Parts

Instructions – Parts List

PrecisionFlo™ XL Metering Modules

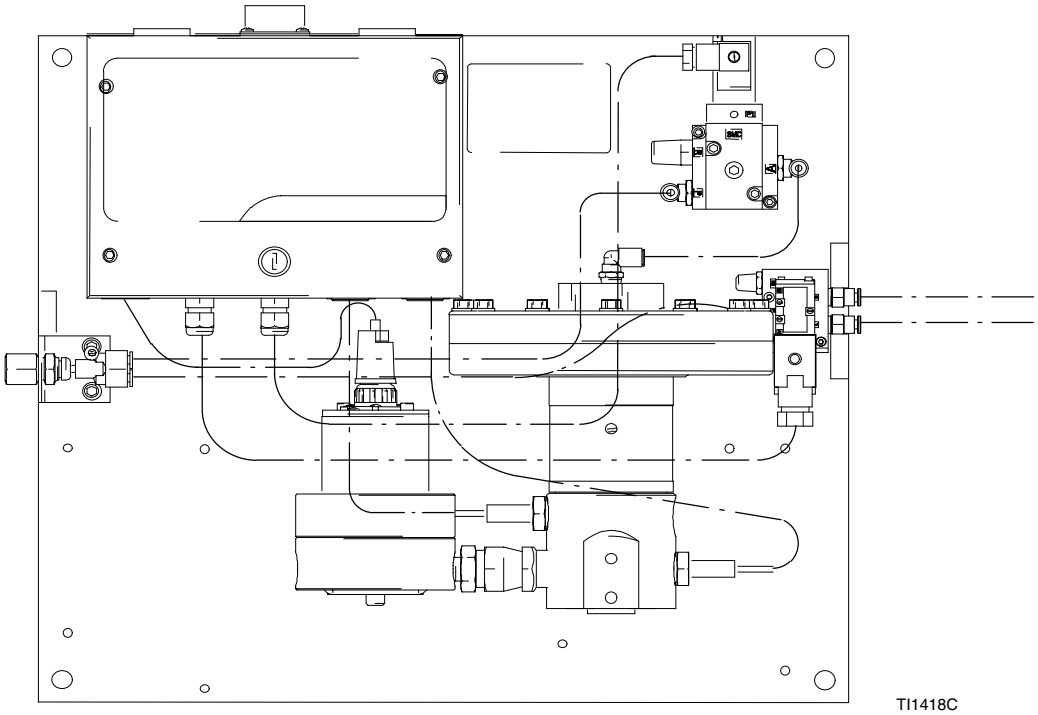
309375 rev.E

5000 psi (345 bar, 34.5 MPa) Maximum Inlet Pressure
3500 psi (240 bar, 24 MPa) Maximum Fluid Working Pressure
120 psi (8.3 bar, 0.83 MPa) Maximum Air Working Pressure

For use when dispensing fluids that meet at least one of the following conditions for non-flammability:

- The fluid has a flash point above 140°F (60°C) and a maximum organic solvent concentration of 20%, by weight, per ASTM Standard D93.
- The fluid does not sustain burning when tested per ASTM Standard D4206 Sustained Burn Test.

Read warnings and instructions.
See page 2 for **Table of Contents** and **List of Models**



TI1418C

PROVEN QUALITY. LEADING TECHNOLOGY.

GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440–1441

Table of Contents

Instruction Manual Conventions

The following table contains the abbreviations that are used in this manual:

Abbreviation:	Stands For:
PVC	Poly Vinyl Chloride
psi	pounds per square inch
V	volts
Vac	volts ac
Vdc	volts dc

Reference numbers (10) and letters (A) in parentheses in this manual's text refer to the numbers and letters in the illustrations.

List of Models

Table 1 — PrecisionFlo Module – Model Numbers

PrecisionFlo XL Module No.	Description
198245	High viscosity precision pneumatic regulator with helical gear flow meter
198246	Low viscosity precision pneumatic regulator with helical gear flow meter
198247	Low viscosity precision pneumatic regulator with spur gear flow meter
198184	Low viscosity precision pneumatic regulator without flow meter
198185	
198187	High viscosity precision pneumatic regulator without flow meter
198188	
233652	Low viscosity precision electric regulator without a flow meter
233653	Low viscosity precision electric regulator with spur gear flow meter
233654	Low viscosity precision electric regulator with helical gear flow meter
233672	High viscosity precision electric regulator without a flow meter
233673	High viscosity precision electric regulator with helical gear flow meter
245315	High viscosity precision electric regulator with helical gear flow meter and an integrated pneumatic mastic regulator
245316	High viscosity precision electric regulator with an integrated pneumatic mastic regulator, without flow meter

Warnings

Warning Symbol

⚠ WARNING

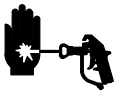
This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

Caution Symbol

⚠ CAUTION

This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.

⚠ WARNING



SKIN INJECTION HAZARD

Spray from the dispensing device, hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed in the eyes or on the skin can also cause serious injury.

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate surgical attention.**
- Do not point the dispensing device at anyone or at any part of the body.
- Do not put hand or fingers over the front of the dispensing device.
- Do not stop or deflect fluid leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** on page 13 whenever you are instructed to: relieve pressure; stop dispensing; clean, check, or service the equipment; or install or clean a spray tip or nozzle.
- Tighten all the fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn, damaged, or loose parts immediately. Permanently coupled hoses cannot be repaired; replace the entire hose.
- ALWAYS wear eye protection and protective clothing when installing, operating, or servicing this dispensing equipment.

TOXIC FLUID HAZARD

Hazardous fluids or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, swallowed, or inhaled.

- Know the specific hazards of the fluid you are using. Read the fluid manufacturer's warnings. Follow the fluid manufacturer's recommendations.
- Provide fresh air ventilation to avoid the buildup of vapors from the fluid being dispensed.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Wear the appropriate protective clothing, gloves, eyewear, and respirator.

⚠ WARNING

INSTRUCTIONS

EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture, malfunction, or start unexpectedly and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, warnings, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are uncertain about usage, call your Graco distributor.
- Only use the PrecisionFlo metering valve with the PrecisionFlo Control Assembly.
- Only use a dispensing device appropriate for the fluid and application method, and capable of operating at the highest possible fluid supply pressure the module may experience.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Check the equipment daily. Repair or replace worn or damaged parts immediately.
- Do not disassemble the PrecisionFlo metering valve motor. The motor contains powerful magnets, which could attract metal objects and create a hazardous condition if the motor end plates are removed. Contact your Graco distributor for motor service.
- Do not exceed the maximum working pressure of the lowest rated system component. The maximum working pressure of the PrecisionFlo metering valve is shown on the fluid head. **Other components may have lower working pressure ratings.**
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 180°F (82°C) or below –40°F (–40°C).
- Do not use the hoses to pull the equipment.
- Use only fluids that are compatible with the equipment wetted parts. See the **Technical Data** sections of all the equipment manuals. Read the fluid manufacturer's warnings.
- Comply with all applicable local, state and national fire, electrical and other safety regulations.
- Do not touch the metal heat sink on the metering valve when the surface is hot.
- Do not cover the PrecisionFlo metering valve; the motor needs air ventilation for cooling.
- Do not attempt to modify the programming of the module. Any modification of the programming could result in serious injury or damage to the module.

MOVING PARTS HAZARD

Moving parts, such as the fluid needle, can pinch fingers.

- Do not operate the equipment with the guard removed.
- Keep clear of any moving parts when starting or operating the equipment.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Improper grounding, poor air ventilation, open flames, or sparks can cause a hazardous condition and result in fire or explosion and serious injury.

- Ground the equipment and the object being sprayed. The PrecisionFlo metering valve is grounded through proper connection of the two electrical cables. See **Ground the Fluid Metering Assembly** on page 11.
- If there is any static sparking or you feel an electric shock while using the equipment, **stop dispensing immediately**. Do not use the equipment until you have identified and corrected the problem.
- Make sure all electrical work is performed by a qualified electrician only.
- Have any checks, installation, or service to electrical equipment performed by a qualified electrician only.
- Make sure all electrical equipment is installed and operated in compliance with applicable codes.
- Do not install the PrecisionFlo module in a hazardous area, as defined in Article 500 of the National Electrical Code (USA).
- Make sure power is disconnected when servicing and repairing equipment.
- Keep the dispensing area free of debris, including solvent, rags, and gasoline.
- Before operating the equipment, extinguish all open flames or pilot lights in the dispense area.
- Do not smoke in the dispensing area.
- Disconnect the two electrical cables from the PrecisionFlo metering valve before servicing the valve.
- Keep liquids away from the electrical components
- Turn off power to the PrecisionFlo module before disconnecting **any** cables connected to the control assembly or fluid metering assembly.
- Disconnect electrical power at the main switch before servicing the equipment.

Fluid Metering Assembly Overview

Pneumatic Fluid Metering Assembly

The fluid metering assembly (Fig. 1) can be attached to a robot arm, or mounted on a pedestal. Main components of the fluid metering assembly are:

- PrecisionFlo XL pneumatic fluid regulator (A)
- flow meter (B) to precisely measure the amount of fluid dispensed (optional)
- solenoid air valve (C) that controls a dispense device
- voltage to pressure (v/p) controller (D) for adjusting the air pressure to the fluid regulator (A)

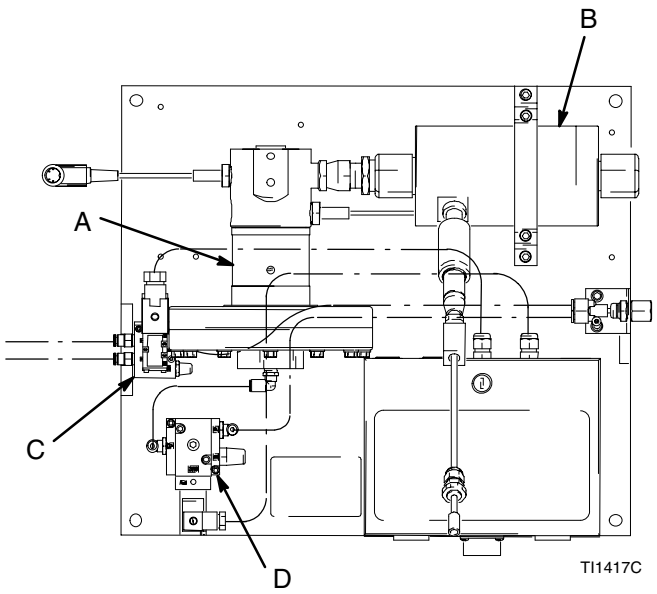


Fig. 1

PrecisionFlo XL Pneumatic Fluid Regulator

The PrecisionFlo XL pneumatic fluid regulator is a precision fluid pressure regulator that uses air pressure to control fluid pressure and to provide fast response to electronic commands and ensure a precisely controlled, continuous flow of material.

The PrecisionFlo XL module combines continuous pressure control with the ability to change bead profiles almost instantaneously. When used with one of the optional flow meters, the PrecisionFlo XL module automatically adjusts for fluctuations in the operating environment, such as material viscosity, temperature, and robot speed, while maintaining the desired dispense rate.

The PrecisionFlo XL metering valve is electrically controlled by the PrecisionFlo XL module and consistent material flow is assured by a closed-loop pressure control design which also adjusts for flow rate. The module responds to robot-supplied signals to provide an accurate and consistent output flow based on a comparison of actual to desired flow rates.

Typical Fluid Applications

- PVC Sealer
- Plastisols
- Sound deadening materials
- Body panel reinforcement

Fluid Metering Assembly Overview

Electric Fluid Metering Assembly

The fluid metering assembly (Fig. 2) can be attached to a robot arm, or mounted on a pedestal. Main components of the fluid metering assembly are:

- PrecisionFlo metering valve (A)
- flow meter (B) to precisely measure the amount of fluid dispensed and close the flow control loop
- solenoid air valve (C) that controls a dispense device
- metering valve closer (D)
- solenoid air valve (E) that controls the metering valve's closer

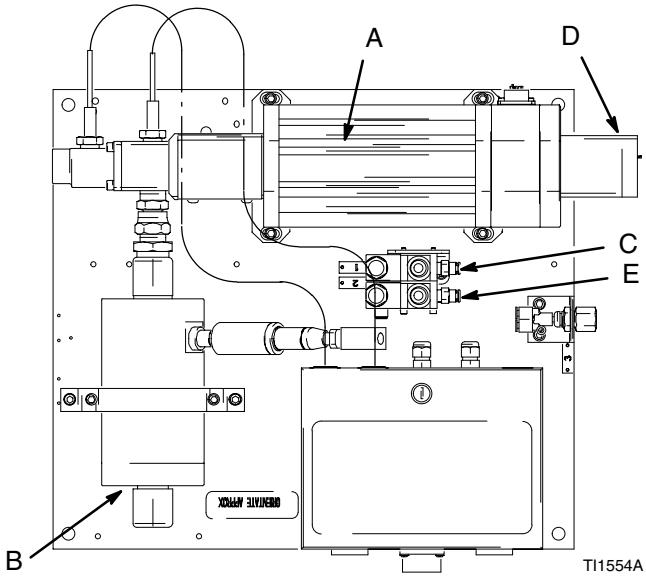


Fig. 2

PrecisionFlo Metering Valve

The PrecisionFlo metering valve (Fig. 3) is a precision fluid pressure regulator that uses a magnetic linear servo motor to regulate material pressure and flow. The needle assembly is directly connected to the linear servo motor, so the needle responds immediately to any motor movement.

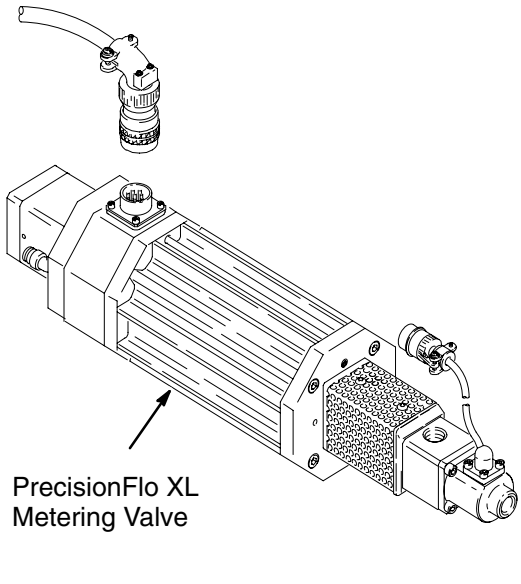


Fig. 3

PrecisionFlo XL Module Overview

The block diagram in Fig. 4 shows an example of the PrecisionFlo XL module.

The fluid metering assembly contains the components that control and monitor fluid dispensing. It can be attached to a robot arm or mounted on a pedestal.

The control assembly sends continuous voltage signals to the PrecisionFlo metering valve to control opening and closing of the metering valve.

The control assembly receives input from the robot controller, user-programmed values, and components on the fluid metering assembly. The control assembly uses this input to determine the signal it should send to the controller.

The PrecisionFlo XL metering valves are electrically controlled by the PrecisionFlo XL module, and consistent material flow is assured by a closed–loop pressure or closed–loop flow control design. The module responds to robot–supplied signals to provide an accurate and consistent output flow based on a comparison of actual to desired flow rates. The electric regulator has a needle directly connected to the motor shaft, yielding nearly instantaneous adjustments to the material flow rate, while the pneumatic regulator uses air pressure to control fluid pressure and to provide fast response to electronic commands and ensure a precisely controlled, continuous flow of material.

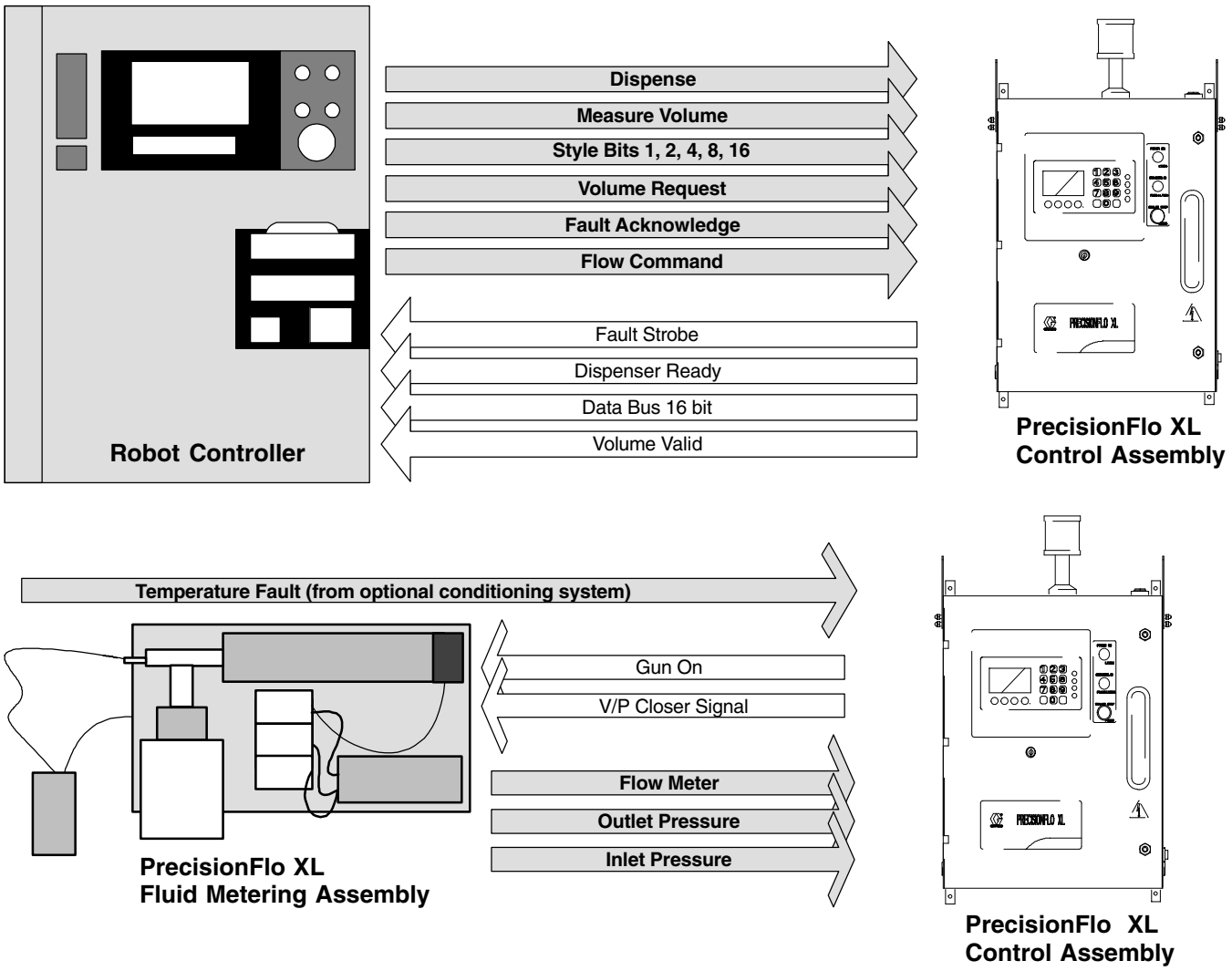


Fig. 4

Installing Fluid Metering Assembly

To install the fluid metering assembly hardware:

- Install the PrecisionFlo fluid metering assembly
- Ground the PrecisionFlo system
- Connect the PrecisionFlo fluid metering assembly to the control assembly
- Connect fluid lines and cables

Installing the Fluid Metering Assembly

⚠ WARNING

ELECTROCUTION HAZARD
Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury. Have only qualified electricians access the fluid metering assembly .

Preparing to Install the Assembly

Before installing the fluid metering assembly:

- See component manuals for specific data on component requirements. Data presented here pertains to the PrecisionFlo fluid metering assembly only.
- Have all system and subassembly documentation available during installation.
- Be sure all accessories are adequately sized and pressure-rated to meet the system's requirements.
- Use only the Graco PrecisionFlo fluid metering assembly with the PrecisionFlo control assembly.

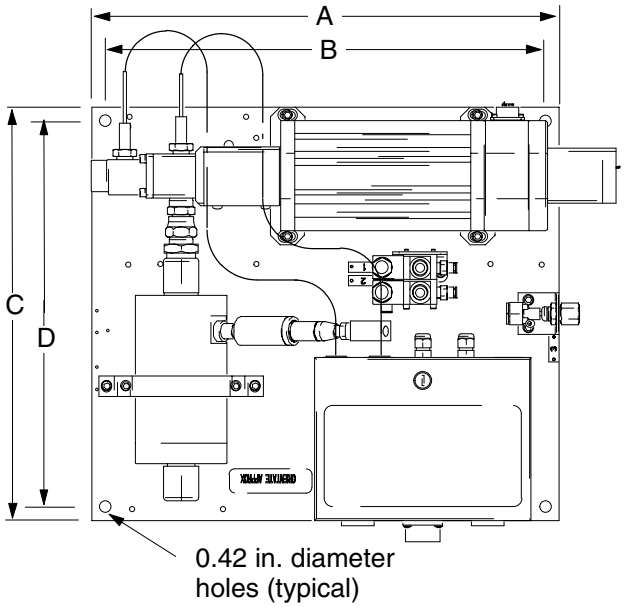
Installing the Assembly

⚠ WARNING

EQUIPMENT MISUSE HAZARD
The fluid metering assembly weighs approximately 60 lbs and should never be moved or lifted by one person. Use adequate personnel and support devices when mounting, moving or handling the control assembly to prevent equipment damage or personal injury.

1. Select a location for the PrecisionFlo fluid metering assembly. Keep the following in mind:
   - Allow sufficient space for installing and using the equipment.
   - Make sure all fluid lines, cables and hoses easily reach the components they will be connected to.
   - Make sure the fluid metering assembly allows the robot to move freely along all axes.
   - Make sure the fluid metering assembly provides easy access for servicing its components.
2. Locate and secure the PrecisionFlo XL fluid metering assembly to the robot (or other mounting surface) with four 3/8 in. bolts through the 0.42 in. diameter holes in the base plate. See the mounting dimensions for the electric regulator system in Fig. 5.

Measurements, inches (mm)	
A	17.0 (432)
B	16.0 (407)
C	15.0 (381)
D	14.0 (356)



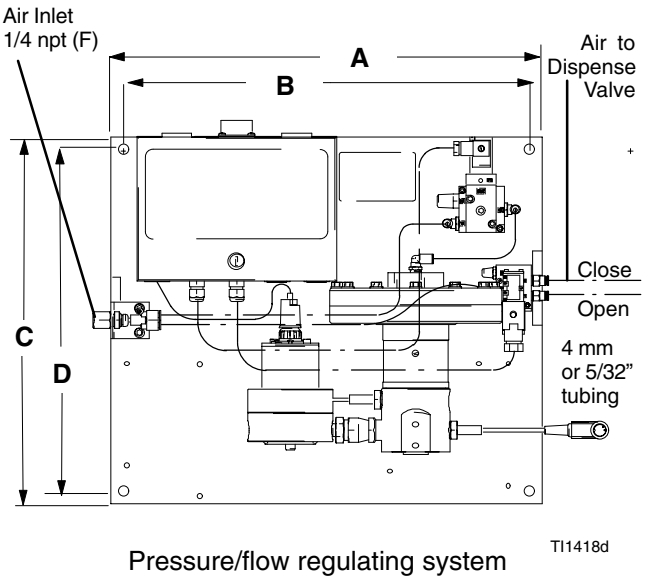
Models 233652, 233653, 233654, 233672, 233673

Fig. 5

Installing Fluid Metering Assembly

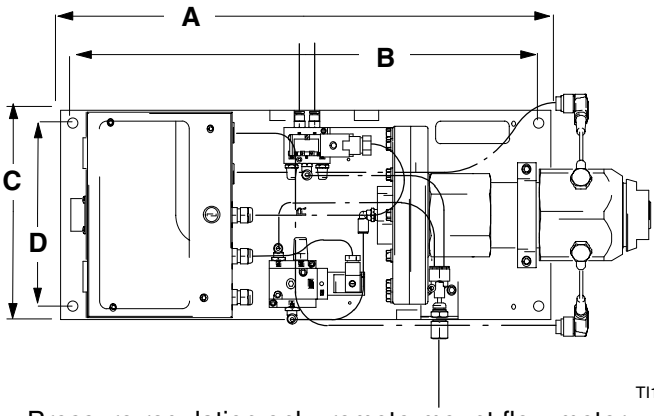
3. See the mounting dimensions for the pressure/flow regulating system in Fig. 6 and for the remote–mount flow meter in Figs. 7 and 8.

Measurements, inches (mm)			
	Fig. 6	Fig. 7	Fig. 8
A	17.0 (432)	20.0 (503)	20.0 (503)
B	16.0 (407)	19.0 (483)	19.0 (483)
C	15.0 (381)	8.0 (204)	8.0 (204)
D	14.0 (356)	7.0 (178)	7.0 (178)



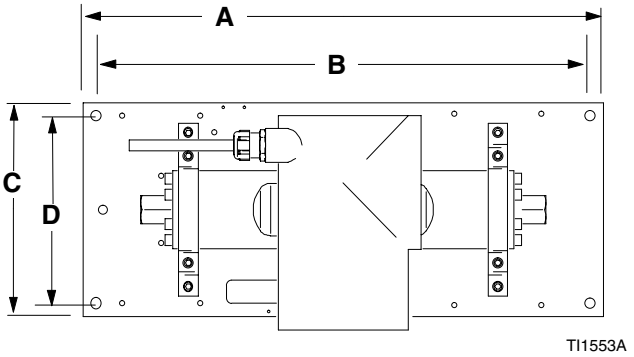
Pressure/flow regulating system
Models 198245, 198246, 198247

Fig. 6



Pressure regulation only, remote-mount flow meter
Models 198184, 198185, 198187, 198188

Fig. 7

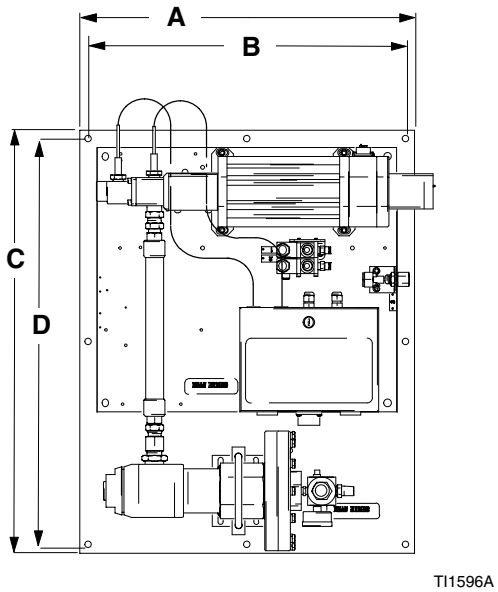


Remote-mount flow meter

Fig. 8

4. See the mounting dimensions for models with a subplate and fluid inlet pressure regulator in Fig. 9.

Measurements, inches (mm)	
A	24.0 (609)
B	23.0 (584)
C	19.0 (483)
D	18.0 (457)



Subplate and fluid inlet pressure regulator
Models 245315, 245316

Fig. 9

Installing Fluid Metering Assembly

Grounding the Fluid Metering Assembly

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

To reduce the risk of fire, explosion, or electric shock:

- The PrecisionFlo fluid metering assembly must be electrically connected to a true earth ground; the ground in the electrical system may not be sufficient.
- All wires used for grounding must be 8 AWG (8.36 mm^2) minimum.
- A qualified electrician must complete all grounding and wiring connections.
- Refer to your local code for the requirements for a “true earth ground” in your area.
- Also read and follow the warnings on pages 3 through 5.

⚠ CAUTION

If power and grounding connections are not done properly, the equipment will be damaged and the warranty will be voided.

Ground the fluid metering assembly as instructed here and in the individual component manuals. Make sure the fluid metering assembly and its components are installed correctly to ensure proper grounding.

Control Assembly

Ground the control assembly as instructed in manual 309374.

Air and Fluid Hoses

For static dissipation, use only electrically conductive hoses or ground the valves.

Metering Module

The PrecisionFlo XL metering valve is grounded to the control assembly through proper connection of the electrical cable provided with the metering module.

Remote Flow Meter Installation

See PrecisionFlo XL instruction manual 309374.

Dispense Device

Follow the grounding instructions in the dispense device documentation.

Connecting Fluid Lines and Cables

After a fluid metering assembly is connected to a control assembly, the units are called a PrecisionFlo module.

1. Install the fluid metering assembly on the robot or in another appropriate place, as instructed on page 9. Ground the system as instructed on page 11.

2. Air must be clean and dry, between 60–120 psi. Flush air line before plumbing in air filter assembly (234967). Plumb in air filter assembly near air drop site (upstream of fluid plate module). Adding an air regulator to this line will provide more consistent dispense valve response times. Connect the air lines to the ports on the fluid metering assembly as shown in Fig. 6.

3. Make the fluid line connections for the fluid metering assembly according to the connection size chart in the Technical Data section of this manual (page 32).

4. Connect the OP cable from the control box to the fluid plate junction box on all models. Connect the motor cable on models with the electric regulator.

⚠ WARNING

When the second outlet port on the 198245, 198187, and 198188. Fluid plate is not used, it must be plugged with the supplied steel plug to prevent high pressure fluid from being emitted from the port. High pressure fluid can cause serious injury.

Troubleshooting

Refer to control manual, 309374, which contains the valid fault codes, possible causes, and solutions for the PrecisionFlo XL module, which includes the fluid metering assembly. Also refer to the section on **Troubleshooting and Fault Recovery** for detailed information on how fault codes are communicated.

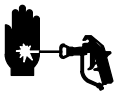
Troubleshooting for individual regulators and flow meters is discussed in their separate manuals. These manuals are called out in the parts lists later in this manual.

Service

Pressure Relief Procedure

This procedure describes how to relieve pressure between the PrecisionFlo metering valve assembly and the automatic dispense valve. See your supply unit or system documentation for instructions on relieving pressure for the entire dispensing system. Use this procedure whenever you shut off the dispense valve and before checking or adjusting any part of the system, to reduce the risk of serious injury.

⚠ WARNING

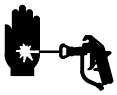


INJECTION HAZARD
The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you:

- are instructed to relieve the pressure
- stop spraying/dispensing
- install or clean the nozzle
- check or service any of the system equipment.

PRESSURIZED FLUID HAZARD
High pressures can cause serious injury**.** Be sure to **open the dispense valve during system heat-up** to alleviate pressure which might occur in the system due to material expansion.

⚠ WARNING



INJECTION HAZARD
The PrecisionFlo XL module pressure must be manually relieved to prevent the module from starting or spraying accidentally. To reduce the risk of an injury including fluid injection, splashing in the eyes or on the skin, or injury from moving parts, always follow the **Pressure Relief Procedure** whenever you:

- are instructed to relieve the pressure
- check or service any of the system equipment
- shut off the pump or install or clean the spray tip.

1. Shut off the fluid supply to the metering valve.
2. Shut off power and air to the fluid supply systems
3. Place a waste container beneath the fluid drain valve, which is located at the filter. Place a waste container beneath the dispense device.
4. Slowly open the drain valves located at each filter, to relieve pressure.
5. Leave the drain valves open until you are ready to pressurize the system again.
6. In Manual Dispense Mode, touch and hold the **Dispense Gun** button. This will actuate the metering valve and the dispensing device and relieve fluid pressure.
7. Refer to Fig. 10 and perform the following steps to open the dispense device and relieve fluid pressure:

   a. To relieve fluid pressure, manually actuate the plunger on the solenoid (C) that opens the dispense device.

   b. Continue actuating the plunger until all pressure is purged from the system between the needle and the dispense device before proceeding.

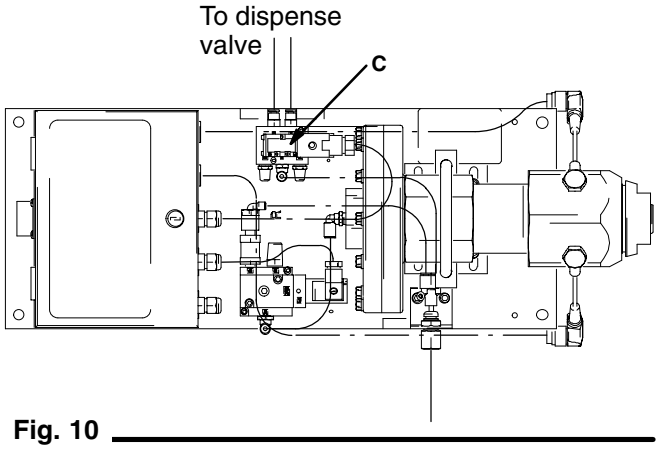


Fig. 10

NOTE: If, after following the steps above, you suspect that a valve, hose, or the mixer dispenser nozzle has become completely clogged, or that pressure has not been fully relieved, VERY SLOWLY loosen the mixer shroud or hose end coupling and gradually relieve the pressure. Then loosen completely and clear the tip, valve, or hose. DO NOT attempt to pressurize the system until the blockage is cleared.

Service

This section describes how to remove and replace these components on the fluid metering assembly:

- flow meter (20) (Fig. 11)
- metering valve (14) (Fig. 13)

NOTE: The numbers in parentheses in the text refer to reference numbers in the parts drawings and parts lists.

Prepare the System for Service

1. Shut off the material supply.
2. Shut off the system air.
3. **Relieve the system pressure**.

⚠ WARNING

To reduce the risk of serious injury, whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 13.

Servicing the Flow Meter

There are no serviceable parts in the flow meter (20). To correct a problem with the flow meter, refer to the maintenance and troubleshooting sections of the Flow Meter Manual, 308968.

Remove the Flow Meter from the Mounting Plate

1. Prepare the system for service as instructed above.
2. Disconnect the flow meter cable (J) from the flow meter sensor. See Fig. 11.
3. Disconnect the material hose (K).
4. Disconnect the swivel fitting (18) from the regulator.
5. Loosen the two screws (12), and remove the curved bracket (22).
6. The flow meter (20) weighs approximately 15 lbs. (6.75 kg). Carefully lift it off the mounting plate (10).

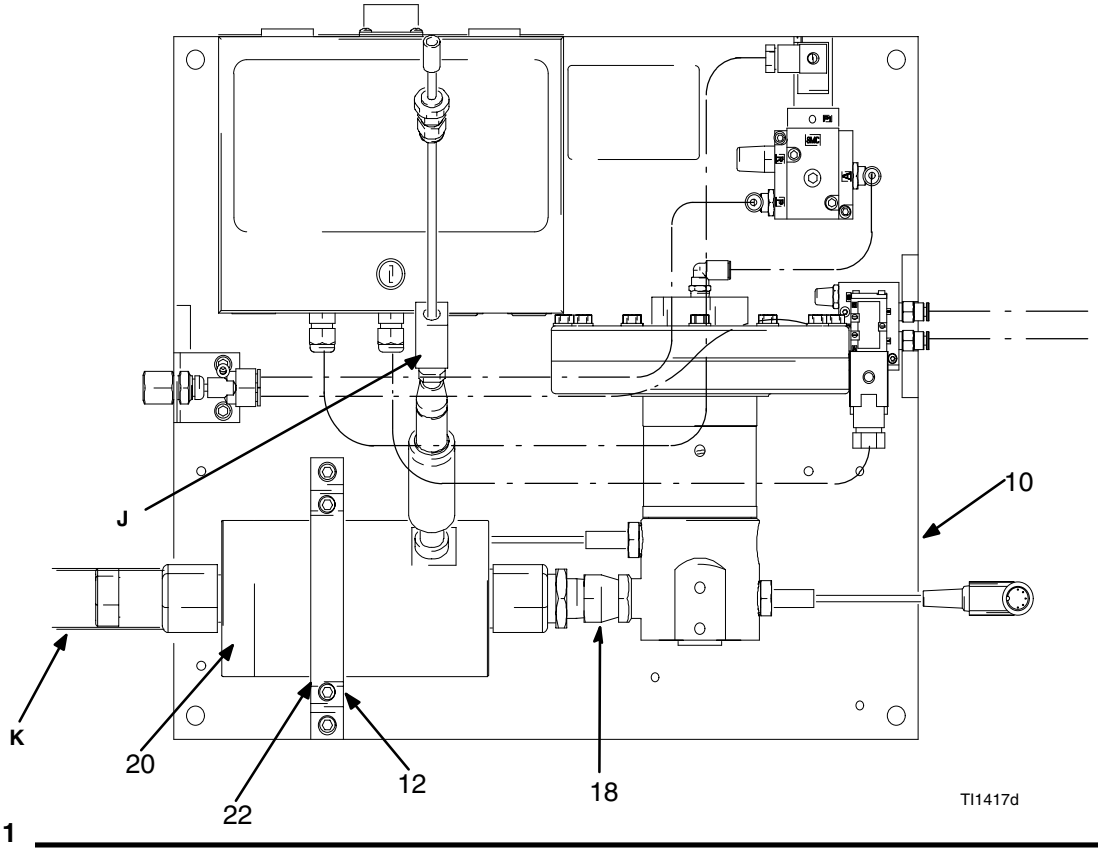


Fig. 11

Service

Install the Flow Meter on the Mounting Plate

1. Rest the flow meter (20) on the flow meter bracket (23) while threading the swivel fitting (18) onto the metering valve material inlet. See Fig. 11 and 12.

2. Tighten the swivel fitting (18) to the metering valve material inlet.

3. Place the curved bracket (22) over the flow meter, then tighten the two screws (12) to hold the bracket and flow meter in place.

4. Check that the flow meter (20) and regulator (14) are still aligned.

5. Connect the material hose (K).

6. Connect the flow meter cable (J).

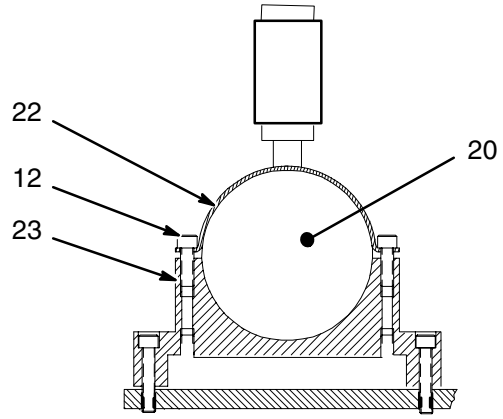


Fig. 12

Servicing the Metering Valve

Remove the metering valve (14) from the mounting plate (10) and replace it with a new unit. For information about servicing the metering valve or the metering valve's sensor, see the metering valve manual, 309382.

Remove the Metering Valve from the Mounting Plate

1. Prepare the system for service as instructed on page 13.

2. Disconnect the motor power cable from the metering valve connector (L). See Fig. 13.

3. Disconnect the pressure sensor cables from the junction box connectors (N).

4. Disconnect the closer air line from the closer air inlet (M).

5. Disconnect the material line from the metering valve material outlet (O).

6. Disconnect the swivel fitting (18) from the metering valve.

7. Remove the screws (16), from the rear metering valve bracket (15).

8. Remove the screws (16), from the front metering valve bracket (11).

9. The metering valve (14) weighs approximately 18 lbs. (8.16 kg). Carefully lift it off the mounting plate (10).

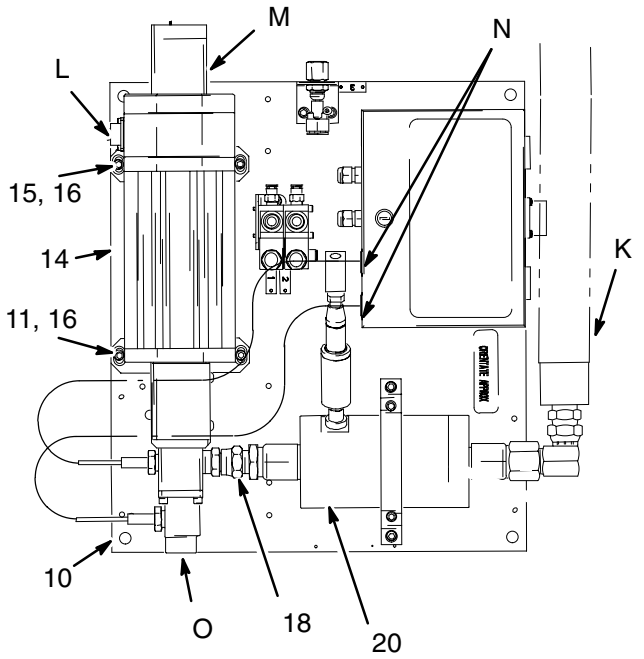


Fig. 13

Servicing the Metering Valve (con't)

Install the Metering Valve on the Mounting Plate

1. Place the metering valve (14) on the mounting plate (10). Secure it with the rear and front metering valve brackets (15 and 11), screws (16). See Fig. 14.
2. Check that the flow meter (20) and metering valve (14) are aligned.
3. Tighten the swivel fitting (18) onto the metering valve material inlet. See Fig. 14.
4. Connect the material line to the metering valve material outlet (O).
5. Connect the motor power cable to the metering valve connector (L).
6. Connect the pressure sensor cables to the junction box connectors (N).
7. Connect the closer air line to the closer air inlet (M).

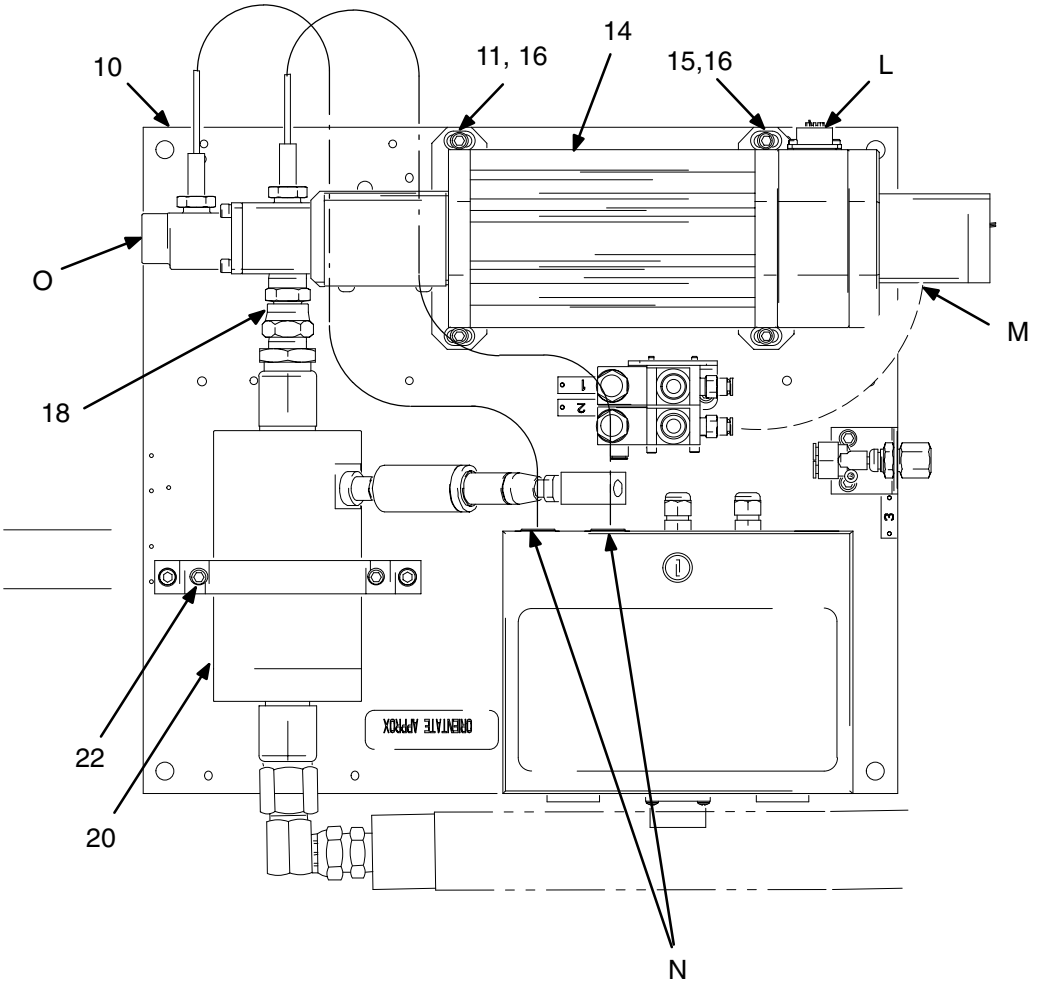


Fig. 14

Service

NOTE: For complete fluid regulator service refer to instruction manual 308647. For Mastic Fluid Regulators (part no. 244740) refer to instruction manual 307517.

Replacing the Cartridge

See Fig. 15 and perform the following steps.

> **⚠ CAUTION**
>
> Handle the hard carbide parts ball , valve actuator , and valve seat , carefully to avoid damaging them.

1. **Relieve the pressure.**

> **⚠ WARNING**
>
> To reduce the risk of serious injury, whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 13.

2. Remove the cartridge assembly by loosening the valve housing (5) with a 6mm hex wrench and pulling the cartridge assembly out of the base housing (4).

   NOTE: The retaining nut (3) often loosens when removing the cartridge assembly from the base housing. Be sure to re–torque as described in step 4.

3. Inspect and clean the internal walls of the base housing (4).

   NOTE: Be careful that you do not scrape or gouge the internal walls of the base housing. They are a sealing surface.

4. Re-torque the retaining nut (3) to 140 to 160 in-lb (16 to 18 N-m).

   NOTE: You must re-torque the retaining nut **before** you install it in the base housing in step 5.

5. Install the new cartridge assembly in the base housing (4), and torque the valve housing (5) to 30 to 35 ft-lb (41 to 48 N-m).

   NOTE: The valve seat is double sided and may be reversed for extended life. The o-ring and ball must be replaced. See instruction manual 308647

Service Kits for Regulator 244734

For the Fluid Diaphragm Repair Kit, order Part No. 238747.

For the Cartridge Repair Kit, order Part No. 238748.

To convert from a spring-operated to an air-operated regulator, order the Air-Operated Conversion Kit, Part No. 238749.

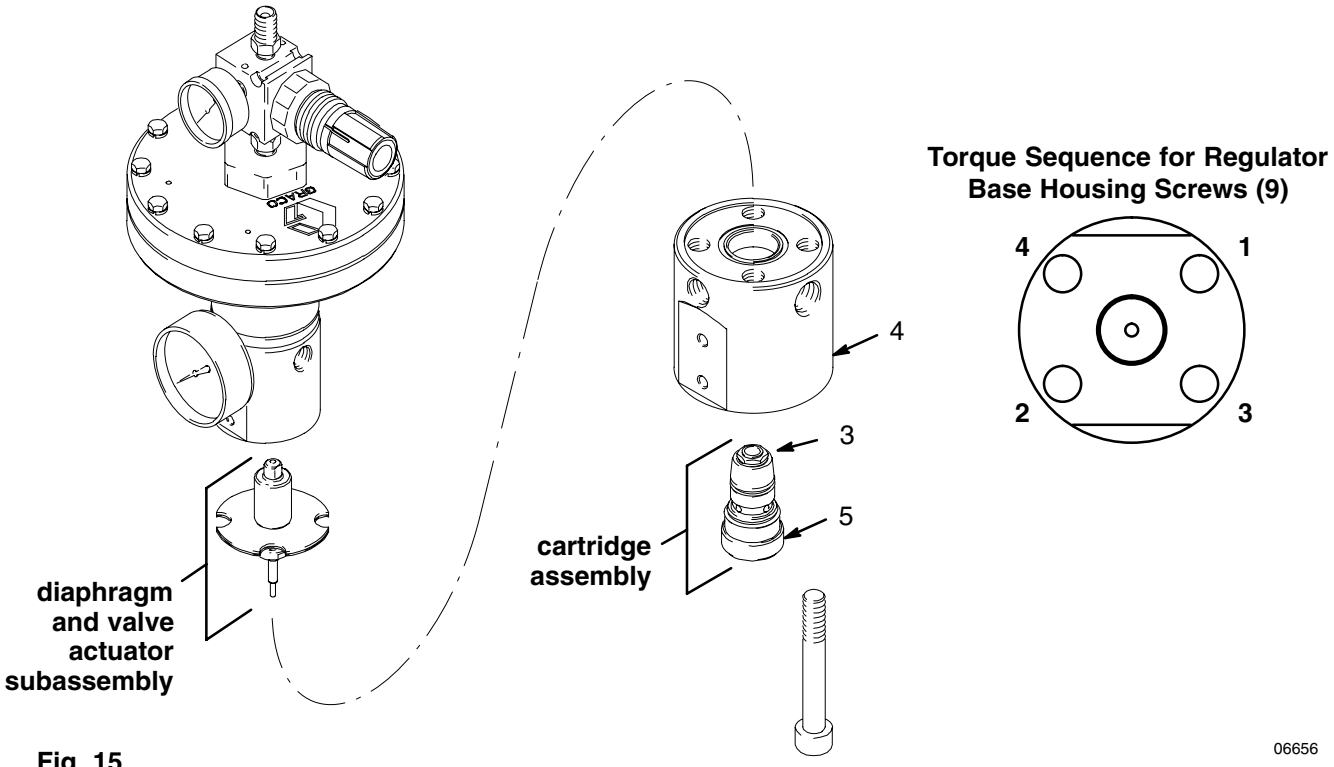
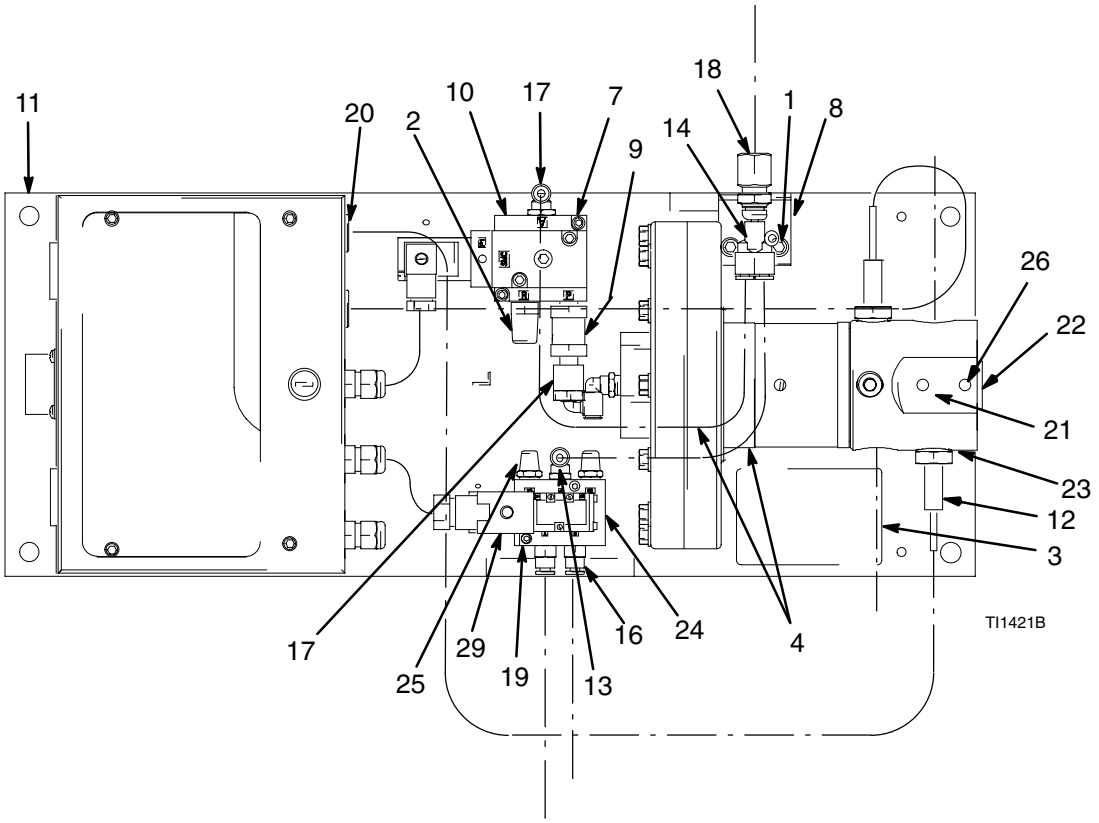


Fig. 15

06656

Parts

PrecisionFlo XL Modules (Part Nos. 198184 and 198185)

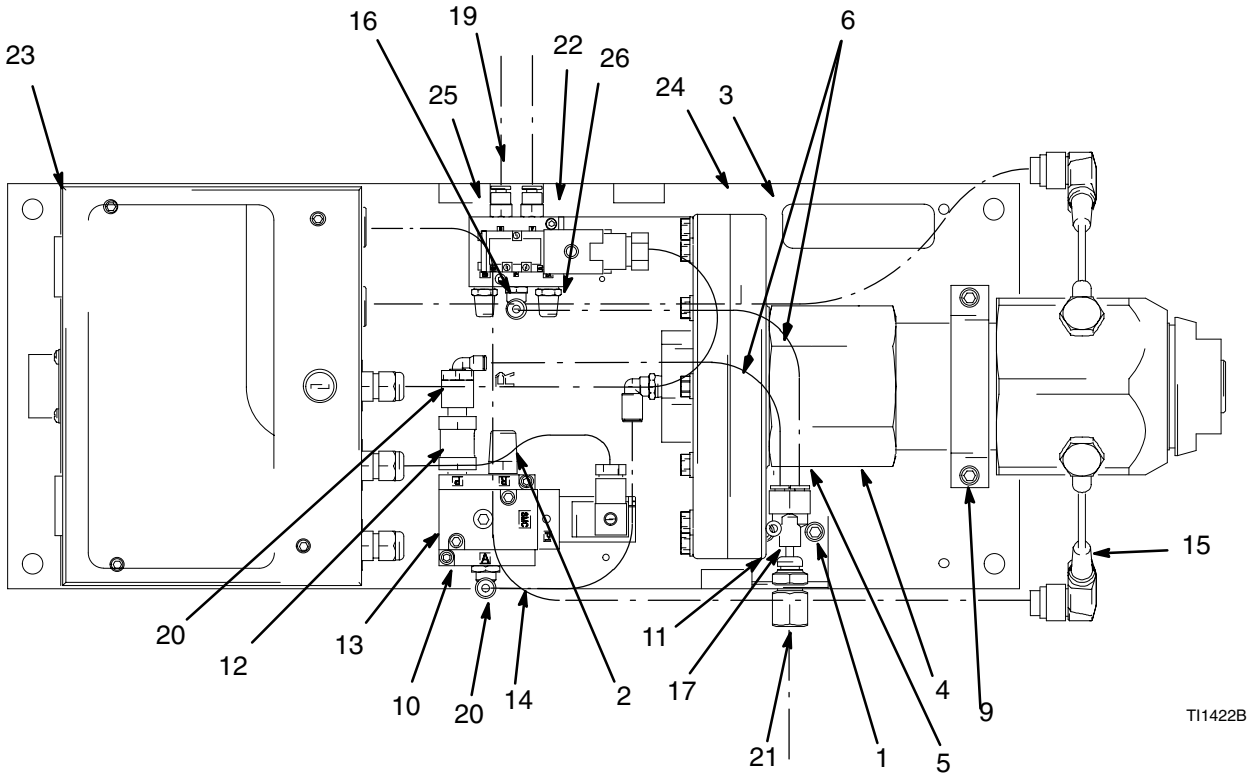


Ref. No.	Part No.	Description	Qty.
1	107530	SCREW, cap, sch, hex	6
2	517449	MUFFLER, sintered, 1/4 npt	1
3	552069	LABEL, metalized	1
4	054753	TUBE, nylon, rd, black	1.6
7	112671	SCREW, cap, sch	2
8	115713	BRACKET, tube	1
9	234967	MUFFLER, inline filter (not shown)	1
10	195942	REGULATOR, I/P	1
11	197829	PLATE, fluid, SD	1
12	198082	SENSOR, pressure	2
13	198171	FITTING, elbow	1
14	198175	FITTING, push	1

Ref. No.	Part No.	Description	Qty.
16	198177	FITTING, push, straight	2
17	198178	FITTING, elbow	2
18	198179	FITTING, bulkhead, union	1
19	198182	SCREW, cap, sch	2
20	198183	BOX, junction	1
21	198226	SCREW, cap, sch	1
22	198231	BRACKET, regulator	1
23	244734	REGULATOR, assembly, XL (see manual 308647)	1
24	551348	VALVE, sol. 4-way 24 Vdc 1/8 npt	1
25	C06061	MUFFLER, sintered, dia 1/8	2
26	C19800	SCREW, cap, sch	2
29	196108	PLUG, din	1

Parts

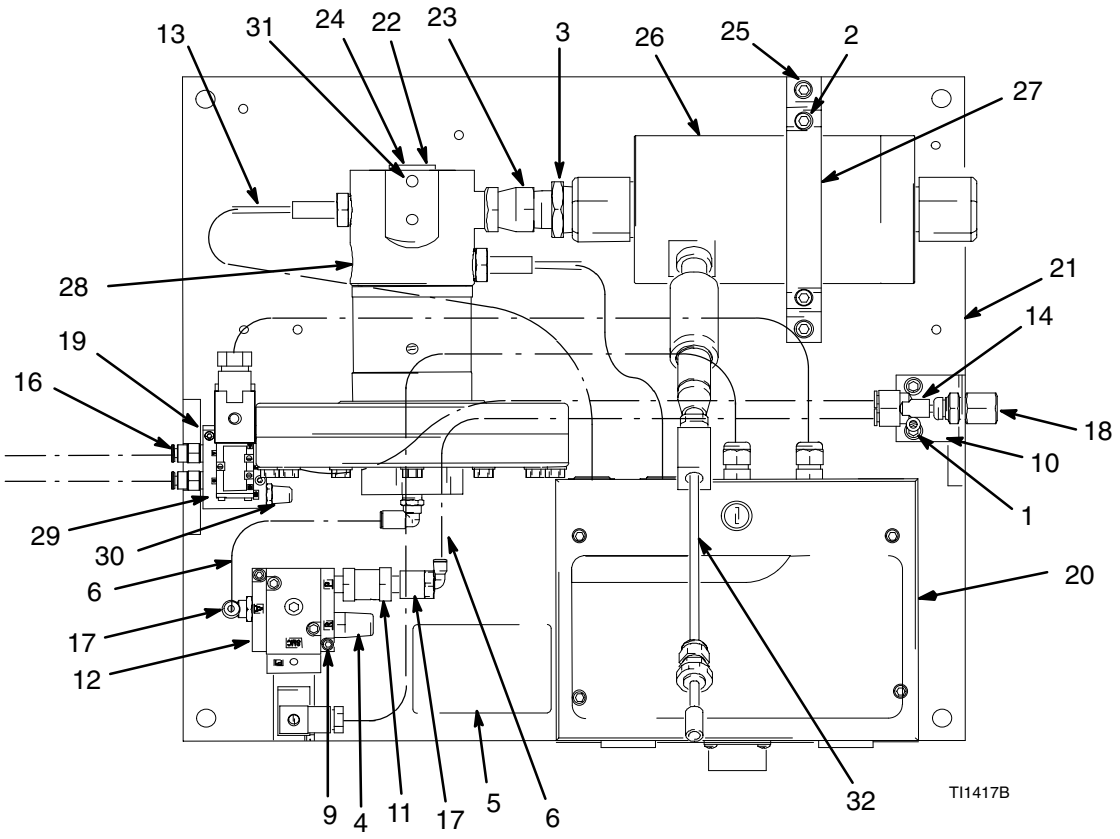
PrecisionFlo XL Fluid Plate, High Flow (Part No. 198187 and 198188)



Ref. No.	Part No.	Description	Qty.
1	107530	SCREW, cap, sch	8
2	517449	MUFFLER, sintered, 1/4 npt	1
3	552069	LABEL, metalized	1
4	198268	BOLT, U	1
5	198269	BRACKET, regulator	1
6	054753	TUBE, nylon, rd, black	1.6
9	108328	SCREW, cap, sch	2
10	112671	SCREW, cap, sch	2
11	115713	BRACKET, tube	1
12	234967	MUFFLER, inline filter (not shown)	1
13	195942	REGULATOR, I/P	1
14	197829	PLATE, fluid, SD	1
15	198082	SENSOR, pressure	2
16	198171	FITTING, elbow	1
17	198175	FITTING, push	1
19	198177	FITTING, push, straight	2
20	198178	FITTING, elbow	2
21	198179	FITTING, bulkhead, union	1
22	198182	SCREW, cap, sch	2
23	198183	BOX, junction	1
24	244740	REGULATOR, mastic, 500 psi (see manual 307517)	1
25	551348	VALVE, sol. 4-way 24 Vdc 1/8 npt	1
26	C06061	MUFFLER, sintered, dia 1/8	2

Parts

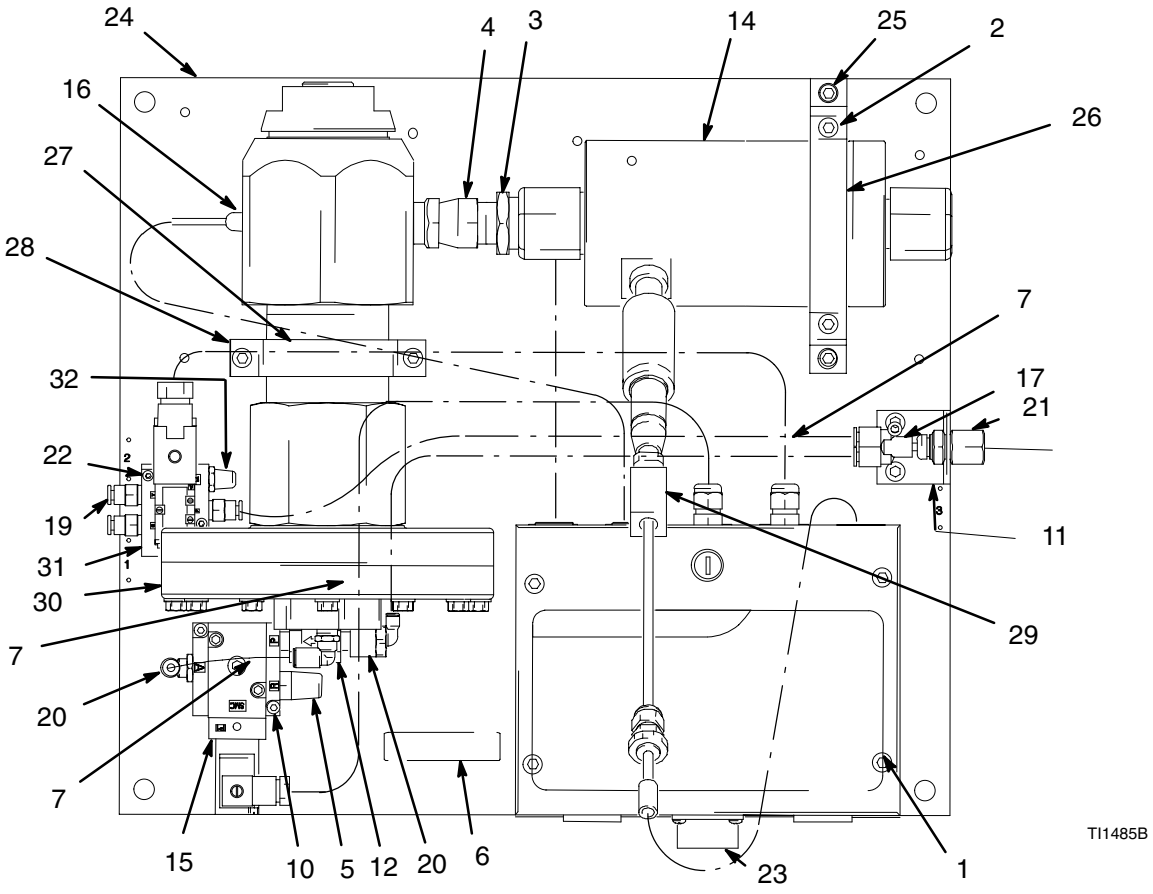
PrecisionFlo XL Fluid Plate, Low Flow, RS (Part No. 198246)



Ref. No.	Part No.	Description	Qty.
1	107530	SCREW, cap, sch	8
2	110580	SCREW, cap, sch	2
3	157191	FITTING, adapter	1
4	517449	MUFFLER, sintered, 1/4 npt	1
5	552069	LABEL, metalized	1
6	054753	TUBE, nylon, rd, black	2.4
9	112671	SCREW, cap, sch	2
10	115713	BRACKET, tube	1
11	234967	MUFFLER, inline filter (not shown)	1
12	195942	REGULATOR, I/P	1
13	198082	SENSOR, pressure	2
14	198175	FITTING. push	1
16	198177	FITTING, push, straight	3
17	198178	FITTING, elbow	2
18	198179	FITTING, bulkhead, union	1
19	198182	SCREW, cap, sch	2
20	198183	BOX, junction	1
21	198186	PLATE, fluid, RS	1
22	198226	SCREW, cap, sch	1
23	198230	FITTING, swivel	1
24	198231	BRACKET, regulator	1
25	198242	BRACKET, flow meter	1
26	617418	METER, flow (see manual 308968)	1
27	198244	BRACKET, mounting	1
28	244734	REGULATOR, assembly, XL (see manual 308647)	1
29	551348	VALVE, sol. 4-way 24 Vdc 1/8 npt	1
30	C06061	MUFFLER, sintered, dia 1/8	2
31	C19800	SCREW, cap, socket head	2
32	198579	HARNESS, cable, with connector SRZ 40	2

Parts

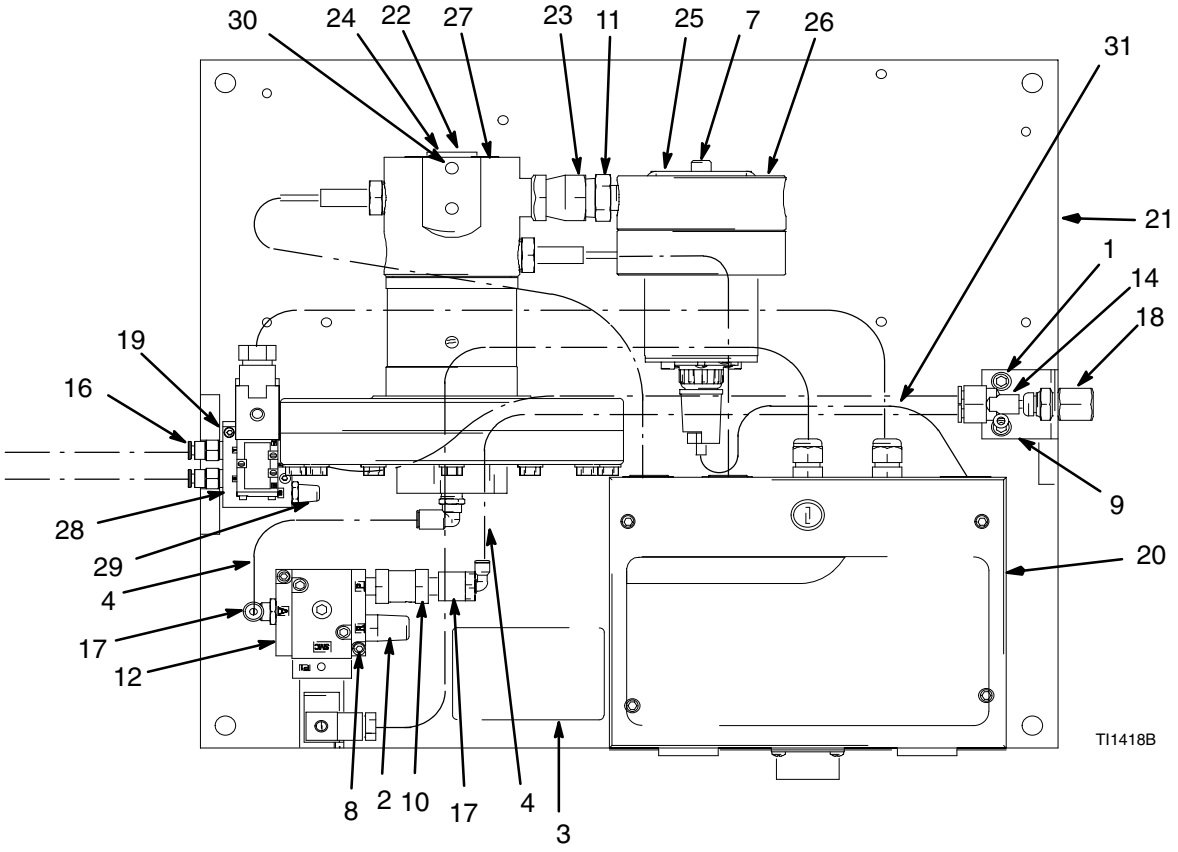
PrecisionFlo XL Fluid Plate, High Flow, RS (Part No. 198245)



Ref. No.	Part No.	Description	Qty.
1	107530	SCREW, cap, sch	8
2	110580	SCREW, cap, sch	6
3	C20488	FITTING, nipple	1
4	157785	SWIVEL, union	1
5	517449	MUFFLER, sintered, 1/4 npt	1
6	552069	LABEL, metalized	1
7	054753	TUBE, nylon, rd, black	2.4
10	112671	SCREW, cap, sch	2
11	115713	BRACKET, tube	1
12	234967	MUFFLER, inline filter (not shown)	1
14	617418	METER, fluid flow with fittings (see manual 308968)	1
15	195942	REGULATOR, I/P	1
16	198082	SENSOR, pressure	2
17	198175	FITTING, push	1
19	198177	FITTING, push, straight	3
20	198178	FITTING, elbow	2
21	198179	FITTING, bulkhead, union	1
22	198182	SCREW, cap, sch	2
23	198183	BOX, junction	1
24	198186	PLATE, fluid, RS	1
25	198242	BRACKET, flow meter	1
26	198244	BRACKET, mounting	1
27	198268	BRACKET, regulator	1
28	198269	BRACKET, regulator, lower	1
29	198579	HARNESS,cable, with connector SRZ 40	1
30	244740	REGULATOR, mastic, 5000 psi (see manual 307517)	1
31	551348	VALVE, sol 4-way 24 Vdc 1/8 npt	1
32	244740	MUFFLER, sintered, dia 1/8	2

Parts

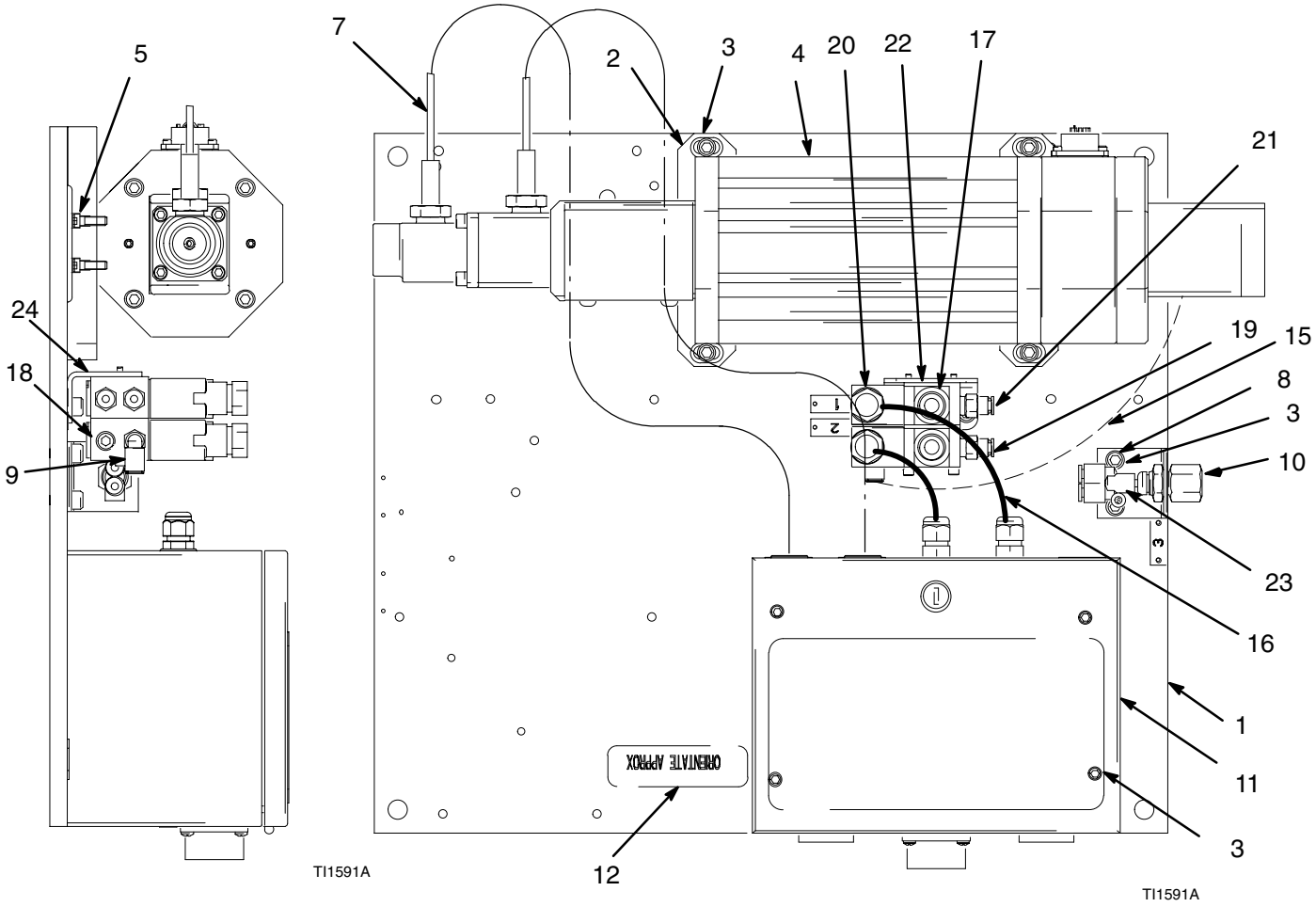
PrecisionFlo XL Fluid Plate, Low Flow, RS, G3000 (Part No. 198247)



Ref. No.	Part No.	Description	Qty.
1	107530	SCREW, cap, sch, hex	6
2	517449	MUFFLER, sintered, 1/4 npt	4
3	552069	LABEL, metalized FITTING, adapter	1
4	054753	TUBE, nylon, rd, black	2.4
7	110501	SCREW, cap, sch	2
8	112671	SCREW, cap, sch	2
9	115713	BRACKET, tube	1
10	234967	MUFFLER, inline filter (not shown)	1
11	162449	FITTING, nipple, reducing	1
12	195942	REGULATOR, I/P	1
13	198082	SENSOR, pressure	2
14	198175	FITTING, push,	1
16	198177	FITTING, push,	3
17	198178	FITTING, elbow	2
18	198179	FITTING, bulkhead, union	1
19	198182	SCREW, cap, sch	2
20	198183	BOX, junction	1
21	198186	PLATE, fluid, RS	1
22	198226	SCREW, cap, sch	1
23	156684	FITTING, swivel	1
24	198231	BRACKET, regulator	1
25	198327	BRACKET, flow meter	1
26	239716	GEAR, meter assembly, G3000 (see manual 308778)	1
27	244734	REGULATOR, assembly, XL (see manual 308647)	1
28	551348	VALVE, sol. 4-way 24 Vdc 1/8 npt	1
29	C06061	MUFFLER, sintered, dia 1/8	1
30	C19800	SCREW, cap, socket head	2
31	198578	HARNESS, cable, with connector G3000.	1

Parts

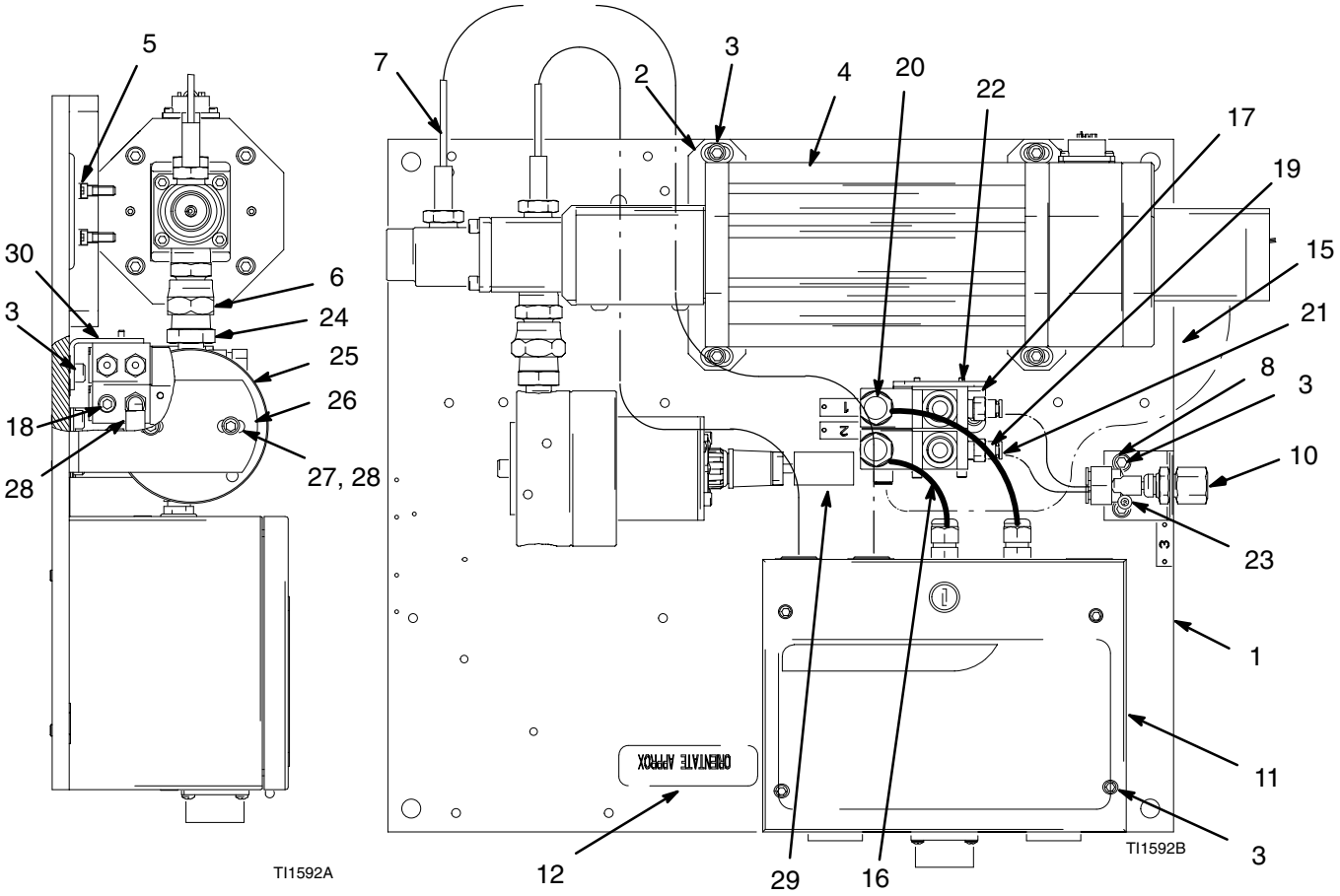
PrecisionFlo XL Fluid Plate, Low Viscosity, Electric Regulator, no Flow Meter (Part No. 233652)



Ref. No.	Part No.	Description	Qty.
1	198186	PLATE, fluid, RS	1
2	198317	BRACKET, mnt, valve, metering	2
3	107530	SCREW, cap, sch, hex	12
4	244920	VALVE, assy, metering, low flow (see manual 309382)	1
5	111788	SCREW, cap, sch	4
7	198082	SENSOR, pressure	2
8	115713	BRACKET, tube	1
9	198171	FITTING, elbow	1
10	198179	FITTING, bulkhead, union	1
11	198183	BOX, junction	1
12	198315	BLANK, label, kit	1
15	054753	TUBE, nylon, rd, black	1
16	198683	WIRE, 3 cond, 22 gauge	1
17	198446	VALVE, dispense, closer	2
18	C19252	PIPE, 1/8 c'snk pipe, PL 5017–50	1
19	C06061	MUFFLER, sintered, dia 1/8	2
20	196108	PLUG, assy, 100v light, numatics	2
21	198177	FITTING, push, straight	4
22	198351	SCREW, cap, M3X.5 X 50	2
23	198175	FITTING, push	1
24	198808	BRACKET, solenoid, plate, fluid, elec	1

Parts

PrecisionFlo XL Fluid Plate, Low Viscosity, Electric Regulator, Spur Gear Meter (Part No. 233653)

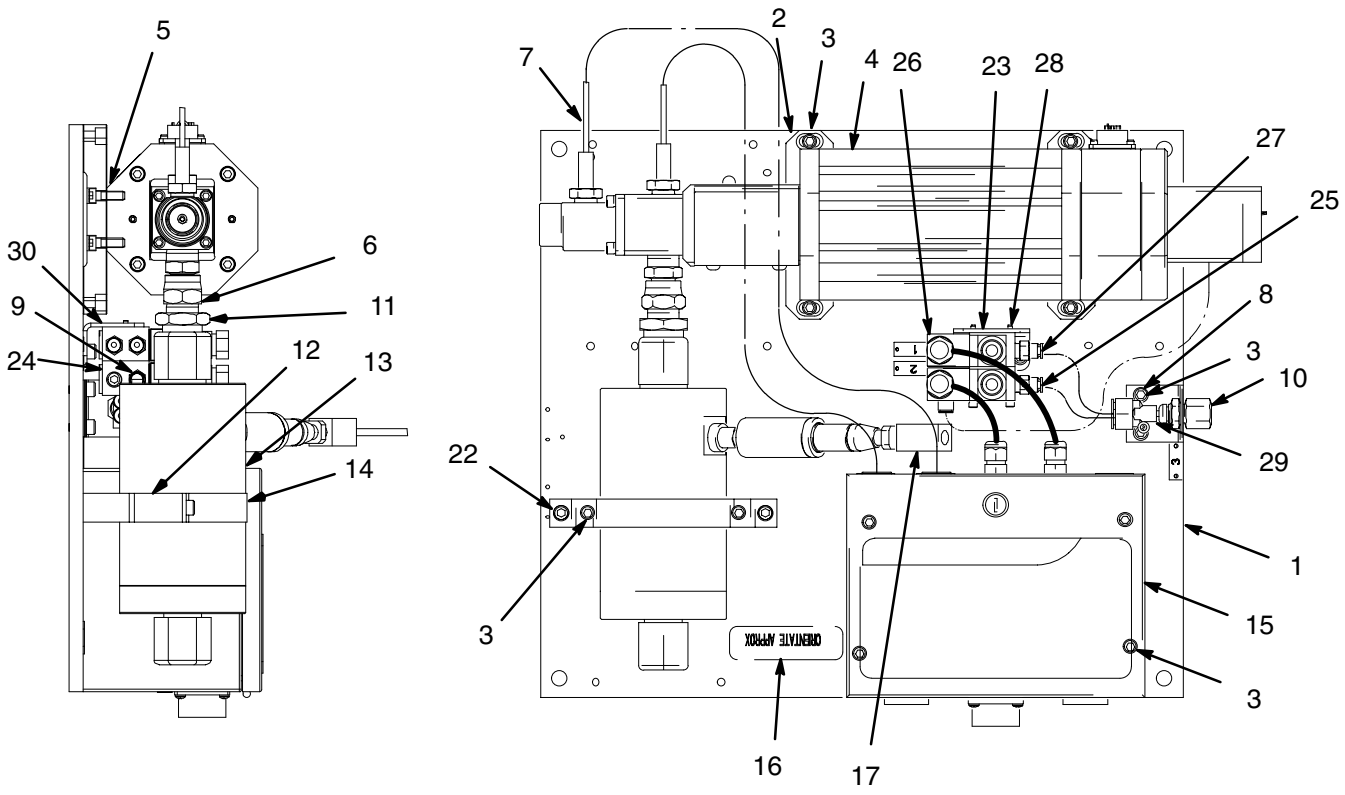


Ref. No.	Part No.	Description	Qty.
1	198186	PLATE, fluid, RS	1
2	198317	BRACKET, mnt, valve, metering	1
3	107530	SCREW, cap, sch, hex	14
4	244920	VALVE, assy, metering, low flow (see manual 309382)	1
5	111788	SCREW, cap, sch	4
6	156684	UNION, adapter	1
7	198082	SENSOR, pressure	2
8	115713	BRACKET, tube	1
10	198179	FITTING, bulkhead, union	1
11	198183	BOX, junction	1
12	198315	BLANK, label kit	1
15	054753	TUBE, nylon, RD, black	1
16	198683	WIRE, 3 cond, 22 gauge	2
17	198446	VALVE, dispense, closer	2

Ref. No.	Part No.	Description	Qty.
18	C19252	PIPE, 1/8 c'snk pipe, PL 5017–50	1
19	C06061	MUFFLER, sintered, dia 1/8	2
20	196108	PLUG, assy, 100v light, numatics	2
21	198177	FITTING, push, straight	4
22	198351	SCREW, cap, M3X.5 X 50	2
23	198175	FITTING, push	1
24	162449	FITTING, nipple, reducing	1
25	239716	GEAR, meter assy, G3000 (see manual 308778)	1
26	198676	BRACKET, G3000, plate, fluid, elec	1
27	110501	SCREW, cap, sch(M6 X 8)	2
28	198171	FITTING, elbow	1
29	198578	HARNESS, cable, w/connector G3000	1
30	198808	BRACKET, solenoid, plate, fluid, elec	1

Parts

PrecisionFlo XL Fluid Plate, Low Viscosity, Electric Regulator, Helical Meter (Part No. 233654)

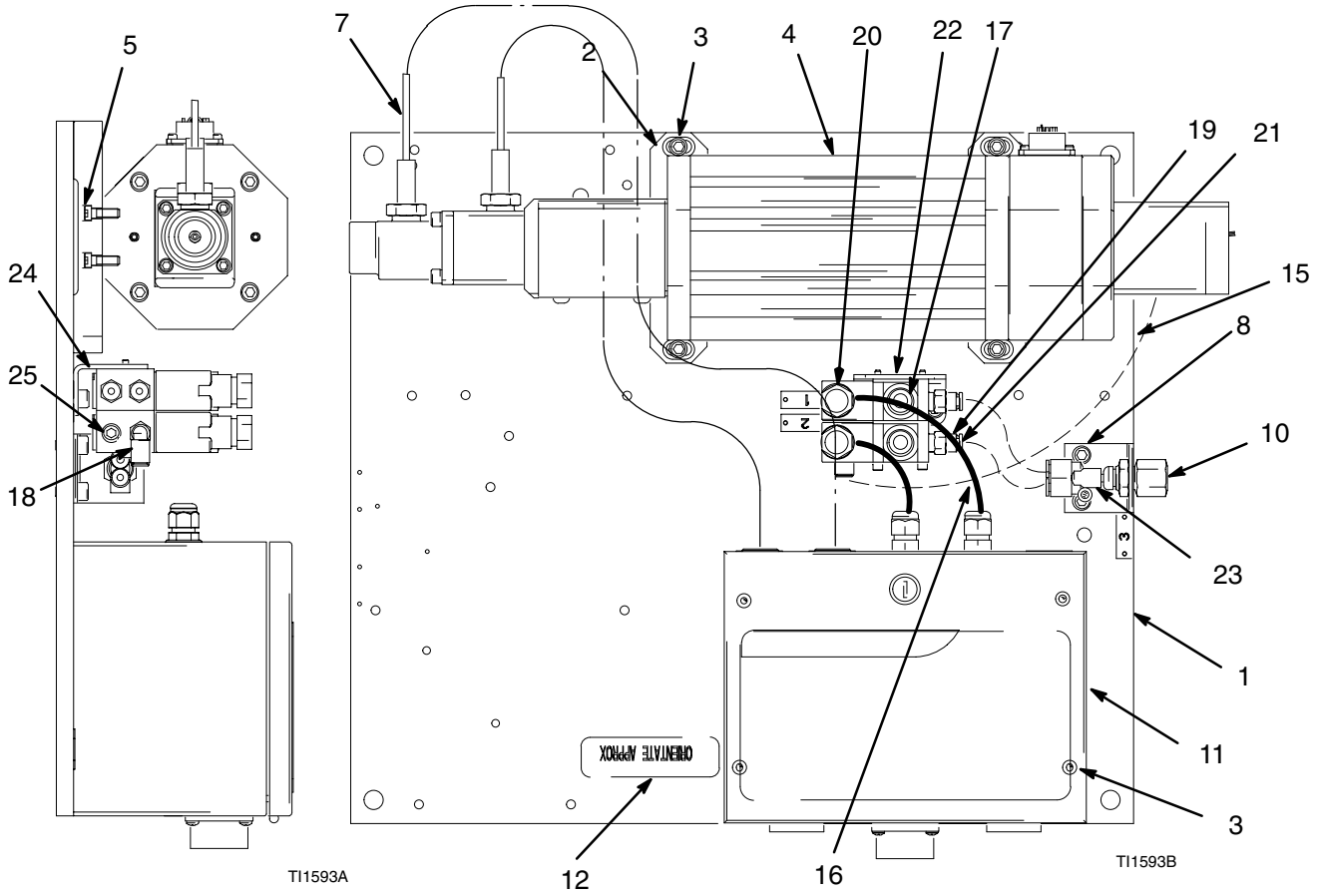


Ref. No.	Part No.	Description	Qty.
1	198186	PLATE, fluid, RS	1
2	198317	BRACKET, mnt, valve, metering	2
3	107530	SCREW, cap, sch, hex	14
4	244920	VALVE, assy, metering, low flow (see manual 309382)	1
5	111788	SCREW, cap, sch	4
6	156684	UNION, adapter	1
7	198082	SENSOR, pressure	2
8	115713	BRACKET, tube	1
9	198171	FITTING, elbow	1
10	198179	FITTING, bulkhead, union	1
11	157191	FITTING, adapter	1
12	198318	BRACKET, mnt, SRZ40, elec, F plate	1
13	617418	METER, fluid flow with fittings (see manual 308968)	1
14	198244	BRACKET, mounting	1

Ref. No.	Part No.	Description	Qty.
15	198183	BOX, junction	1
16	198315	BLANK, label kit	1
17	198579	HARNESS, cable SRZ40	1
20	054753	TUBE, nylon, RD, black	1
21	198683	WIRE, 3 cond, ww gauge	1
22	110580	SCREW, cap, socket HD	2
23	198446	VALVE, dispense closer	2
24	C19252	PIPE, 1/8 c'snk, pipe PL 5017–50	1
25	C06061	MUFFLER, sintered, dia 1/8	2
26	196108	PLUG, assy, 100v light, numatics	2
27	198177	FITTING, push, straight	4
28	198351	SCREW, cap, M3X.5 X 50	2
29	198175	FITTING, push	1
30	198808	BRACKET, solenoid, plate, fluid, elec	1

Parts

PrecisionFlo XL Fluid Plate, High Viscosity, Electric Regulator,No Flow Meter (Part No. 233672)

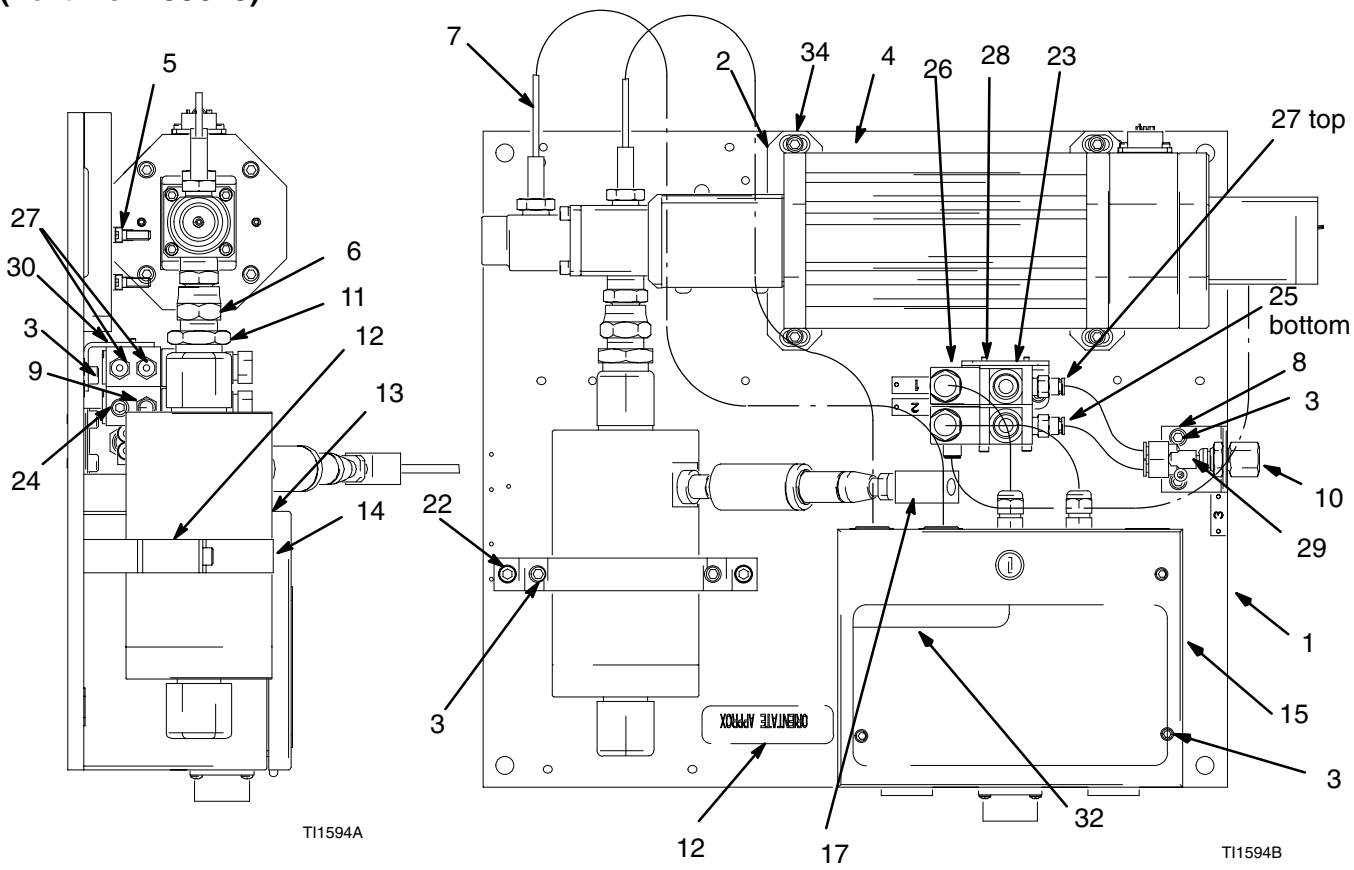


Ref. No.	Part No.	Description	Qty.
1	198186	PLATE, fluid, RS	1
2	198317	BRACKET, mnt, valve, metering	2
3	107530	SCREW, cap, sch, hex	12
4	244921	VALVE, assy, metering, low flow (see manual 309382)	1
5	111788	SCREW, cap, sch	4
7	198082	SENSOR, pressure	2
8	115713	BRACKET, tube	1
10	198179	FITTING, bulkhead, union	1
11	198183	BOX, junction	1
12	198315	BLANK, label, kit	1

Ref. No.	Part No.	Description	Qty.
15	054753	TUBE, nylon, rd, black	1
16	198683	WIRE, 3 cond, 22 gauge	1
17	198446	VALVE, dispense, closer	2
18	198171	FITTING, elbow	1
19	C06061	MUFFLER, sintered, dia 1/8	2
20	196108	PLUG, assy, 100v light, numatics	2
21	198177	FITTING, push, straight	4
22	198351	SCREW, cap, M3X.5 X 50	2
23	198175	FITTING, push	1
24	198808	BRACKET, solenoid, plate, fluid, elec	1
25	C19252	PIPE, 1/8 c'snk pipe, PL 5017–50	1

Parts

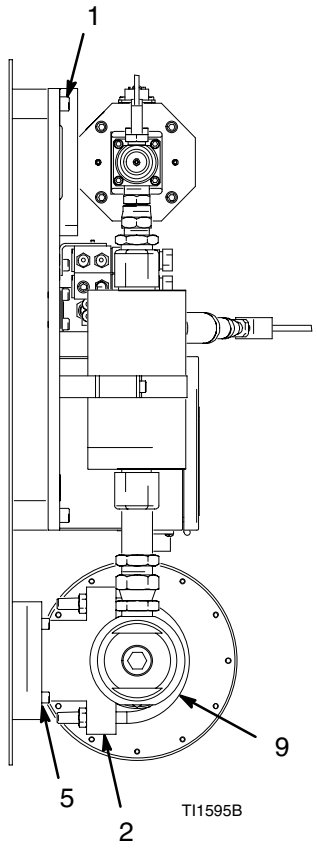
PrecisionFlo XL Fluid Plate, High Viscosity, Electric Regulator, Helical Flow Meter (Part No. 233673)

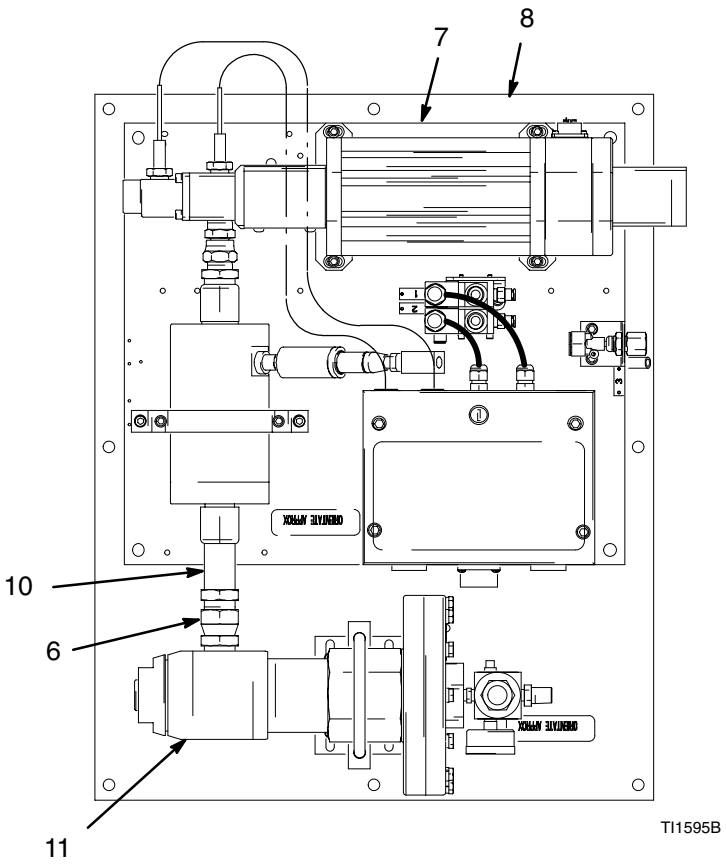


Ref. No.	Part No.	Description	Qty.
1	198186	PLATE, fluid, RS	1
2	198317	BRACKET, mnt, valve, metering	2
3	107530	SCREW, cap, sch, hex	10
4	244921	VALVE, assy, metering, low flow (see manual 309382)	1
5	111788	SCREW, cap, sch	4
6	156684	UNION, adapter	1
7	198082	SENSOR, pressure	2
8	115713	BRACKET, tube	1
9	198171	FITTING, elbow	1
10	198179	FITTING, bulkhead, union	1
11	157191	FITTING, adapter	1
12	198318	BRACKET, mnt, SRZ40, elec, F plate	1
13	617418	METER, SRZ40 (see manual 308968)	1
14	198244	BRACKET, mounting	1
15	198183	BOX, junction	1
16	198315	BLANK, label kit	1
17	198579	HARNESS, cable SRZ40	1
20	054753	TUBE, nylon, RD, black	1
21	198683	WIRE, 3 cond, 22 gauge	1
22	110580	SCREW, cap, socket, HD	2
24	C19252	PIPE, 1/8 c'snk pipe, PL 5017–50	1
25	C06061	MUFFLER, sintered, dia 1/8	2
26	198108	PLUG, assy, 100v light, numatics	2
27	198177	FITTING, push, straight	4
28	198351	SCREW, cap, sch	2
29	198175	FITTING, push	1
30	198808	BRACKET, solenoid, plate, fluid, elec	1
32	198191	LABEL, plates, fluid,	1
33	C19736	SCREW, drive	6
34	108328	SCREW, cap, sch, hex	4

Parts

PrecisionFlo XL Fluid Plate, High Viscosity, Electric Regulator, Helical Flow Meter and Integrated Mastic Regulator (Part No. 245315)

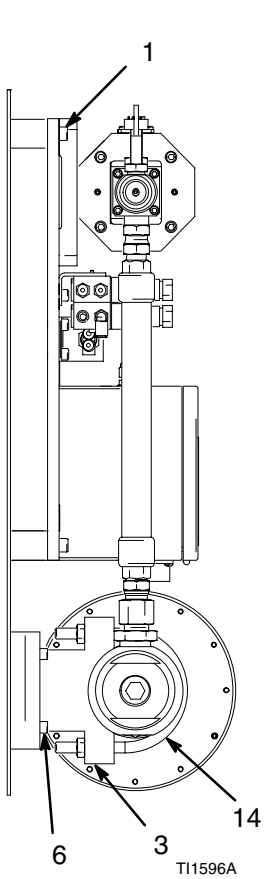


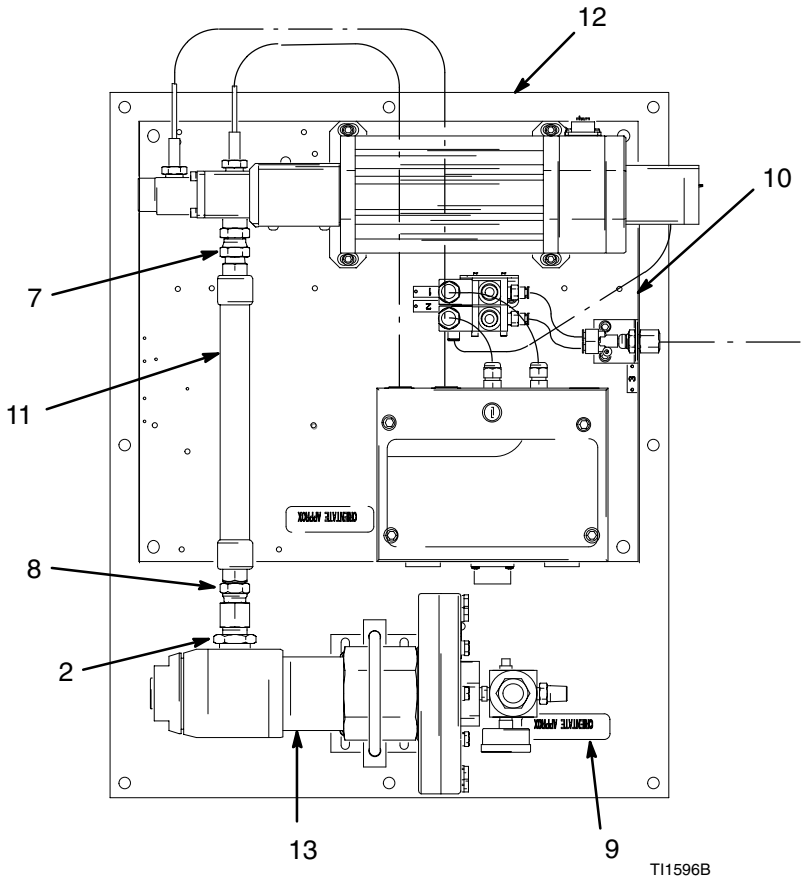


Ref. No.	Part No.	Description	Qty.
1	101864	SCREW, cap, sch	4
2	C59588	BRACKET, regulator	1
5	112166	SCREW, cap, sch	4
6	157785	UNION, swivel	1
7	233673	PLATE, fluid, elec, H flow, SRZ 40 (see page 27)	1
8	245314	BASE, plate, mnt, integrated reg	1
9	C20458	BOLT, u	1
10	C20488	FITTING, nipple, hex, SST	1
11	961635	REGULATOR, mastic, 5000 psi (see manual 307517)	1

Parts

PrecisionFlo XL Fluid Plate, High Viscosity, Electric Regulator, No Flow Meter, Integrated Mastic Regulator (Part No. 245316)





Ref. No.	Part No.	Description	Qty.
1	101864	SCREW, cap, sch	4
2	166443	NIPPLE, hex	1
3	C59588	BRACKET, regulator	1
6	112166	SCREW, cap, sch	4
7	158256	UNION, swivel	1
8	161077	FITTING, union, adapter, straight	1
9	198315	BLANK, label, kit	1
10	233672	PLATE, fluid, elec, H flow (see page 26)	1
11	238370	HOSE, coupled, 1 ft.	1
12	245314	BASE, plate, mnt, integrated reg	1
13	961635	REGULATOR, mastic, 5000 psi (see manual 307517)	1
14	C20458	BOLT, u	1

Pneumatic Regulator Technical Data

Category	Data
Maximum Fluid Inlet Pressure	5000 psi (34.5 MPa, 345 bar)
Maximum Fluid Working Pressure	3500 psi (24 MPa, 240 bar)
Fluid Pressure Operating Range	500 to 3500 psi (3.5 to 24 MPa, 35 to 240 bar)
Air Pressure Requirements	60 to 120 psi (0.4 to 0.83 MPa, 4 to 8.3 bar)
Fluid Flow Rate Range	0 to 3000 cc per minute*
Air Inlet	1/4 npt(f)
Air Outlets, open and close to dispense valve	4 mm or 5/32” tube fittings
Electric Power Requirements	120 volt ac, 1 phase, from PrecisionFlo XL control
Height	8 inches (203 mm) (varies with model)
Weight	60 lbs. (27.24 kg) (varies with model)
Fluid Specifications	For use when dispensing fluids that meet at least one of the following conditions for non-flammability: • The fluid has a flash point above 140°F (60°C) and a maximum organic solvent concentration of 20%, by weight, per ASTM Standard D93. • The fluid does not sustain burning when tested per ASTM Standard D4206 Sustained Burn Test.
Fluid Viscosity Range	10,000 cps to 1,000,000 cps*
Maximum Fluid Temperature	176°F (80°C)
Ambient Air Temperature Range	40 to 120° F (5 to 50° C)
Wetted Parts	303, 304, 321 stainless steel (SST), tungsten carbide, chrome-plated 17–4 PH SST, 15–5 PH SST, braze, cast polyurethane, buna-n, Viton®, PTFE
Noise Data Continuous operator (full current)	 70 dBA
Dispensing device exhaust (with muffler, peak-hold)	84 dBA

** Flow rate is dependent upon material viscosity, tip size and supply pressure.*

Viton® is a registered trademarks of the DuPont Company.

PrecisionFlo™ XL is a trademark of Graco, Inc.

Electric Regulator Technical Data

Category	Data
Maximum Fluid Inlet Pressure	5000 psi (34.5 MPa, 345 bar)
Maximum Fluid Working Pressure	3500 psi (24 MPa, 240 bar)
Fluid Pressure Operating Range	500 to 3500 psi (3.5 to 24 MPa, 35 to 240 bar)
Air Pressure Requirements	60 to 120 psi (0.4 to 0.83 MPa, 4 to 8.3 bar)
Fluid Flow Rate Range	0 to 3000 cc per minute*
Air Inlet	1/4 npt (f)
Air Outlets, open and close to dispense valve	4 mm or 5/32” tube fittings
Electric Power Requirements	120 volt ac, 1 phase, from PrecisionFlo XL control
Analog Control Signal from Robot	0 to 10 volt
Response Time: close to fully open	15 milliseconds
Accuracy: repeatability to set point	▯ 5%
Height	8 inches (203 mm) (varies with model)
Weight	60 lbs. (27.24 kg) (varies with model)
Fluid Specifications	For use when dispensing fluids that meet at least one of the following conditions for non-flammability: ● The fluid has a flash point above 140°F (60°C) and a maximum organic solvent concentration of 20%, by weight, per ASTM Standard D93. ● The fluid does not sustain burning when tested per ASTM Standard D4206 Sustained Burn Test.
Fluid Viscosity Range	10,000 cps to 1,000,000 cps*
Maximum Fluid Temperature	176°F (80°C)
Ambient Air Temperature Range	40 to 120° F (5 to 50° C)
Wetted Parts	303, 304, 321 stainless steel (SST), tungsten carbide, chrome-plated 17–4 PH SST, 15–5 PH SST, braze, cast polyurethane, buna-n, Viton®, PTFE
Noise Data Continuous operator (full current)	70 dBA
Dispensing device exhaust (with muffler, peak-hold)	84 dBA
Closer exhaust (through restricter)	76 dBA
Metering Valve	See Form 308601 for data
Dispense Device	See the dispense device documentation

** Flow rate is dependent upon material viscosity, tip size and supply pressure.*

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Technical Data

Fluid line connection size chart

Model Number	Fluid Inlet	Fluid Outlet
198184	1/2 - 14 npt female	1/2 - 14 npt female
198185	1/2 - 14 npt female	1/2 - 14 npt female
198187	3/4 - 14 npt female	3/4 - 14 npt female
199188	3/4 - 14 npt female	3/4 - 14 npt female
198245	3/4 - 14 npt female	3/4 - 14 npt female
198246	3/4 - 14 npt female	1/2 - 14 npt female
198247	1/4 - 18 npt female	1/2 - 14 npt female
233652	1/2 - 14 npt female	1/2 - 14 npt female
233653	1/4- 18 npt female	1/2 - 14 npt female
233654	3/4 - 14 npt female	1/2 - 14 npt female
233672	1/2 - 14 npt female	1/2 - 14 npt female
233673	3/4 - 14 npt female	1/2 - 14 npt female
245315	3/4 - 14 npt female	1/2 - 14 npt female
345316	3/4 - 14 npt female	1/2 - 14 npt female

For installation mounting dimensions
see pages 9 and 10.

Notes

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.

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