

# PFS Rotameter

## Variable Area Flowmeter

### Instruction Manual

PFS-RM320 and RM400

**Please note:**

This instruction manual provides detailed information and instructions that must be read, understood and followed to ensure that the equipment is installed, operated and serviced in an appropriate manner. Failure to do so before using may result in hazardous consequences and/or improper operation.

Manufactured by:



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## Introduction

The following instructions are to provide information on the installation, operation and maintenance of PFS Rotameter manufactured by Primary Fluid Systems Inc. The rotameters are designed to measure the flow rate with high accuracy, and it has a polycarbonate body which improves impact-resistance and provides an optically clear view.

Various materials of construction are available dependent on the requirements of the application and the type of fluids being transferred.

## Features of PFS Rotameter:

- Clear polycarbonate tube
- Available in four connection types (SW, NPT, BSPT, Flanged)
- Available in 2 capacities (ranging from 0.1 to 1 GPM [0.38 – 3.8 L/min] and 0.45 to 4.5 GPM [1.7 – 17 L/min])
- Available in 4 connection sizes (1" to 2")
- Four end materials available, including PVC, CPVC, PP, and PVDF
- User-friendly design
- Dual scale on all models, showing both GPM and L/min (*optional L/H*)
- Highly visible scale
- Highly visible red float for reading at a glance
- No power supply required
- Low pressure drop (see Page 6)

*For part numbering system, please refer to Exploded View drawing on page 3.*

**Pressure Rating** to 150 PSIG at 68°F (20°C)  
**Maximum Temperature of PVC** to 140°F (60°C)  
**Maximum Temperature of CPVC** to 200°F (93°C)  
**Maximum Temperature of PP** to 180°F (82°C)  
**Maximum Temperature of PVDF** to 250°F (121°C)

*\*See page 7*

## Removal from Package Instructions:

Carefully remove the PFS Rotameter from the cardboard product container.

Before installation, and to ensure proper operation, the blue mesh around the FLOAT (item 2) must be removed. *This mesh is for shipping purposes only.*

## Disassembly:

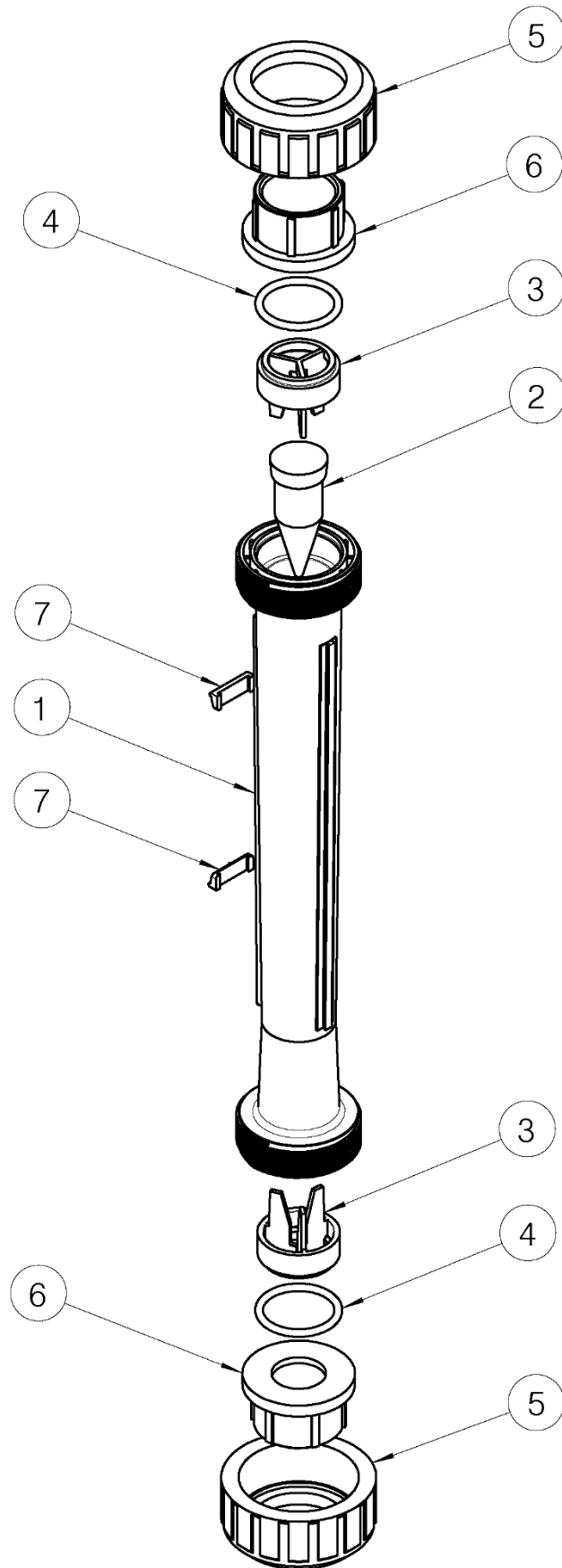
Un-thread the Union Nut (item 5) from the top of the rotameter, and pull out the o'ring (item 4), float blocker (item 3) and connection insert (item 6) and set all pieces aside. Slide the float out carefully and remove the blue mesh from it. The blue mesh can be discarded.

Remove the bottom Union Nut, o'ring, float blocker, and connection insert.

Leave parts aside as you proceed to installation step on page 4.

# Rotameter Exploded View Drawing

Item	Description
1	Tube
2	Float
3	Blocker
4	O'ring
5	Union Nut
6	Union Insert
7	Flow Marker



## Installation on the System Piping:

*NOTE: PFS Rotameter must be mounted vertically to function and operate as intended.*

Allow sufficient space for mounting Rotameter while ensuring that piping is properly supported, aligned and free from pipe stress and vibrations.

The PFS Rotameter is available with three (3) types of connections. Please follow the directions below according to your connection type.

### Solvent Socket Installation for PVC, CPVC, PP & PVDF Units:

Refer to Figure 1.

Slide the Union Nut (Item 5) over the plain end of the connecting pipe.

Follow the thermoplastic manufacturers' and local plumbing code recommendations. Use appropriate primer and glue when installing the Rotameter socket connections to your pipe.

Repeat for both ends.

Re-assemble Rotameter per instructions on page 5.

### Threaded Installation for PVC, CPVC, PP & PVDF Units:

Refer to Figure 1.

Slide the Union Nut (Item 5) over the plain end of the connecting pipe.

Follow the thermoplastic manufactures and local plumbing codes. Apply a proper thermoplastic thread sealant and tape to threads.

Thread the Connection Insert (item 6) to the connecting pipe; finger tighten plus 1 or 2 turns only.

**Warning:** Do not over-tighten. Adding too much tape and sealant and over-tightening can cause thermoplastic pipe and fittings to split. Failure may damage instrument and void warranty.

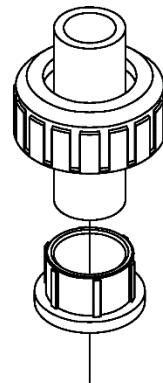
Repeat for both sides.

Re-assemble Rotameter per instructions on page 5.

### Flanged Installation for PVC, CPVC, PP & PVDF Units:

Follow standard recommendations or procedures supplied by your thermoplastic supplier.

Figure 1



## **Fusion Weld Installation for PP and PVDF Units:**

Socket style is supplied.

In socket welding, the pipe end and socket fittings are heated to welding temperature by means of a socket and spigot heater inserts.

Please follow the directions given by various fusion weld equipment manufacturers.

## **Re-assembly**

Begin by reassembling the bottom of the unit first.

1. Insert the float (item 2) with the point or bottom of the float towards the bottom of the scale.
2. Insert the float blocker (Item 3) and the O-ring (Item 4); with the surface of the Connection Surface (Item 6) in contact with the O-ring and the blocker.
3. Slowly tighten the union nut (item 5)

**Warning:** Do not use pipe wrenches or straps to tighten union nut; hand tighten to snug. Failure may damage instrument and void warranty.

Repeat steps 2 and 3 for the top connection.

## **Operation**

Ensure that the Rotameter is connected and leak-free.

Slowly regulate flow of the fluid media to the Rotameter; this prevents damage to the internals of the instrument from sudden surges.

The flow rate is read from the provided scale, using the top of the float as the reference.

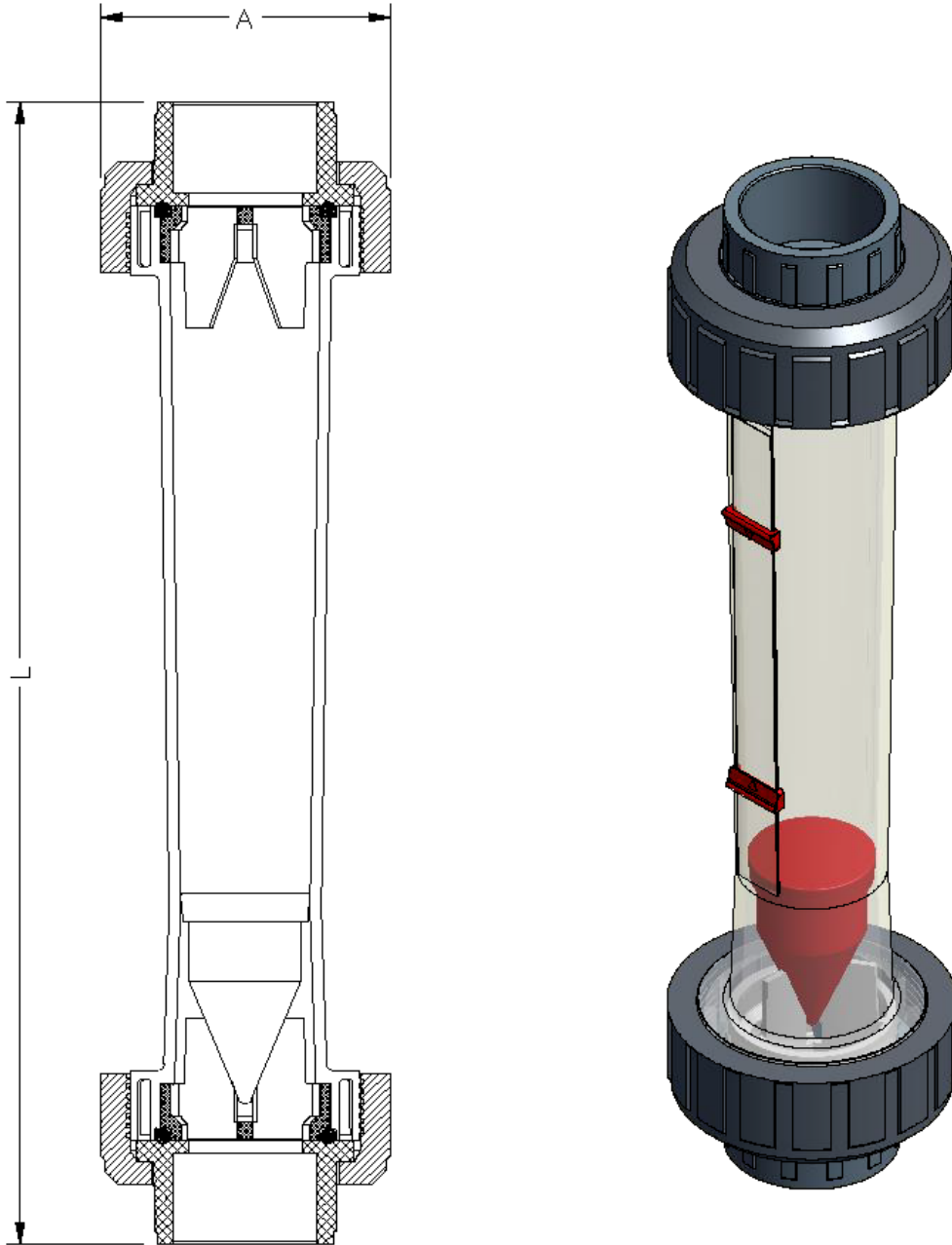
## **Maintenance**

The PFS Rotameter is designed for clean filter fluids for maintenance-free service.

If dirt builds up on the inside components, cleaning of internal instrument tube and float is possible. Simply follow the disassembly and re-assembly instructions in Section A and C. Clean with a simple soap and water solution. Ensure instrument is free of any soap residue before re-installation.

Warning: Do not use solvents or alcohol-based cleaning solutions.

## Dimensional Information and Pressure Drop



ROTAMETER SIZE	L (INCH [mm])	A (INCH [mm])	CONNECTION SIZE	PRESS. DROP (psi)
RM-320	16.14 [410]	4.0 [102]	1"	0.4
	16.34 [415]	4.0 [102]	1-1/4"	0.4
	15.79 [401]	4.0 [102]	1-1/2"	0.4
	16.42 [417]	4.0 [102]	2"	0.4
RM-400	16.14 [410]	4.0 [102]	1"	0.4
	16.34 [415]	4.0 [102]	1-1/4"	0.4
	15.79 [401]	4.0 [102]	1-1/2"	0.4
	16.42 [417]	4.0 [102]	2"	0.4

## Temperature Correction Factors for Thermoplastics

Operating Temperatures		Factors			
F	C	PVC	CPVC	PP	PVDF
70	21	1.00	1.00	1.00	1.00
80	27	1.00	1.00	1.00	1.00
90	32	1.00	1.00	1.00	1.00
100	38	0.90	1.00	1.00	1.00
110	43	0.83	1.00	0.91	1.00
115	46	0.75	1.00	0.87	1.00
120	49	0.66	1.00	0.83	1.00
125	52	0.58	0.97	0.79	1.00
130	54	0.50	0.95	0.75	1.00
140	60	0.33	0.90	0.66	1.00
150	66	NR	0.80	0.60	0.97
160	71	NR	0.70	0.53	0.93
170	77	NR	0.60	0.43	0.86
180	82	NR	0.50	0.33	0.80
200	93	NR	0.33	NR	0.66
210	99	NR	NR	NR	0.60
240	116	NR	NR	NR	0.40
280	138	NR	NR	NR	0.16

NR = Not recommended

### Example:

Maximum Pressure for PVDF valve at 280°F (138°C)

Factor = 0.16 x 150psig = 24 psig max. pressure.

Factor = 0.16 x 1034kPa = 165.44kPa max. pressure.

The maximum pressure rating for valves regardless of size is 150 PSIG (134 kPa) at 73°F (22°C)

**Polycarbonate temperature limit is 250°F (121°C)**

*Primary Fluid Systems Inc. takes no responsibility for the enclosed data.*

## **LIMITED WARRANTY**

Primary Fluid Systems Inc. (Primary) warrants its products against defects in workmanship or materials for one (1) year under normal use.

Primary's obligations and liabilities under this warranty shall be limited to replacement of the product, or a refund of an amount not to exceed the purchase price of the product(s) to which such warranty claim is made. Repairs or replacements are made subject to our inspection of the returned product(s). Primary's decision of one of these alternatives shall be the buyer's exclusive remedy.

This warranty does not extend to damage by corrosion or other decomposition by chemical action. Primary does not warrant damages caused by (a) improper use of the product, (b) unauthorized modification or attachment to product, (c) misuse, abuse, accident or negligent handling or installation of product, or (d) alterations or repairs made by purchaser.

The materials of construction offered are recommendations only, subject in all cases to acceptance by purchaser. These recommendations do not constitute any guarantee against corrosion or decomposition, but are based on previous experience and best available information of the industry.

Statements and instructions set forth herein are based on the best information and practices known to Primary, but it should not be assumed that every acceptable safety procedure is contained herein. Of necessity Primary cannot guarantee that actions in accordance with such statements and instructions will result in the complete elimination of hazards and it assumes no liability for accidents that may occur.

Except as specifically provided herein, Primary makes no warranty, representations, promise or guarantee, either express or implied, statutory or otherwise, with respect to the product and technical information provided, including the products' quality, performance, merchantability, or fitness for a particular purpose.

In no event will Primary be liable for indirect, special, incidental, economic, covert or consequential damages arising out of the use or inability to use the product, including without limitation, damages or costs relating to the loss of profits, business and good will even if advised of the possibility of such damages. In no event shall Primary's liability exceed the amount paid by you for the product.

The warranty and remedies set forth herein are exclusive and in lieu of all others, oral or written, express or implied. No Primary dealer, distributor, agent or employee is authorized to make any modification or addition to this warranty. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.