

Low Flow Fluid Regulator

3A0427D

EN

Pneumatic controlled fluid regulator provides accurate, positive pressure control of finishing coatings in low flow applications. For professional use only.

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

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

90 psi (0.63 MPa, 6.3 bar) Maximum Regulated Fluid Pressure (High Pressure Port, All Models)

Part No. 24C375, Series A

Part No. FXRG1X and FXRG1T

1:1 Ratio, 90 psi (0.63 MPa, 6.3 bar) Maximum Regulated Fluid Pressure (Low Pressure Port)

Part No. 24E471, Series A

Part No. FXRG2X and FXRG2T

1:2 Ratio, 50 psi (0.35 MPa, 3.5 bar) Maximum Regulated Fluid Pressure (Low Pressure Port)

Part No. 24E472, Series A

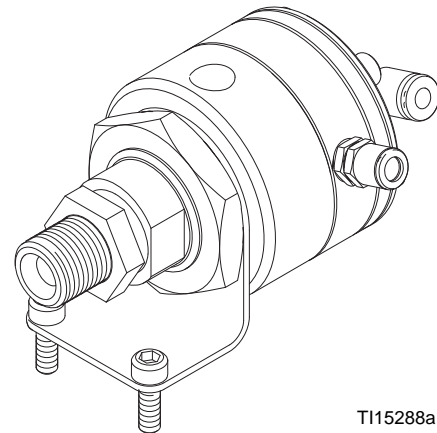
Part No. FXRG3X and FXRG3T

1:3 Ratio, 30 psi (0.21 MPa, 2.1 bar) Maximum Regulated Fluid Pressure (Low Pressure Port)



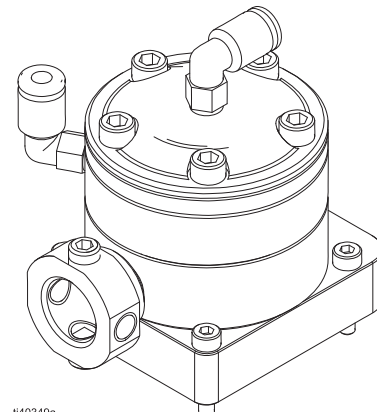
Important Safety Instructions

Read all warnings and instructions in this manual before using the equipment.
Save these instructions.



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24C375, 24E471, and 24E472



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FXRG1X, FXRG2X, and FXRG3X (w/o transducer fitting)
FXRG1T, FXRG2T, and FXRG3T (w/transducer fitting)

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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 symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 <h2 style="margin: 0;">WARNING</h2>	
   	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well-ventilated area. • Eliminate all ignition sources, such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking). • Ground all equipment in the work area. See Grounding for instructions. • Never spray or flush solvent at high pressure. • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive. • Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
  	<p>PRESSURIZED EQUIPMENT HAZARD</p> <p>Fluid from the equipment, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</p> <ul style="list-style-type: none"> • Follow the Pressure Relief Procedure when you stop spraying/dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.

WARNING

 	<p>EQUIPMENT MISUSE HAZARD Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See , page 16, in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See , page 16, in all equipment manuals. Read fluid and solvent manufacturer’s warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer’s replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	<p>TOXIC FLUID OR FUMES HAZARD 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"> • Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
	<p>PERSONAL PROTECTIVE EQUIPMENT Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Installation

Mount the Fluid Regulator

See FIG. 1. Mount the fluid regulator (C) in a location close to the fluid dispense device. A mounting bracket (D) is supplied. See **Dimensions** on page 15 for mounting information.

Grounding



Mount the regulator to a conductive mounting surface (E) which is connected to a true earth ground. Follow local code. Graco Part No. 222011 Ground Wire and Clamp is available as an accessory. See FIG. 1.

Air Supply

The regulator's air inlet fittings accept 5/32 in. (4 mm) OD tubing. Air pressure can be controlled manually or with electronic pressure controls.

Connections can be made in two ways:

- Use separate high (A) and low (B) air pressure supply lines, connected as shown in FIG. 1.
- Use a single air supply line and connect it to the high or low pressure air inlet fitting alternately, as desired.

Fluid Inlet Line

See FIG. 1. Connect the fluid inlet line (G) between the 1/4 npt(m) fluid inlet fitting and the fluid supply.

Install the following accessories in the order shown in FIG. 1, using adapters as necessary.

- **Fluid filter (H):** to filter particles from the fluid before it passes through the fluid regulator.
- **Fluid drain valve (J):** required in your system, to relieve fluid pressure in the fluid regulator.
- **Fluid shutoff valve (K):** shuts off fluid flow.

Regulated Fluid Outlet Line

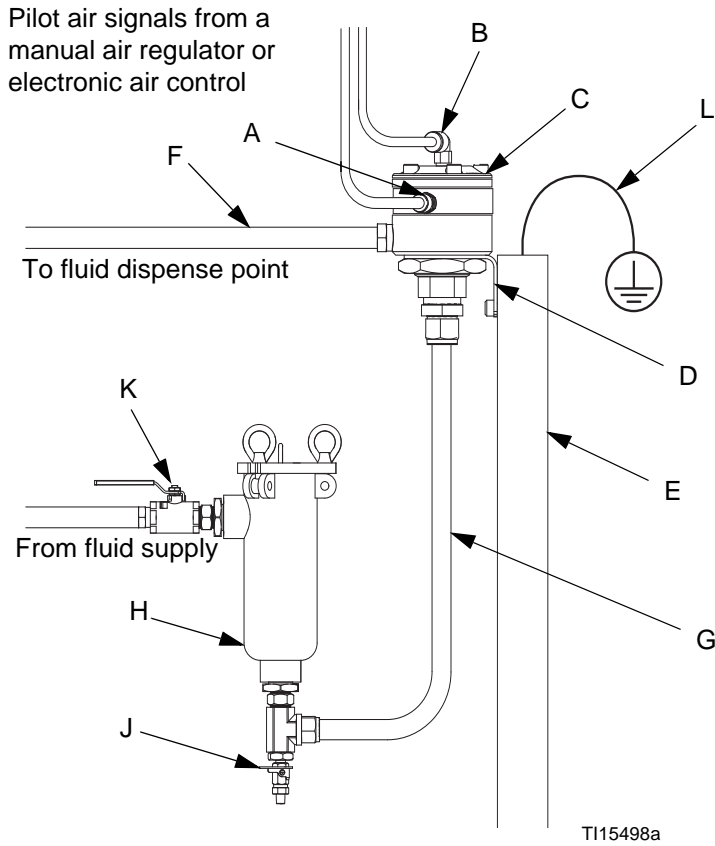
See FIG. 1. Connect the regulated fluid outlet line (F) between the 1/8 npt(f) fluid outlet port and the system's fluid dispense point.

NOTE: All components located downstream of the fluid regulator must be rated for the maximum fluid inlet pressure sent to the regulator. Do not use the regulator as a fluid shutoff valve.

Flush Before Using Equipment

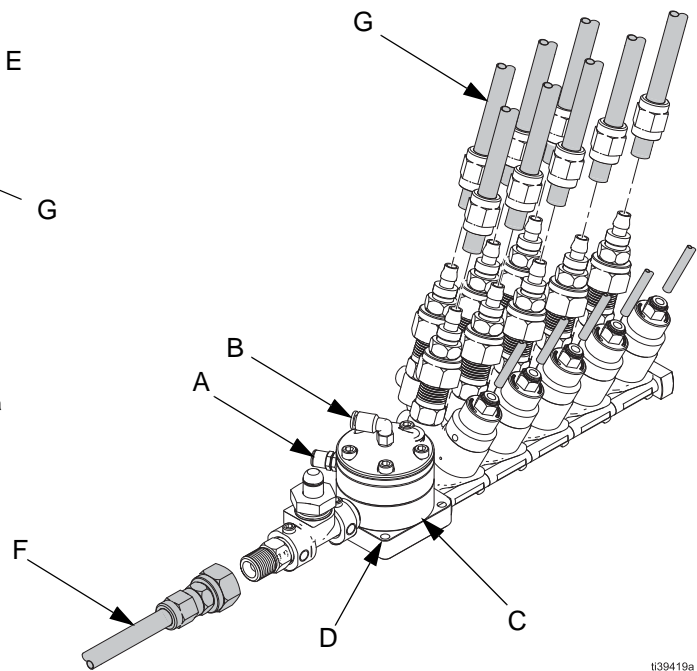
The equipment was tested with a rust inhibiting test fluid. To avoid contaminating your system, flush the equipment with a compatible solvent before using the equipment. See **Flush the Equipment**, page 9.

Installation



Installation with a 24C375, 24C471, or 24E472 regulator.

Installation with an IniFlex™ FXRG regulator. See the IniFlex manual (3A8637) for more IniFlex information.



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FIG. 1: Typical Installation

Key:

- | | |
|-------------------------------|---|
| A Air High Inlet Port | G Fluid Inlet Supply Line |
| B Air Low Inlet Port | H Fluid Filter |
| C Low Flow Fluid Regulator | J Fluid Drain Valve (required) |
| D Mounting Bracket (supplied) | K Fluid Shutoff Valve |
| E Grounded Mounting Surface | L Ground Wire and Clamp (Part No. 222011) |
| F Regulated Fluid Outlet Line | |

Operation

Pressure Relief Procedure



Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as splashing fluid, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

1. Shut off the fluid supply.
2. Leave on the air to the fluid regulator.
3. Trigger the gun to relieve the fluid pressure.
4. Shut off the air supply to the fluid regulator.
5. Open the fluid drain valve to relieve all fluid pressure, having a container ready to catch the drainage.

Available Pressures

This fluid regulator provides accurate, positive fluid pressure control to a spray gun or other device. The regulated fluid outlet pressure is proportional to the pilot air signal supplied to either the high or low air inlet port. Each port can be controlled independently.

All three models have the high pressure port, which is fixed at 1:1. Ratios of 1:1, 1:2, and 1:3 are available for low pressure applications. The ratio spacer (3, FIG. 2) is color coded to indicate ratio:

- Silver (1:1 ratio)
- Green (1:2 ratio)
- Black (1:3 ratio)

See the **Performance Data** on pages 17 and 18 to help determine which ratio is best for your application. Performance is affected by:

- Fluid inlet pressure
- Fluid viscosity
- Size (ID) and length of the regulated fluid outlet line
- Size (ID) and length of the fluid inlet supply line.

Air High Inlet Port Operation

Use the air high inlet port for:

- commanding a higher pressure for faster flushing
- higher fluid viscosities

To operate, shut off the air to the low pressure inlet and turn on the air to the high pressure inlet.

Air Low Inlet Port Operation

Use the air low inlet port for:

- precise control in critical applications
- lower fluid viscosities

To operate, shut off the air to the high pressure inlet and turn on the air to the low pressure inlet.

Adjust the Fluid Regulator

The fluid regulator controls pressure downstream from its outlet. Set the inlet fluid pressure at least 10 psi (.07 MPa, 0.7 bar) higher than the regulated outlet fluid pressure.

Apply a pilot air signal to either the air high or air low inlet port. The minimum air pressure depends on the ratio. See the **Performance Data** on pages 17 and 18.

If using an accessory fluid pressure gauge, trigger the air spray gun to relieve pressure in the line when reducing the pressure, to ensure a correct gauge reading.

Flush the Equipment



To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure.

- Flush before changing colors, at the end of the day, before storing, and before repairing the equipment.
- Flush with a fluid that is compatible with the fluid you are pumping and with the wetted parts of your system. Check with your fluid manufacturer or supplier for recommended flushing fluids and flushing frequency. Relieve the pressure after flushing.
- Do not allow paint or solvent to sit in the system for extended periods.

Troubleshooting



Follow the **Pressure Relief Procedure**, page 8, before checking or repairing the equipment.

To repair the regulator, refer to **Repair** on page 11.

Problem	Cause	Solution
No fluid flow.	Plugged fluid inlet.	Flush fluid line and regulator.
	Exhausted fluid supply.	Check fluid supply and supply pump.
	No air inlet pressure.	Check air inlet pressure.
	Ruptured air diaphragm (15).	Replace. See page 11.
	Ruptured fluid diaphragms (9a, 9b).	Replace. See page 11.
Low fluid flow.	Incorrect ratio.	Use correct spacer (3) and ratio piston (14) for desired ratio. See Change the Ratio , page 11.
	Fluid supply pressure is too low.	Increase fluid pressure. Do not exceed 300 psi (2.1 MPa, 21 bar).
	Air inlet pressure is too low.	Increase air inlet pressure.
High fluid flow.	Incorrect ratio.	Use correct spacer (3) and ratio piston (14) for desired ratio. See Change the Ratio , page 11.
	Air inlet pressure is too high.	Decrease air inlet pressure.
Erratic fluid flow.	Damaged fluid diaphragms (9a, 9b).	Replace. See page 11.
	Ruptured air diaphragm (15).	Replace. See page 11.
	Ruptured fluid diaphragms (9a, 9b).	Replace. See page 11.
	Inconsistent air inlet pressure.	Check air inlet pressure.
	Inconsistent fluid inlet pressure.	Check fluid inlet pressure.
Fluid flow will not shut off.	Dirty needle (6) and seat (5).	Remove and clean. Replace if worn or damaged. See page 11.
	Inlet air is not shut off.	Shut off inlet air.
	Seat retainer (7) is loose.	Tighten.
	Broken spring (13).	Replace spring (13). See page 11.
Regulator is leaking fluid.	Screws (17) are loose.	Torque oppositely and alternately to 25 in-lb (2.8 N•m).
	Ruptured fluid diaphragms (9a, 9b).	Replace. See page 11.
	Loose fluid fitting.	Tighten.
Regulator is leaking air.	Loose air fitting.	Tighten.
	Screws (17) are loose.	Torque oppositely and alternately to 25 in-lb (2.8 N•m).
	Ruptured air diaphragm (15).	Replace. See page 11.

Repair



Disassembly

1. Flush the regulator with a compatible solvent. See page 9.
2. Follow the **Pressure Relief Procedure** on page 8.
3. Disconnect the air and fluid lines from the regulator. Remove the regulator for repair.
4. Remove the fluid inlet fitting (20). (For IniFlex™, remove the four screws (31).) See FIG. 2.
5. Remove five screws (17), the air chamber cover (4), air diaphragm (15), spacer (3), and gasket (29).
6. Unscrew the ratio piston (14). Remove the spring (13) and air chamber housing (2).
7. Insert a standard screwdriver into the fluid inlet of the regulator and hold the regulator needle (6) steady. Unscrew the air chamber piston (10).
8. Remove the fluid diaphragms (9a, 9b), o-ring (11), and fluid chamber piston (8). Push the needle (6) out of the fluid chamber housing (1) inlet port.
9. Using a 5/16 allen wrench, unscrew the seat retainer (7) and seat (5) from the fluid chamber housing (1).
10. Clean all parts and inspect for damage.

Reassembly

NOTE: Rebuild Kit 24E504 is available. See page 13 to order. Kit parts are marked with an asterisk, for example 9a*. For the best results use all parts in the kit.

NOTE: Seat Repair Kit 24F140 is available. See page 13 to order. Kit parts are marked with a symbol, for example 7♦. For the best results use all parts in the kit.

1. Using a 5/16 allen wrench, screw the seat retainer (7*♦) and seat (5*♦) into the fluid chamber housing (1).

NOTE: The white ptfе diaphragm (9a*) must always face the fluid. Install the white ptfе diaphragm first, followed by the black nylon/buna-N diaphragm (9b*).

2. Insert the needle (6♦) in the fluid chamber housing (1). Hold in place with a screwdriver or allen wrench. Install the fluid chamber piston (8), o-ring (11*), ptfе diaphragm (9a*), and nylon/buna-N diaphragm (9b*).
3. Apply thread sealant to the threads of the needle (6). Screw the air chamber piston (10) onto the needle. Align the holes in the diaphragms before tightening. Tighten using a screwdriver in the slot of the needle.
4. Install the air chamber housing (2). Align the holes in the housing with the holes in the diaphragms (9a, 9b) and fluid chamber housing (1).
5. Install the spring (13). Screw the ratio piston (14) into the air chamber piston (10).
6. Install the gasket (29*), spacer (3), air diaphragm (15*), and air chamber cover (4). Align the holes. Install five screws (17). (For IniFlex, install the o-ring (36), align the holes between the fluid chamber housing (1) and the fluid inlet block (32), and install four screws (31).) Torque oppositely and alternately to 25 in-lb (2.8 N•m).
7. Apply pipe sealant and install the fluid inlet fitting (20).
8. Reinstall the fluid regulator in the system.

Change the Ratio

Ratio Kits 24E501, 24E502, and 24E503 are available to change the ratio. See page 13 to order. Kit parts are marked with a symbol, for example 3†. The kits include a spacer (3†) and piston (14†). The ratio spacer is color coded to indicate ratio:

- Silver (1:1 Ratio Kit 24E501)
- Green (1:2 Ratio Kit 24E502)
- Black (1:3 Ratio Kit 24E503)

To install the kit, disassemble the regulator (see page 11). Replace the existing spacer (3) and ratio piston (14) with the desired size, and reassemble. Do not mix spacers and pistons of different sizes.

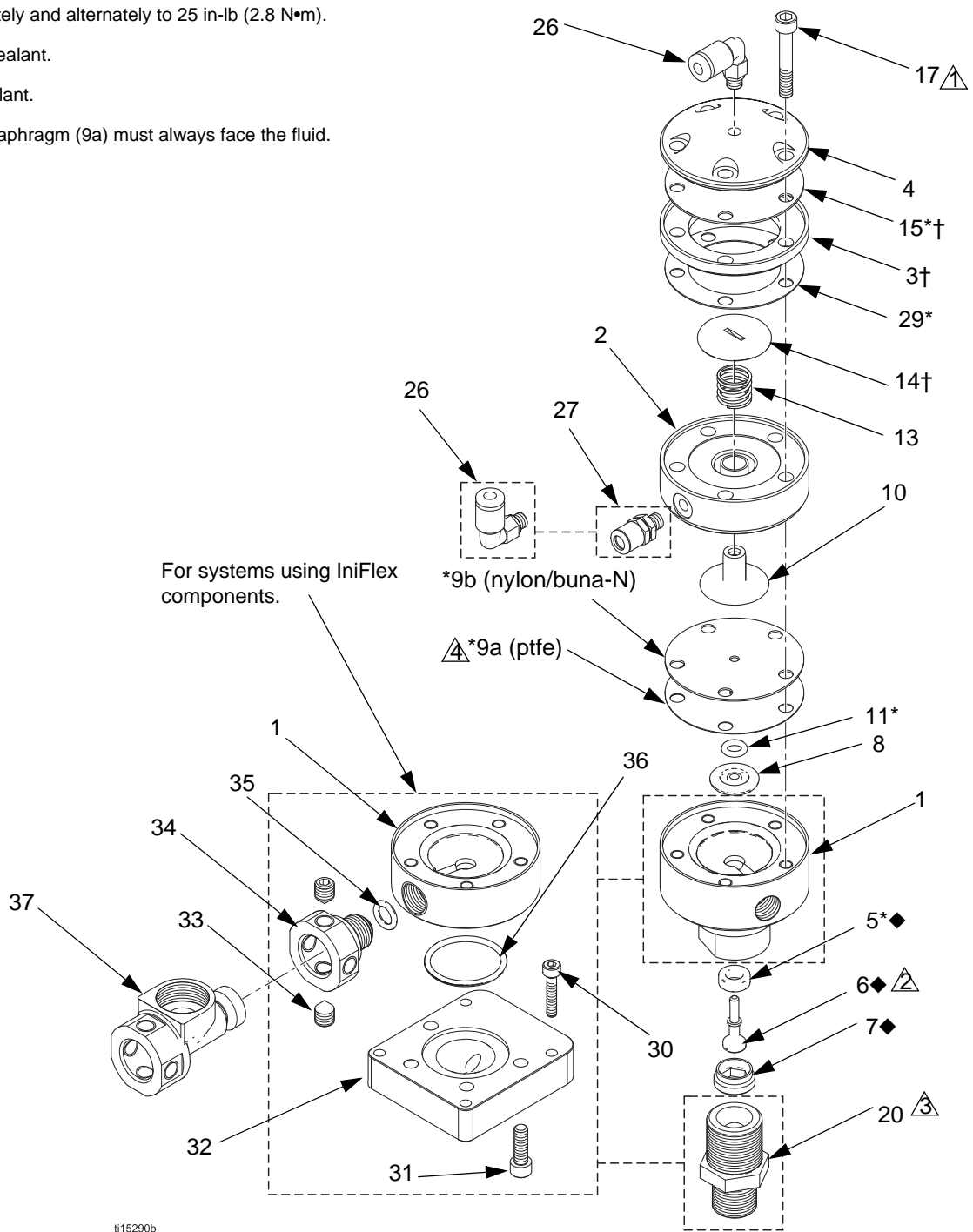
Repair

⚠ Torque oppositely and alternately to 25 in-lb (2.8 N•m).

⚠ Apply thread sealant.

⚠ Apply pipe sealant.

⚠ White PTFE diaphragm (9a) must always face the fluid.



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FIG. 2. Regulator Assembly

Parts

24C375 1:1 Ratio Fluid Regulator, Series A 24E471 1:2 Ratio Fluid Regulator, Series A 24E472 1:3 Ratio Fluid Regulator, Series A

Ref. No.	Part No.	Description	Qty.
1	n/a	HOUSING, fluid chamber 24C375, 24E471, 24E472 FXRG1, FXRG2, FXRG3	1
2	n/a	HOUSING, air chamber	1
3†	n/a	SPACER, ratio, 1:1, silver (24E472, FXRG3 only)	1
	n/a	SPACER, ratio, 1:2, green (24E471, FXRG2 only)	1
	n/a	SPACER, ratio, 1:3, black (24E472, FXRG3 only)	1
4	n/a	COVER, air chamber	1
5*◆	n/a	SEAT, regulator	1
6◆	n/a	NEEDLE, regulator	1
7◆	n/a	RETAINER, seat	1
8	16A585	PISTON, fluid chamber	1
9a*	n/a	DIAPHRAGM, fluid; ptfe (white)	1
9b*	n/a	DIAPHRAGM, fluid; nylon/buna-N (black)	1
10	16A586	PISTON, air chamber	1
11*	n/a	O-RING; perfluoroelastomer	1
13	16E537	SPRING, compression; sst	1
14†	n/a	PISTON, ratio, 1:1 (24C375, FXRG1 only)	1
	n/a	PISTON, ratio, 1:2 (24E471, FXRG2 only)	1
	n/a	PISTON, ratio, 1:3 (24E472, FXRG3 only)	1
15*†	n/a	DIAPHRAGM, air; buna-N	1
17	n/a	SCREW, cap, socket hd; 8-32 x 1 in. (25 mm); sst	5

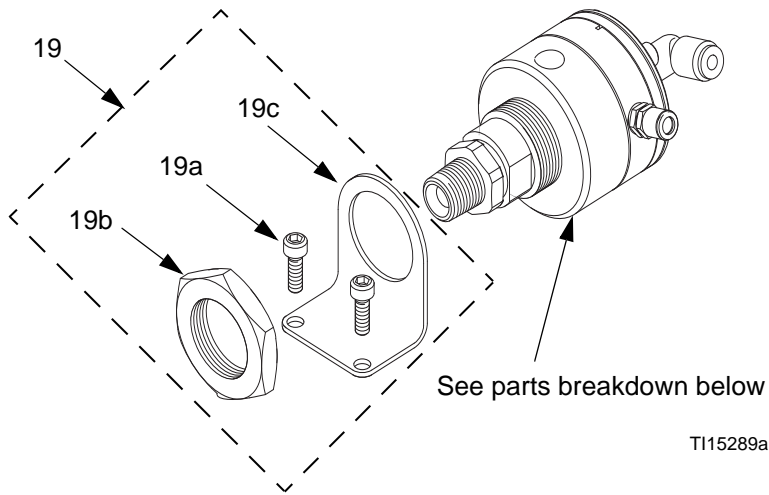
FXRG1 1:1 Ratio Fluid Regulator, IniFlex FXRG2 1:2 Ratio Fluid Regulator, IniFlex FXRG3 1:3 Ratio Fluid Regulator, IniFlex

Ref. No.	Part No.	Description	Qty.
19	16A746	KIT, bracket, regulator; includes items 19a, 19b, and 19c; (used only with models 24C375, 24E471, and 24E472)	1
19a	n/a	SCREW, cap, socket hd; 8-32 x 1/2 in. (13 mm)	2
19b	n/a	NUT, hex; 1-12 unf-2B	1
19c	n/a	BRACKET, mounting	1
20	n/a	FITTING, fluid inlet; 1/4 npt x 3/8 npt; sst	1
26	n/a	ELBOW, tube, air; 10-32(m) x 5/32 in. (4 mm) OD tube	1
27	n/a	CONNECTOR, tube, air; 10-32(m) x 5/32 in. (4 mm) OD tube	1
29*	n/a	GASKET, cellulose fiber	1
30	n/a	SCREW, cap, socket hd; M3-0.5 x 16 mm, sst	4
31	n/a	SCREW, cap, socket hd; M3-32 x 0.5 lg, sst	4
32	n/a	BLOCK, fluid inlet	1
33	131517	SETSCREW, cone point M6 x 1	2
34	18C941	FITTING, adapter, quick socket	1
35	104893	O-RING	1
36	117559	O-RING	1
37	18C942	HOUSING, transducer, quick socket (optional)	1

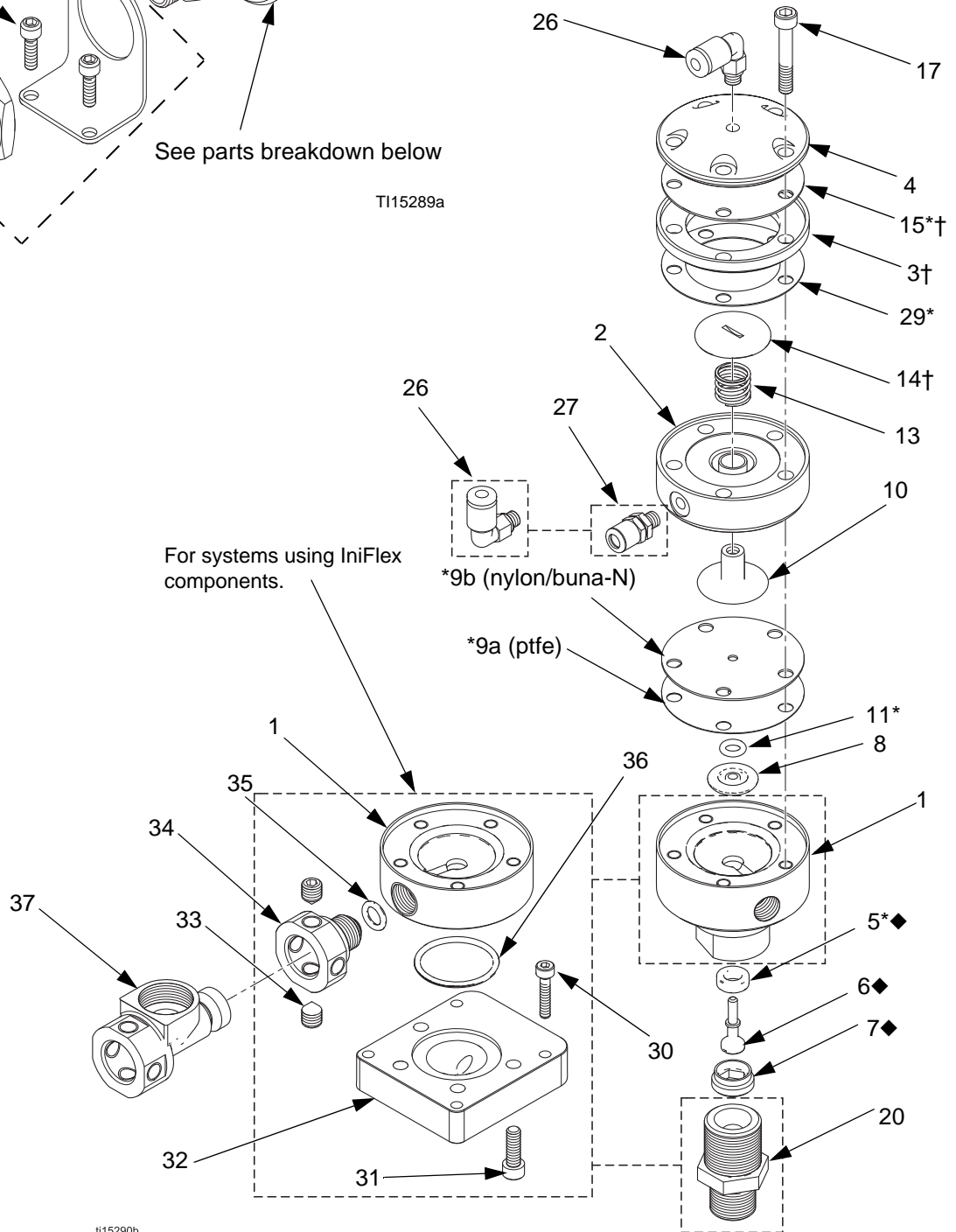
* *Parts included in Rebuild Kit 24E504 (purchase separately).*

† *Parts included in Ratio Kits (purchase separately):
24E501, 1:1 Ratio (silver spacer)
24E502, 1:2 Ratio (green spacer)
24E503, 1:3 Ratio (black spacer)*

◆ *Parts included in Seat Kit 24F140 (purchase separately).*

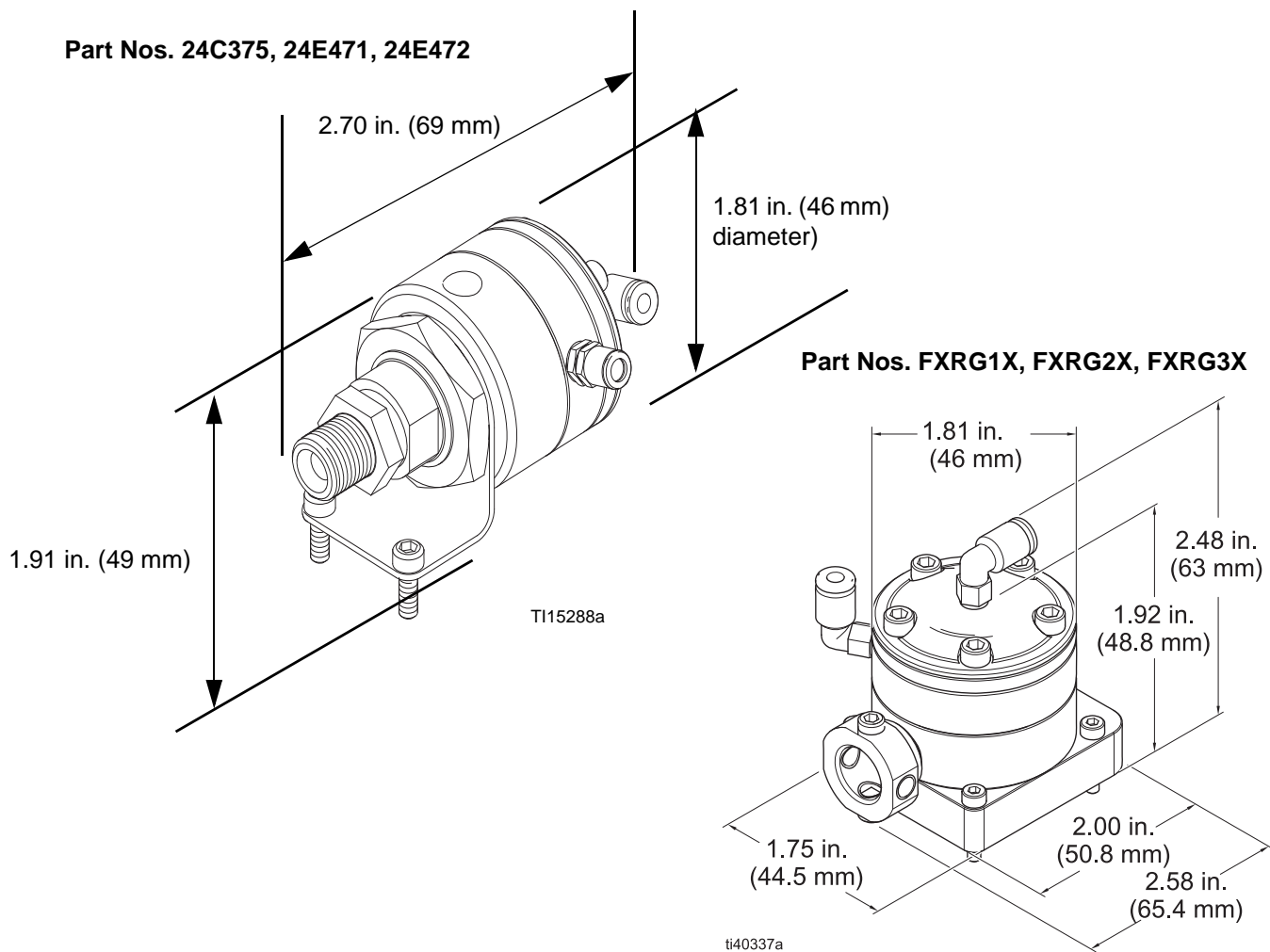


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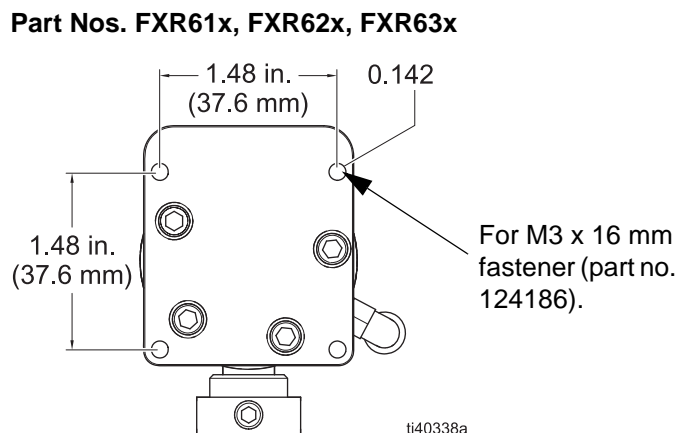
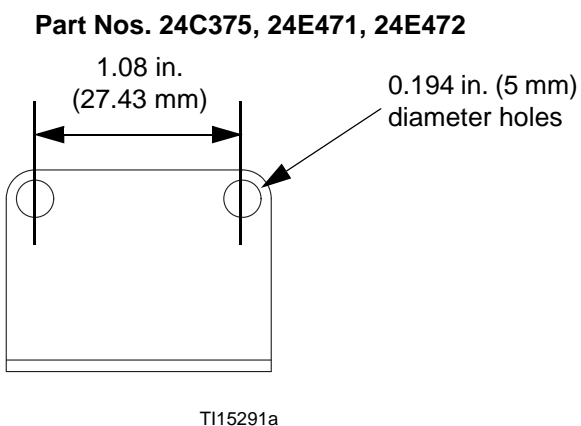


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Dimensions



Bracket Mounting Hole Diagram

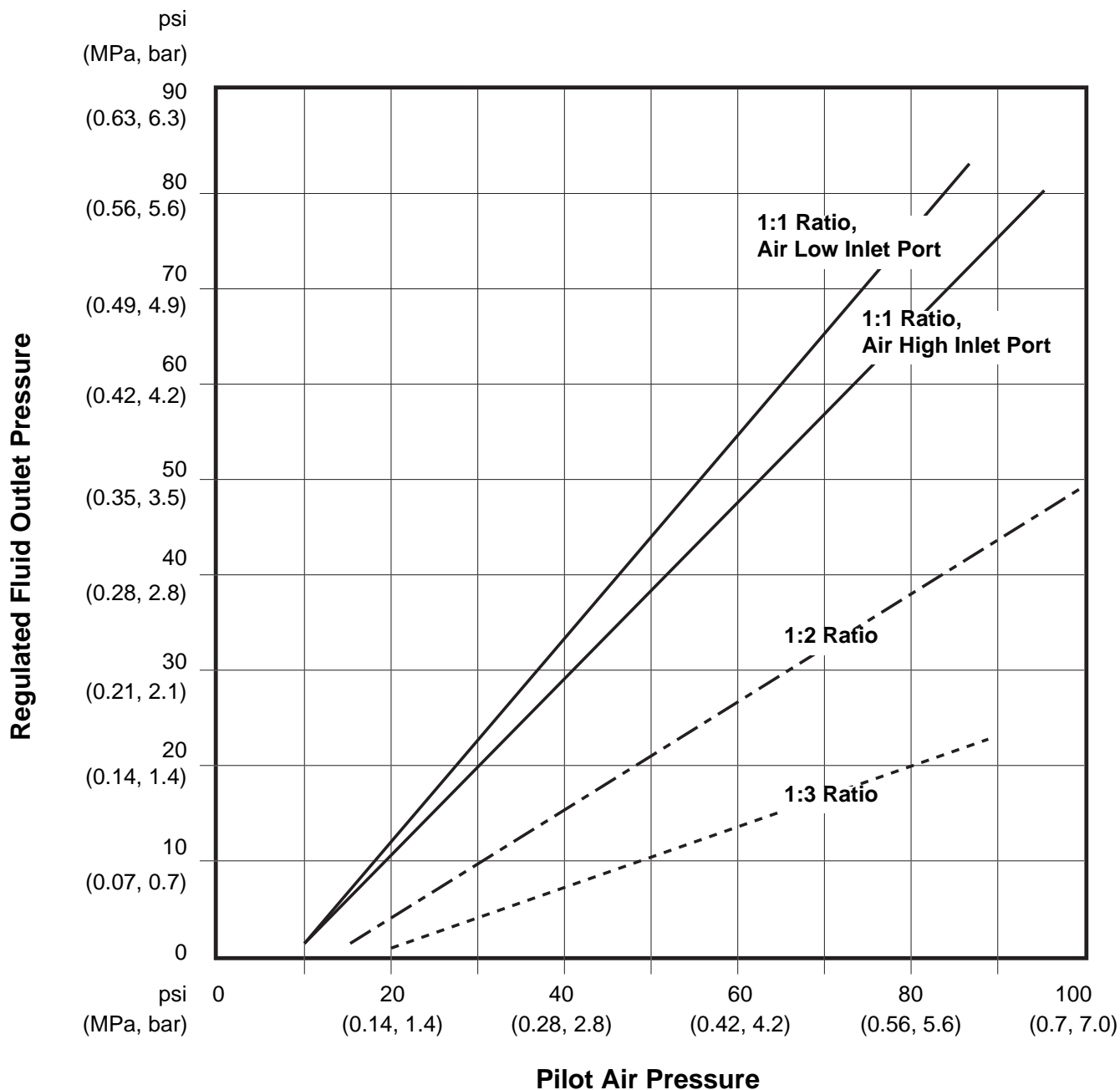


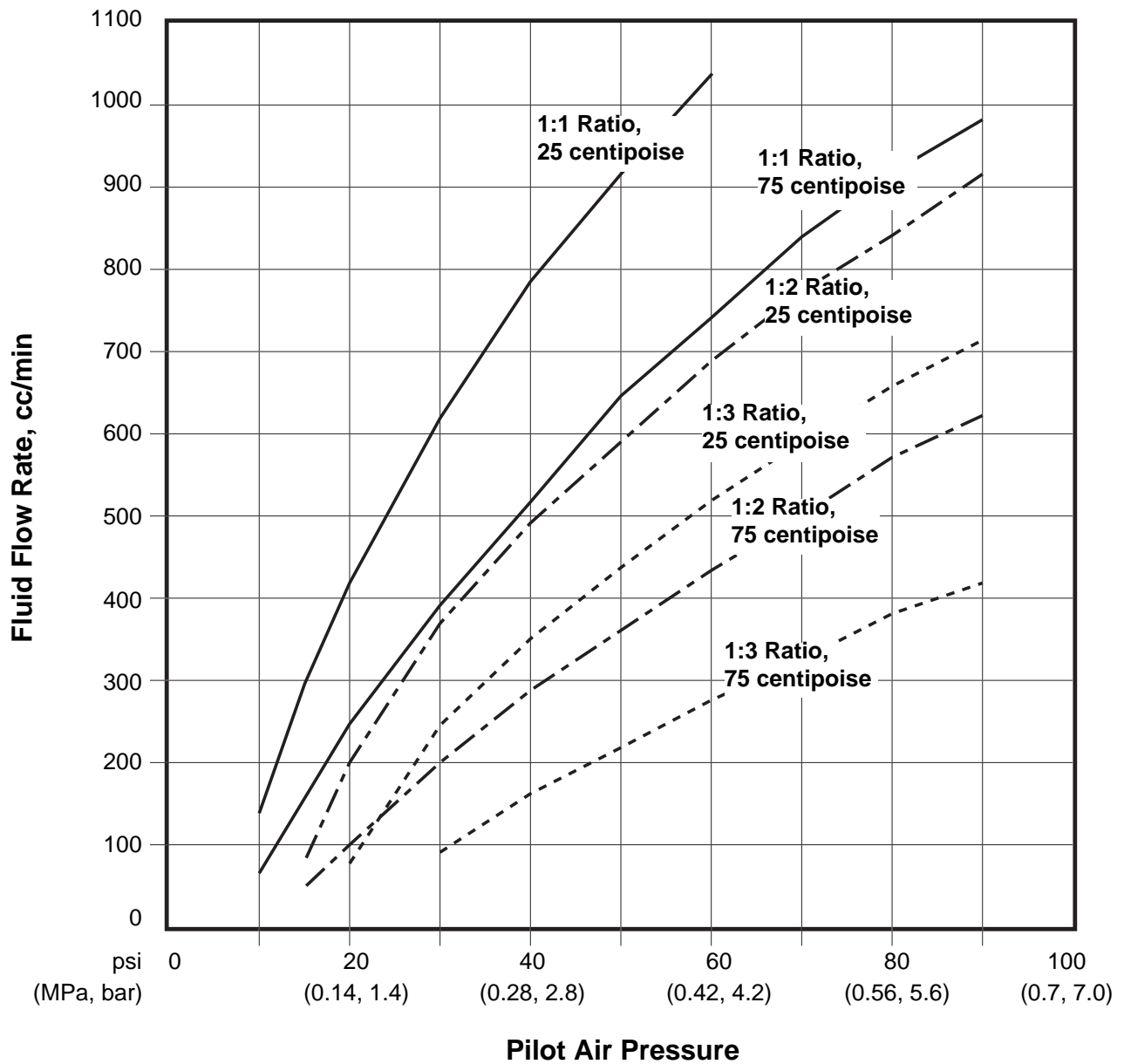
Performance Data

Use the following charts to choose the best ratio for your application, depending on the desired fluid pressure range and pressure losses due to flow rate, fluid viscosity, and fluid line size.

The ratio determines the fluid pressure to air pressure response curve:

- A higher ratio (1:3) will have a flatter response curve and will not react as strongly to changes in the air pilot signal.
- A lower ratio (1:1) will have a steeper response curve but will cover a wider range of fluid pressure.





NOTE: Tested using a 1.0 mm nozzle and 10 ft x 1/4 in. ID (3.05 m x 6 mm) fluid line.

Technical Specifications

Low Flow Fluid Regulator		
	US	Metric
Maximum air inlet pressure	100 psi	0.7 MPa, 7 bar
Maximum fluid inlet pressure	300 psi	2.1 MPa, 21 bar
Maximum regulated fluid pressure (air high inlet port; all models)	90 psi	0.63 MPa, 6.3 bar
Maximum regulated fluid pressure (air low inlet port)		
Models 24C375, FXRG1X, FXRG1T	90 psi	0.63 MPa, 6.3 bar
Models 24E471, FXRG2X, FXRG2T	50 psi	0.35 MPa, 3.5 bar
Models 24E472, FXRG3X, FXRG3T	30 psi	0.21 MPa, 2.1 bar
Ratio		
Models 24C375, FXRG1X, FXRG1T	1:1	
Models 24E471, FXRG2X, FXRG2T	1:2	
Models 24E472, FXRG3X, FXRG3T	1:3	
Maximum fluid operating temperature (Do not exceed the lowest maximum depending on the diaphragm, ball, and seat used in your pump.)		
All models	120 °F	49 °C
Inlet/Outlet Sizes		
Fluid inlet		
Models 24C375, 24E471, 24E472	1/4 npt(m)	
Models FXRG1X, FXRG1T, FXRG2X, FXRG2T, FXRG3X, FXRG3T	IniFlex inlet	
Fluid outlet		
Models 24C375, 24E471, 24E472	1/8 npt(f)	
Models FXRG1X, FXRG1T, FXRG2X, FXRG2T, FXRG3X, FXRG3T	Quick Socket outlet	
Air inlet ports (high and low)	5/32 in. (4 mm) OD tube fitting	
Materials of Construction		
Wetted materials on all models	303 and 17-4 PH grades of stainless steel, ptfe, perfluoroelastomer	
Notes		
All trademarks or registered trademarks are the property of their respective owners.		

California Proposition 65

CALIFORNIA RESIDENTS

 **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

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.

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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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Original instructions. This manual contains English. MM 3A0427

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