

# Pneumatic Back Pressure Regulator

311595 rev.B

**Controls fluid pressure and flow in circulation systems.**



**Important Safety Instructions**

Read all warnings and instructions in this manual.  
Save these instructions.

*300 psi (2.1 MPa, 21 bar) Maximum Inlet Fluid Pressure*

*100 psi (0.7 MPa, 7 bar) Maximum Inlet Air Pressure*

*250 psi (1.72 MPa, 17.2 bar) Maximum Regulated Fluid Pressure*

*20 gpm (75 lpm) Maximum Flow Rate*

**Part No. 288117, 1-1/4 npt(f) inlet and outlet**

**Part No. 288262, 2 in. sanitary inlet and outlet**

**Part No. 288311, 1-1/2 npt(f) inlet and outlet**

**Part No. 15J498, Pneumatic Conversion Kit (see page 8)**



ti8553a

Canadian Registration Number (CRN): Ontario - OC11377.5






**PROVEN QUALITY. LEADING TECHNOLOGY.**

**Graco Inc. P.O. Box 1441 Minneapolis, MN 55440-1441**

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# Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

 <b>WARNING</b>	
	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> <li>• Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li> <li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Data</b> in all equipment manuals.</li> <li>• Use fluids and solvents that are compatible with equipment wetted parts. See <b>Technical Data</b> in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.</li> <li>• Do not alter or modify equipment.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>• Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>• Keep children and animals away from work area.</li> <li>• Comply with all applicable safety regulations.</li> </ul>
	<p><b>PRESSURIZED EQUIPMENT HAZARD</b></p> <p>Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</p> <ul style="list-style-type: none"> <li>• Follow <b>Pressure Relief Procedure</b> in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.</li> <li>• Tighten all fluid connections before operating the equipment.</li> <li>• Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.</li> </ul>
	<p><b>TOXIC FLUID OR FUMES HAZARD</b></p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> <li>• Read MSDS's to know the specific hazards of the fluids you are using.</li> <li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li> <li>• Always wear impervious gloves when spraying or cleaning equipment.</li> </ul>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b></p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> <li>• Protective eyewear</li> <li>• Clothing and respirator as recommended by the fluid and solvent manufacturer</li> <li>• Gloves</li> <li>• Hearing protection</li> </ul>

# Installation

## CAUTION

Handle the back pressure regulator with care to avoid damaging the diaphragm.

Install the back pressure regulator (A) in the spray gun fluid return line (B).

Connect the fluid return line to the inlet and outlet. Make sure the flow direction agrees with the IN and OUT markings on the regulator body.

Connect a regulated air supply line (C) to the air inlet of the back pressure regulator. The maximum air inlet pressure is 100 psi (0.7 MPa, 7.0 bar).


The back pressure regulator is adjustable to control the fluid pressures in a circulating system from 25-250 psi (.017-1.72 MPa, 1.7-17.2 bar).

### Key:

- A Pneumatic Back Pressure Regulator
- B Fluid Return Line
- C Back Pressure Regulator Air Supply Line
- D Air Regulator
- E Fluid Supply Line

If more than one spray station is used, install the back pressure regulator in the fluid supply line after the last station. This will help maintain proper circulating pressures in the system.

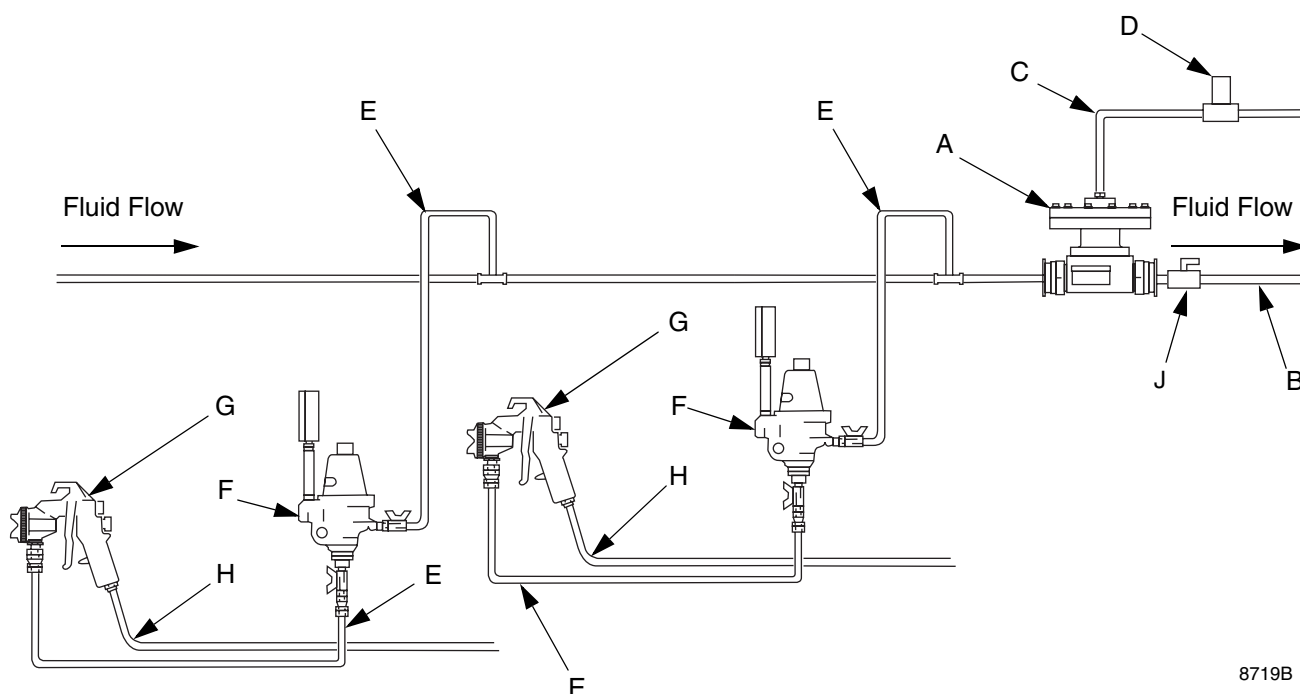
## Operation

 The back pressure regulator controls pressure ahead of its intake.

Adjust the air pressure regulator (D) to the desired back pressure. The air:fluid ratio is approximately 2.5:1; 100 psi inlet air pressure = 250 psi outlet fluid pressure). Do not exceed the maximum air pressure of 100 psi (0.7 MPa, 7.0 bar).

Flush the back pressure regulator with a compatible solvent whenever the rest of the system is being flushed. Adjust the air regulator to fully open the back pressure regulator when flushing.

- F Fluid Pressure Regulator
- G Air Spray Gun
- H Gun Air Supply Line
- J Fluid Shutoff Valve



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FIG. 1. Typical Installation

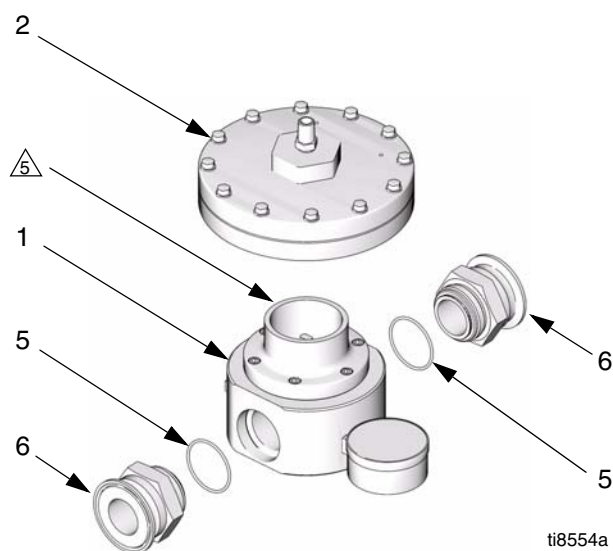
# Repair

## Back Pressure Regulator Repair



1. Relieve all system fluid pressure.
2. Shut off air to the back pressure regulator.
3. See FIG. 2. Unscrew the diaphragm housing (2) from the back pressure regulator (1).

△<sub>5</sub> Apply thread lubricant.



**FIG. 2. Separate Diaphragm Housing from Back Pressure Regulator**

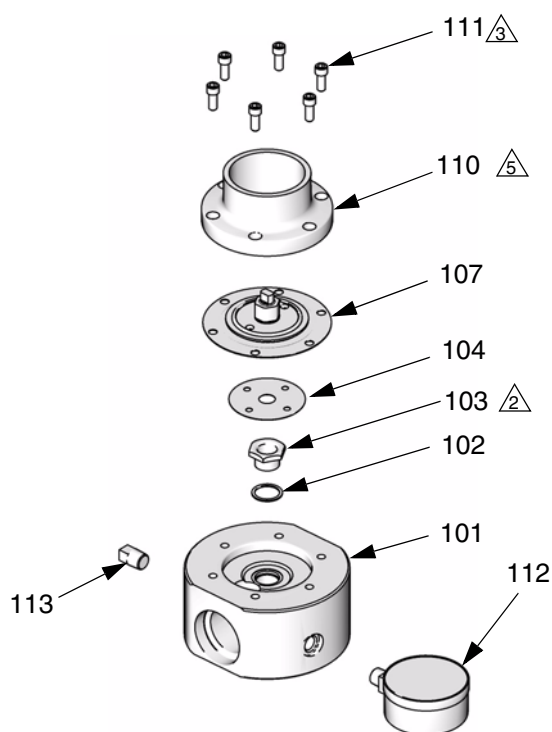
4. See FIG. 3. Remove the screws (111) and adapter (110) from the back pressure regulator housing.
5. Inspect the valve seat (103). If damaged, remove the seat and gasket (102). Install a new gasket (102) and torque the new seat to 15-20 ft-lb (21-27 N•m).
6. See FIG. 3. Install the diaphragm assembly.
7. Install the adapter (110) and screws (111). Torque the screws to 120-130 in-lb (13.6-14.7 N•m) oppositely and in sequence, three times.

8. Apply thread lubricant to the adapter (110). Screw the diaphragm housing (2) onto the adapter. Return the back pressure regulator to operation.

△<sub>2</sub> Torque to 15-20 ft-lb (21-27 N•m).

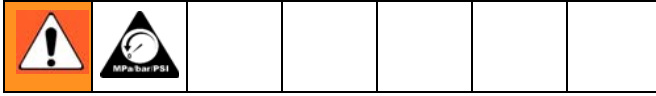
△<sub>3</sub> Torque to 120-130 in-lb (13.6-14.7 N•m) oppositely and in sequence, three times.

△<sub>5</sub> Apply thread lubricant.



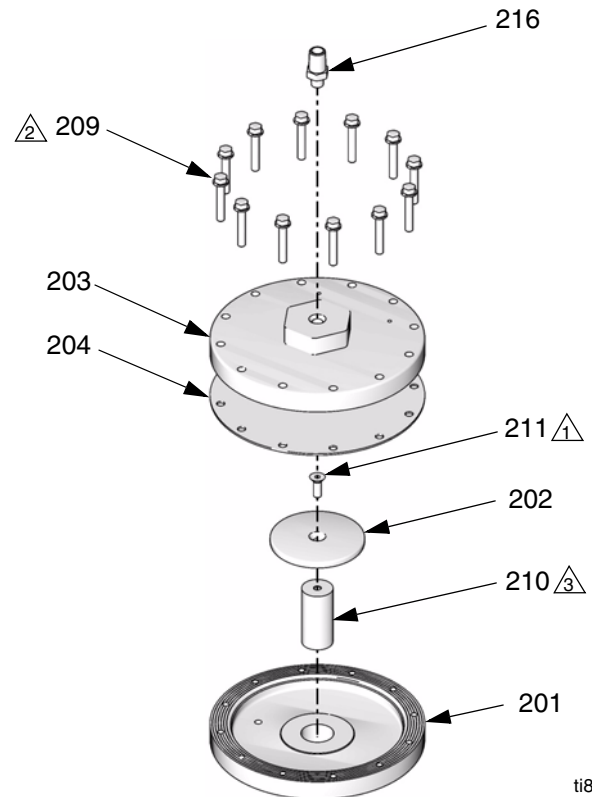
**FIG. 3. Back Pressure Regulator Repair**

## Diaphragm Repair



1. Relieve all system fluid pressure.
2. Shut off air to the back pressure regulator. Disconnect the air supply line from the inlet fitting (216).
3. See FIG. 4. Remove the screws (209) and cover (203). Remove the diaphragm (204).
4. Lift the piston rod assembly out of the housing (201). Inspect the piston rod (210) for damage. Disassemble the piston and replace parts as needed.
5. To reassemble the piston, apply thread sealant and torque the screw (211) to 75-80 in-lb (8.5-9.0 N•m). Lubricate the rod (210) and reinstall in the housing (201).
6. Install the new diaphragm (204).
7. Install the cover (203) and screws (209). Torque the screws to 30-33 in-lb (3.4-3.7 N•m) oppositely and in sequence, then retorque to 68-72 in-lb (7.7-8.1 N•m). Return the back pressure regulator to operation.

- ① Apply thread sealant and torque to 75-80 in-lb (8.5-9.0 N•m).
- ② Torque to 30-33 in-lb (3.4-3.7 N•m) oppositely and in sequence, then retorque to 68-72 in-lb (7.7-8.1 N•m).
- ③ Lubricate.



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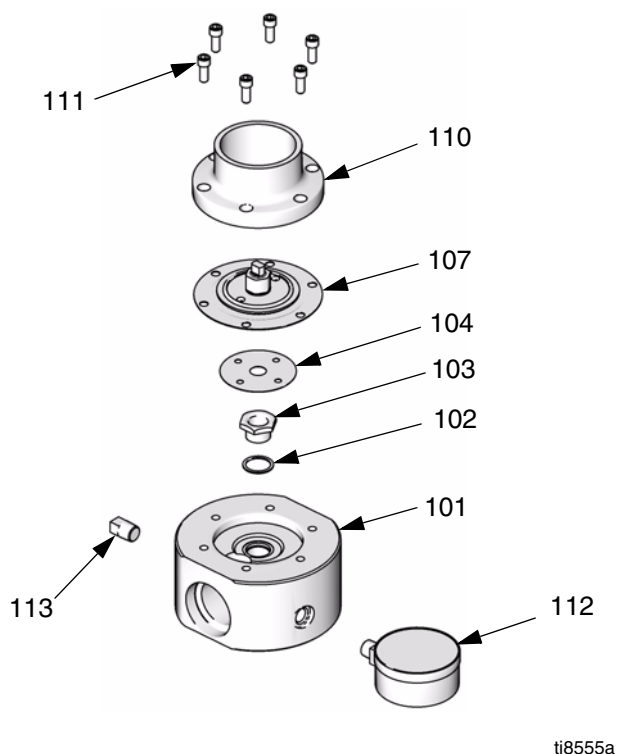
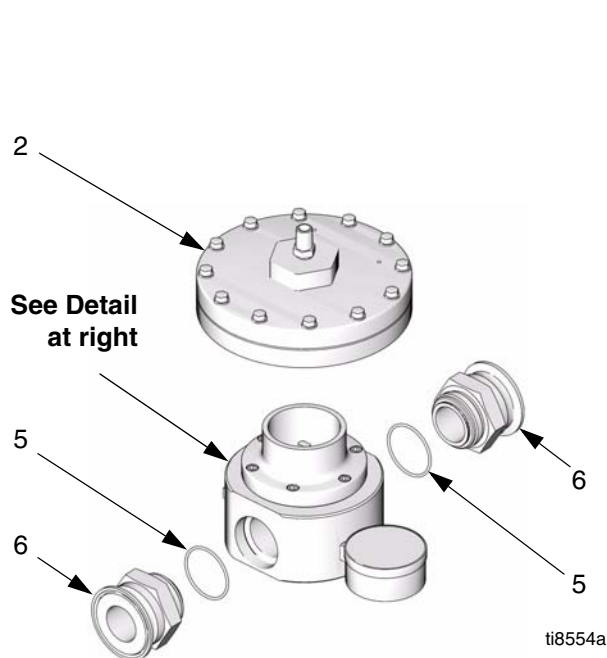
**FIG. 4. Diaphragm Repair**

# Parts

**Part No. 288117, 1-1/4 npt(f) inlet and outlet**

**Part No. 288262, 2 in. sanitary inlet and outlet**

**Part No. 288311, 1-1/2 npt(f) inlet and outlet**



Ref. No.	Part No.	Description	Qty
2†	288116	HOUSING, diaphragm; see page 7	1
5	107078	O-RING; used on 288262 and 288311	2
6	187004	FITTING; 1-7/8 un-2a x 2 in. sanitary; used on 288262	2
	187150	FITTING; 1-7/8 un-2a x 1-1/2 npt(f); used on 288311	2
101	187878	HOUSING; 1-1/4 npt(f) inlet and outlet; used on 288117	1
	15J421	HOUSING; 1-7/8 un(f) inlet and outlet; used on 288262 and 288311	1
102*†	171117	GASKET	1
103*†		SEAT, regulator; 17-4 sst	1
104*	171912	GASKET	1

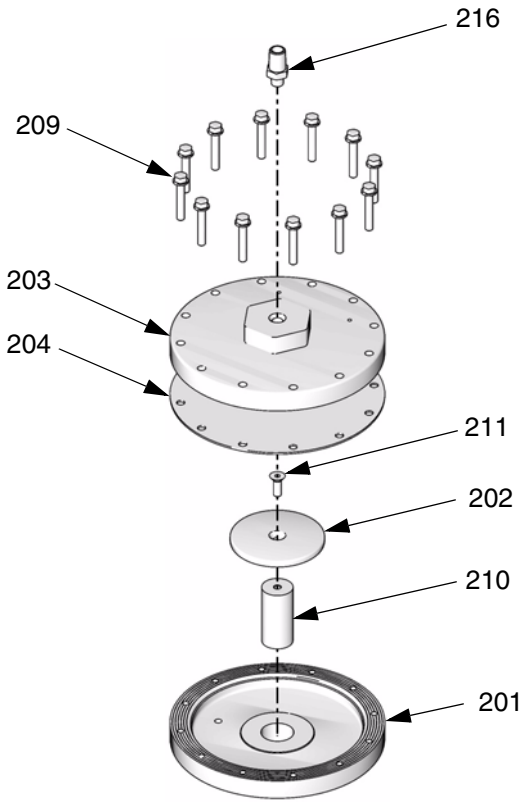
Ref. No.	Part No.	Description	Qty
107*†		KIT, repair, diaphragm; includes items 102 and 103; see available option below	1
110†	15H788	ADAPTER, regulator	1
111*†	101682	SCREW, cap, socket-hd	6
112	187873	GAUGE, pressure, fluid	1
113	111697	PLUG, pipe	1

\* Parts included in Stainless Steel Repair Kit 15J821 (purchase separately).

Optional 15J822 Carbide Repair Kit is also available:


† Parts included in Conversion Kit 15J498 (purchase separately), see page 8.

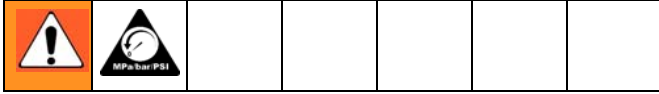
# Part No. 288116 Diaphragm Housing






Ref. No.	Part No.	Description	Qty
201	180980	HOUSING, diaphragm	1
202	15J461	WASHER, support	1
203	180981	COVER, diaphragm	1
204	180979	DIAPHRAGM	1
209	114104	SCREW, machine, hex wash hd	12
210	15H790	ROD, piston	1
211	103263	SCREW, machine	1
216	151519	FITTING, nipple, reducing	1

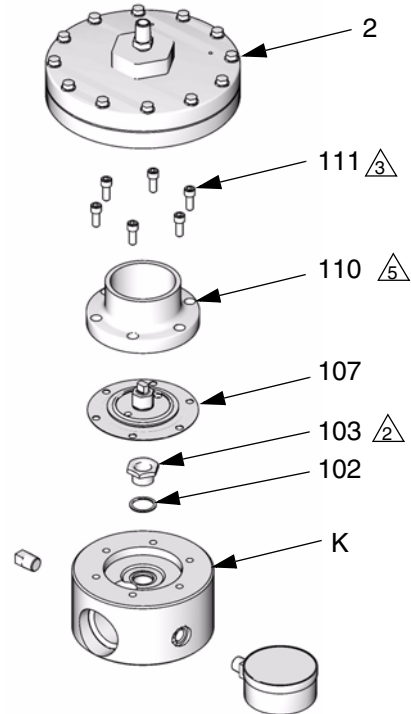
# 15J498 Conversion Kit

 15J498 Kit converts a 208997 spring-operated back pressure regulator to a pneumatic-operated regulator.



1. Relieve all system fluid pressure.
2. Remove the screws and cap from the existing back pressure regulator (see manual 307107).
3. Remove the spring, diaphragm, seat, and related parts from the regulator housing (K).
4. Clean the regulator housing (K).
5. See FIG. 5. Install the gasket (102) and torque the seat (103) to 15-20 ft-lb (21-27 N•m).
6. Install the diaphragm assembly.
7. Install the adapter (110) and screws (111). Torque the screws to 120-130 in-lb (13.6-14.7 N•m) oppositely and in sequence, three times.
8. Apply thread lubricant to the adapter (110). Screw the diaphragm housing (2) onto the adapter.
9. Follow **Installation** and **Operation** instructions on page 3.

-  2 Torque to 15-20 ft-lb (21-27 N•m).
-  3 Torque to 120-130 in-lb (13.6-14.7 N•m) oppositely and in sequence, three times.
-  5 Apply thread lubricant.



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**FIG. 5. 15J498 Conversion Kit**



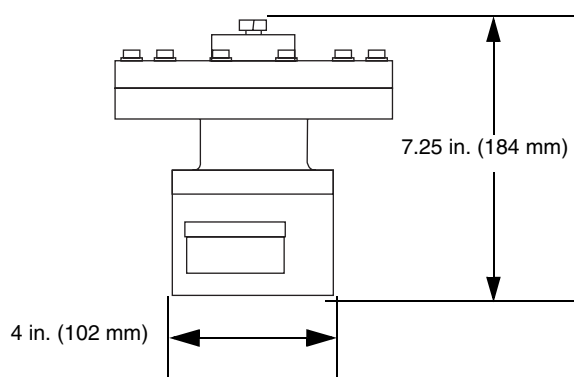
## Dimensions

### Back Pressure

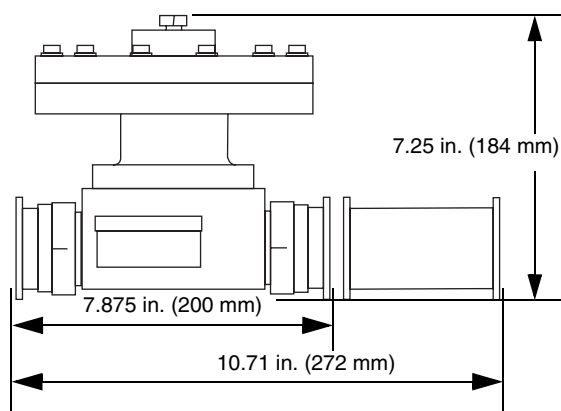
#### Regulator Fluid Inlet/Outlet Size

288117	1-1/4 npt(f)
288262	2 in. sanitary
288311	1-1/2 npt(f)

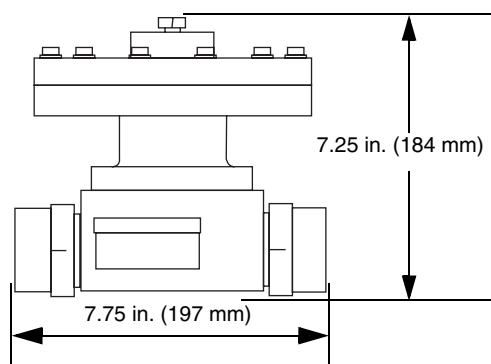
#### 288117 BPR



#### 288262 BPR, with 120755 Adapter (accessory)



#### 288311 BPR



## Technical Data

Maximum fluid inlet pressure	300 psi (2.1 MPa, 21 bar)
Maximum air inlet pressure	100 psi (0.7 MPa, 7 bar)
Regulated pressure range	25-250 psi (.017-1.72 MPa, 1.7-17.2 bar)
maximum flow rate	20 gpm (75 lpm)
Fluid inlet/outlet size	See chart at left
Gauge port size	1/4 npt(f)
Air inlet size	1/4 npt(m)
Weight	8.5 lb (3.9 kg)
Wetted parts	303 and 316 stainless steel, acetal
<i>Diaphragm: nylon fabric base with impregnated buna-N, fluid side PTFE coated</i>	

# Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

**THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

**GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO.** These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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# Graco Information

**TO PLACE AN ORDER,** contact your Graco distributor or call to identify the nearest distributor.

**Phone:** 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

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**Graco Headquarters:** Minneapolis  
**International Offices:** Belgium, China, Japan, Korea

**GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1441**

[www.graco.com](http://www.graco.com)

1/2007 Revised 3/2007