

**2 YEAR**  
WARRANTY

# **Ω OMEGA™** **User's Guide**



PRG101



PRG501

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## **PRG101/PRG501** **Pressure Regulators**



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## GENERAL DESCRIPTION

The Omega PRG-501 and PRG501 Series Pressure Regulators have an advanced design consisting of a precision measurement capsule and a high gain servo amplifier to achieve high performance. The regulator can be used in a 'dead end' application and will exhaust whenever the setpoint is lowered. Changes in supply pressure have a minimal effect on the regulation accuracy. The regulator can be panel or pipe mounted. These regulators are unaffected by vibration and mounting position. A set point locknut is provided.

The PRG101 has two ¼ NPT gauge ports available for mounting OMEGA® pressure gauges for local indication. The PRG501 is ideal for having a dial gauge reading when the unit is panel mounted. The dial gauge would be external to the panel.

The PRG101 regulators are available in the following pressure ranges:

<b>Model No.</b>	<b>Adjustable Range</b>
PRG101-120	2-120 PSIG
PRG101-60	2-60 PSIG
PRG101-25	2-25 PSIG

The PRG501 regulators are available in the following pressure ranges:

<b>Model No.</b>	<b>Adjustable Range</b>
PRG501-120	2-120 PSIG
PRG501-60	2-60 PSIG
PRG501-30	2-30 PSIG
PRG501-X15	3-15 PSIG

## OPERATION

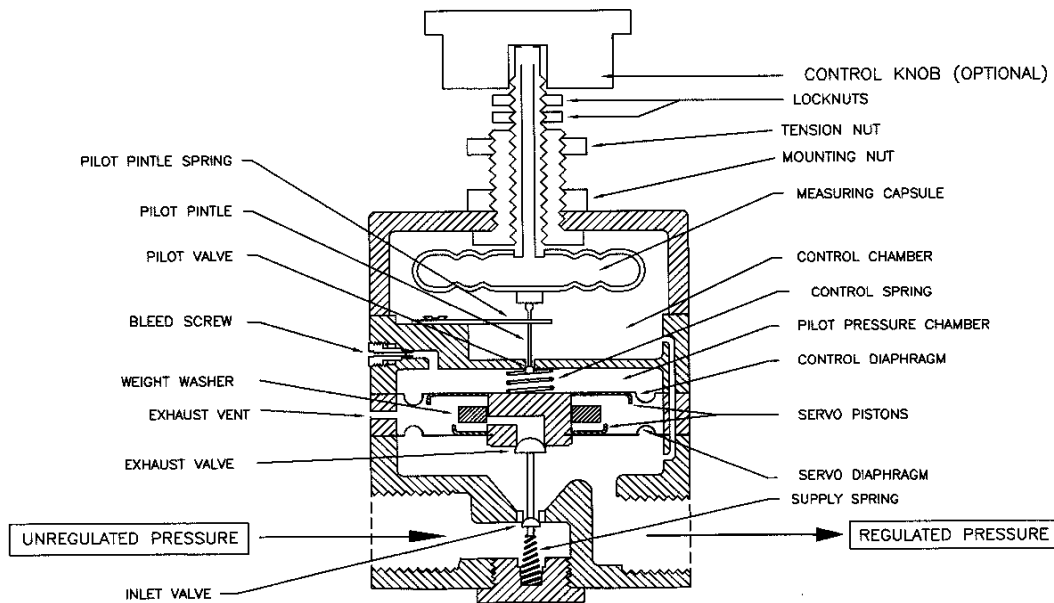
The PRG101 and PRG501 are precision pressure regulators, normally used with compressed air. The operation has been specifically designed for zero flow 'dead end' service, but can provide large air flows up to 5L/sec (10scfm) when required. It maintains a highly stable outlet pressure against variation in supply pressure, flow, temperature and vibration. These instruments use small quantities of air for operation (0.5-2 litres/minute) and can be set to a minimum below 0.14 bar (2psi). Tight shut off is not possible.

## BASIC MECHANISM

The units use a piston to control a high gain pneumatic two-stage servo system. When increasing the regulated pressure the handwheel is turned clockwise, forcing the measuring capsule/piston assembly downward. This pushes the pilot diaphragm and control diaphragm downward. As a result, the main valve opens and the supply pressure enters the regulator. The resulting pressure change causes the measuring capsule to compress. This compression causes the pilot diaphragm and the control diaphragm to move upward, which then shuts the main valve.

When decreasing the regulated pressure, the handwheel is turned counterclockwise, forcing the measuring capsule/piston assembly upward. This allows the pilot diaphragm and control diaphragm to move upward. As a result, the relief valve opens and air is exhausted through the vent. The resulting pressure drops causes the measuring capsule to expand. This expansion causes the pilot diaphragm and control diaphragm to move down, which then shuts the relief valve.

To maintain a state of equilibrium, the action of the measuring capsule as described above ensures a precise constant pressure regulation. Air is bled at a constant rate through the bleed orifice so that a very small movement of the pilot valve induces a substantial pilot pressure change, which creates a high servo amplification.



## INSTALLATION

### **Mounting**

The PRG101 is usually panel mounted into a minimum 11.5mm hole. Direct pipe mounting is also possible. To install on a panel remove the knob (grub screw) tension nut and mounting nut. Insert into the panel and replace the nuts and knob. The mounting nut should be retightened to a torque of 5Nm; set the tension nut to give adequate friction for the desired service. It is not necessary to remove the locknuts for installation; these may be reset if required to give a maximum pressure below the factory setting.

### **Pneumatics**

All pneumatics ports are threaded ¼” NPT. Two gauge ports may be used as required, and are supplied sealed with pipe plugs.

The following installation precautions are ESSENTIAL:

Air supply- This can be between limits of 0.2 bar (3 psi) above the maximum required outlet pressure and 10 bar (150psi). The air supply must be filtered to 25 micron, with oil content below 1ppm and dew point at least -10°C below lowest ambient temperature. Filtering and oil removal are vital for long life.

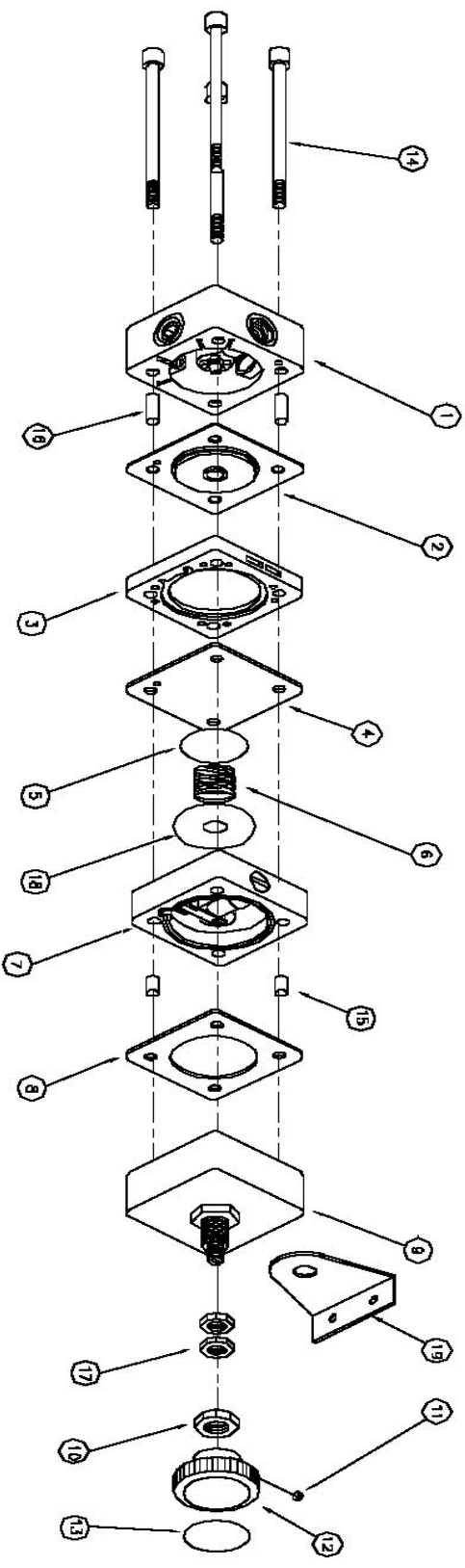
Pipe Fitting – Fit appropriate pipe fittings for the pipe sizes required. DO NOT USE PTFE TAPE. Thread sealing can be easily achieved with loctite hydraulic seal or similar anaerobic seals.

Pipe sizes – 6mm plastic tubes are commonly used, but increase to 8 or 10mm is desirable if long pipe runs of high flows are present. Plastic tubes (e.g. nylon) are convenient and clean.

## HEALTH AND SAFETY

The units are simple pressure control instruments and present few safety hazards. Installation should be in accordance with BS6739 or other relevant national standards. Compressed air can produce accidents if not correctly used and the user is urged to adhere to established compressed air safety standard.

These instruments contain no substance which presents hazards in normal use. The measuring capsule is constructed of beryllium copper, which can present disposal hazards; if a satisfactory disposal procedure is not available, scrap instruments should be returned to the factory.

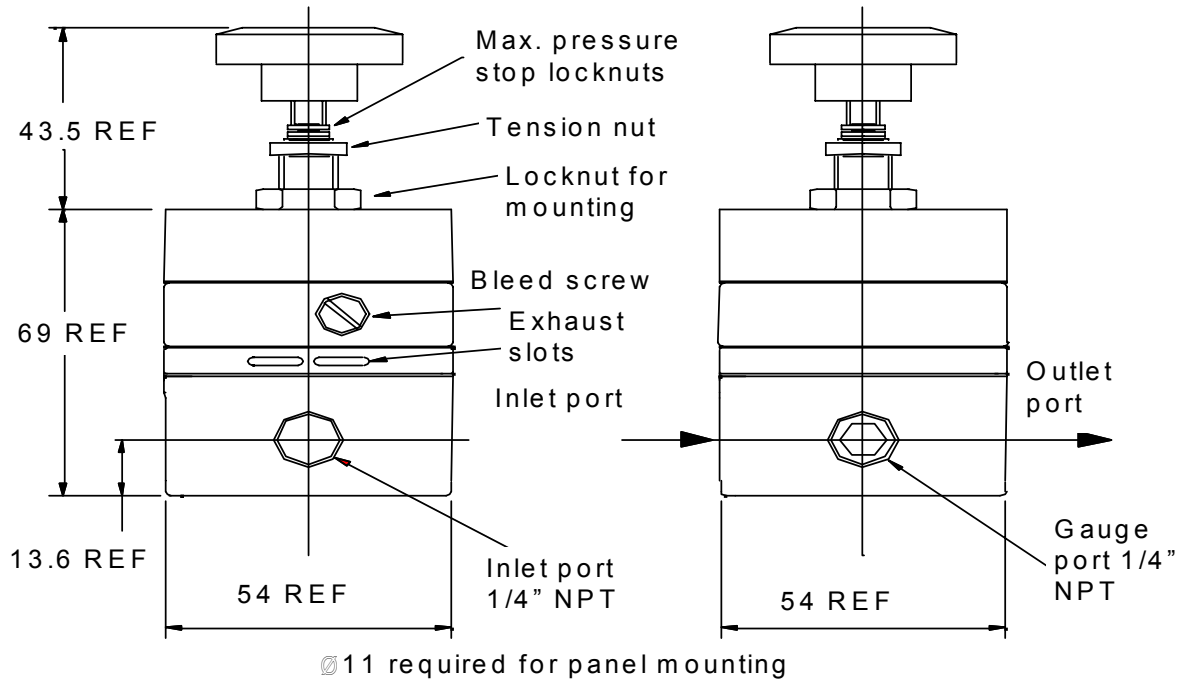


### OPERATION SEQUENCE

ASSEMBLE COMPONENTS AS SHOWN.

- |  |                                       |
|--|---------------------------------------|
| 1. BASE ASSEMBLY                             | 11. GRUB SCREW                        |
| 2. SERVO ASSEMBLY                            | 12. KNOB                              |
| 3. SPACER                                    | 13. INCREASE LABEL<br>STICK ON TO 12. |
| 4. CONTROL DIAPHRAGM                         | 14. M4 x 45 SCREW                     |
| 5. CONTROL DIAPHRAGM LABEL<br>STICK ON TO 4. | 15. ALIGNMENT BUSH (8mm).             |
| 6. CONTROL SPRING                            | 16. ALIGNMENT BUSH (12mm).            |
| 7. HOUSING ASSEMBLY                          | 17. LOCKING NUTS (1/4 x 40).          |
| 8. BONNET GASKET                             | 18. NOISE REDUCTION WASHER.           |
| 9. BONNET ASSEMBLY                           | 19. BRACKET (OPTIONAL).               |
| 10. TENSION NUT                              |                                       |

# DIMENSION DETAILS



## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **25 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **two (2) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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## RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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