20 psig (1.4 BAR) outlet
<b>Exhaust Capacity</b>	5 psig (0.4 BAR) above 20 psig (1.4 BAR) set point
Type 100	3 scfm (3.4 m <sup>3</sup> /hr)
Type 100 HR (High Relief)	11 scfm (17.0 m <sup>3</sup> /h.)
<b>Sensitivity</b>	1/8" (3.2 mm) water
<b>Pilot Pressure Chamber Bleed Rate</b>	less than 0.08 scfm (0.15m <sup>3</sup> /hr)
<b>Total Air Consumption</b>	6 scfh (.21m <sup>3</sup> /hr.)
<b>Effect of Supply Pressure Variation of 25 psig (1.7 BAR) on outlet</b>	less than .005 psig (0.3 kPa)
<b>Supply Pressure, Maximum</b>	150 psig (10.5 BAR)
<b>Materials:</b>	
Body;	diecast zinc alloy
Capsule and adjusting screw;	stainless steel
Assemblies;	stainless steel, brass, plated steel, acetal
Diaphragms;	Buna-N elastomer and polyester fabric
Knob;	phenolic plastic
<b>Weight</b>	1.4 lb (635 g)
<b>Port Sizes</b>	1/8", 1/4", 3/8" NPT
<b>Gage Ports (2)</b>	1/4" NPT
<b>Output Pressure Ranges</b>	2-40 psig (0.14-2.7 BAR) 2-60 psig (0.14-4 BAR) 2-120 psig (0.14-8 BAR)
<b>Mounting Options</b>	pipe, panel or optional bracket

## TYPE 100 FLOW CHARACTERISTICS



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Plunger operation or manual knob adjustment

Locking capability

Dependable start-up

Compact size

Low range model with output pressure below 2.0 psig

High relief model for fast exhaust of downstream pressure

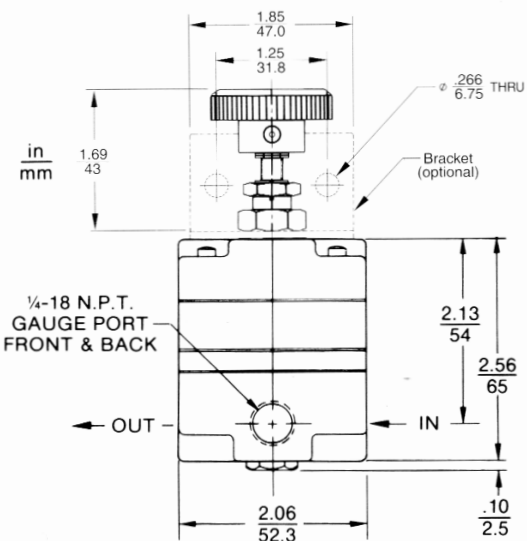
Optional bottom porting for manifold mounting

## Dimensions

### TYPE 100 REGULATOR

### TYPE 100HR HIGH RELIEF REGULATOR

### TYPE 100LR LOW RANGE REGULATOR

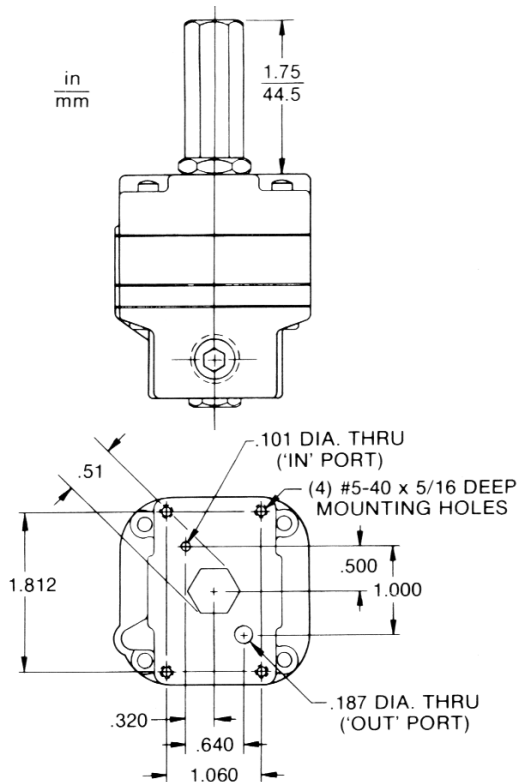


1/2" (12.7 mm) dia. hole for panel mounting;  
max. panel thickness, 1/2" (12.7 mm)

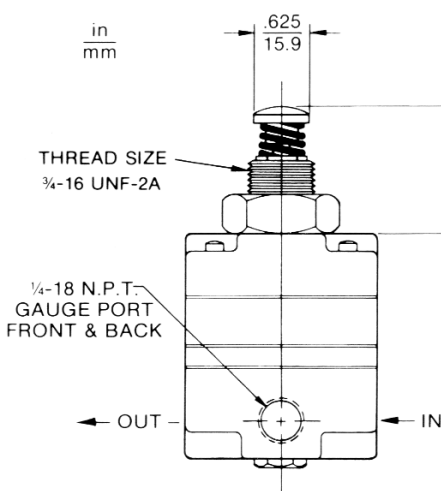
### TYPE 100BP BOTTOM PORTED REGULATOR

#### Tamperproof Cover

Type 100 BP shown with optional tamperproof cover  
(available with Type 100, Type 100HR and Type 100LR).



### TYPE 100PL PLUNGER OPERATED REGULATOR



#### Plunger Travel

Pressure Range psig (BAR)	Plunger Travel* in (mm)
2-40 (0.14-2.7)	.120 (3.0)
2-60 (0.14-4.1)	.90 (2.3)
2-120 (0.14-8.2)	.100 (2.5)

\* +/- 10% manufacturer tolerance

#### Return Spring

0.4 in. (10 mm) nominal return height; 7 oz. (200 g) approximate preload force. 7.5 lb./in. (135 g/mm) approximate spring rate, between 0.4 in. (10 mm) and .24 in. (6.5 mm) compressed height

# Type 100

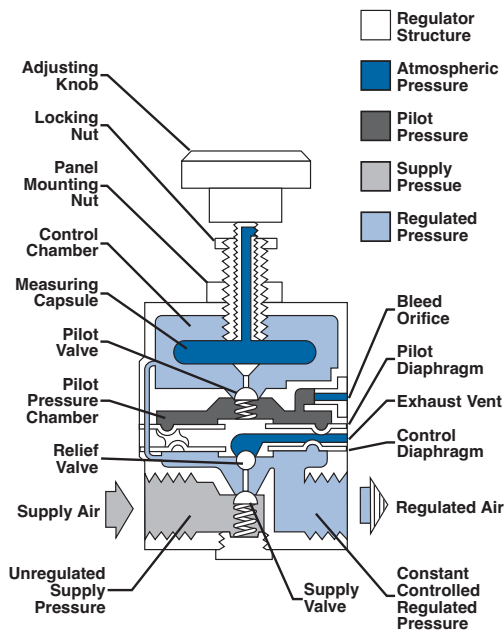
# Principles of Operation

# Ordering Information

# Type 100

The measuring capsule in the Type 100 is the sensing element that controls a high precision, balanced servomechanism. Stainless steel alloy construction gives the measuring capsule the ability to maintain forces over long periods of time without hysteresis. This eliminates problems associated with regulators that are controlled by a range spring. The downstream regulated pressure fills the control chamber and surrounds the measuring capsule. Expansion, contraction, or other slight movement of the capsule causes the pilot valve to open or close. This creates a substantial pressure change within the pilot pressure chamber. The change in pilot pressure is directly proportional to the downward force on the pilot diaphragm which causes the appropriate movement of the supply valve or relief valve and corrects any variation from set pressure. The high gain nature of this servomechanism allows the Type 100 to react to changes in set pressure as little as 0.01 psig.

Regulated pressure applies an upward force on the underside of the control diaphragm. When set pressure drifts above the set point the control diaphragm assembly moves upward and allows excess pressure to be vented out of the relief valve to atmosphere. The design of the relief valve permits substantial reverse flow capacity which quickly exhausts system back pressure thus eliminating the need for a separate relief valve.



### Warranty

ControlAir, Inc. products are warranted to be free from defects in materials and workmanship for a period of eighteen months from the date of sale, provided said products are used according to ControlAir, Inc. recommended usages. ControlAir, Inc.'s liability is limited to the repair, purchase price refund, or replacement in kind, at ControlAir, Inc.'s sole option, of any products proved defective. ControlAir, Inc. reserves the right to discontinue manufacture of any products or change products materials, designs or specifications without notice. Note: ControlAir does not assume responsibility for the selection, use, or maintenance of any product. Responsibility for the proper selection, use, and maintenance of any ControlAir product remains solely with the purchaser and end user.

Drawing downloads available at [www.controlair.com](http://www.controlair.com)

Type	Part Number	Port Size (NPT)	Output Range psig (BAR)
100	100-AA	1/8"	2-40 (0.14-2.7)
100	100-AB	1/8"	2-60 (0.14-4.1)
100	100-AC	1/8"	2-120 (0.14-8.2)
100	100-BA	1/4"	2-40 (0.14-2.7)
100	100-BB	1/4"	2-60 (0.14-4.1)
100	100-BC	1/4"	2-120 (0.14-8.2)
100	100-CA	3/8"	2-40 (0.14-2.7)
100	100-CB	3/8"	2-60 (0.14-4.1)
100	100-CC	3/8"	2-120 (0.14-8.2)
100HR	110-BC	1/4"	2-120 (0.14-8.2)
100HR	110-CC	3/8"	2-120 (0.14-8.2)
100LR	120-BA	1/4"	.5-25 (0.03-1.7)
100BP	140-BA	-	2-40 (0.14-2.7)
100BP	140-BB	-	2-60 (0.14-4.1)
100BP	140-BC	-	2-120 (0.14-8.2)
100PL	150-AA	1/8"	2-40 (0.14-2.7)
100PL	150-AB	1/8"	2-60 (0.14-4.1)
100PL	150-AC	1/8"	2-120 (0.14-8.2)
100PL	150-BA	1/4"	2-40 (0.14-2.7)
100PL	150-BB	1/4"	2-60 (0.14-4.1)
100PL	150-BC	1/4"	2-120 (0.14-8.2)
100PL	150-CA	3/8"	2-40 (0.14-2.7)
100PL	150-CB	3/8"	2-60 (0.14-4.1)
100PL	150-CC	3/8"	2-120 (0.14-8.2)

### Options

**Tamperproof Cover** - Add "T" at end of part number (See drawing for dimensions)

**Preset Pressure** - Output pressure can be preset at factory. (Consult factory for ordering information)

**Tapped Exhaust** - To order with a 10-32 tapped exhaust vent and barbed bleed screw, add an "E" to end of part number

**Oxygen Compatible** - Consult factory for ordering information

**BSP Porting** - To order with 1/4" BSP porting, add "U" to end of part number

### Accessories

Gauges	Part Number
0-15 psi	446-725-003
0-30psi	446-725-004
0-60 psi	446-725-001
0-160 psi	446-725-002
<b>Mounting Bracket</b>	446-707-045



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