

INSTALLATION & OPERATION INSTRUCTIONS FOR KOBOLD KFR-1000 THRU KFR-45000 SERIES FLOWMETERS

The KFR-1000 through KFR-45000 acrylic flowmeters are available in various ranges in both SAE and SI units for air and water (see chart on other side). These direct reading meters are also available for other gases and liquids. If the meter will be used with fluids other than air or water, please consult chemical compatibility data for possible effects on the meter. When properly installed and maintained, these durable acrylic meters will provide years of trouble-free operation.

| Specifications | |
|-----------------------------|--|
| Accuracy: | KFR-1000/2000 Series <ul style="list-style-type: none">± 5% Full Scale KFR-3000/45000 Series <ul style="list-style-type: none">± 3% Full Scale |
| Floats: | Black Glass or Stainless Steel |
| Meter Body: | Clear Acrylic |
| Fittings: | Brass or Stainless Steel |
| O-rings: | <ul style="list-style-type: none">NBR O-rings with Brass FittingsFKM O-rings with Stainless Steel fittings |
| Valves: | Brass or Stainless Steel Cartridge Type (Optional) |
| Mounting Inserts: | 10-32 UNF |
| Maximum Temperature: | 150 °F (65 °C) |
| Maximum Pressure: | 100 PSIG (690 kPa) |

UNPACKING

Precautions have been taken to prevent any damage from occurring during shipment. If the meter is received damaged, *report it to your carrier immediately*. Before installing, verify that you have the model and flow range required.

ACHIEVING ACCURATE FLOWRATES

To obtain an accurate flowrate, the float must be read at the position indicated on the meter. If the meter uses a ball float, the flowrate is determined by reading the center of the ball. Additionally, the flowmeter should be installed in a manner, which minimizes both external vibrations and internal flow variations. Special care should be taken so that the connections to the meter's inlet and outlet fittings do not overly restrict the liquid or gas flow being metered. This could result in a reduced flow volume, preventing the meter from reaching its maximum flowrate. Furthermore, internal pressures could be affected, which can cause inaccurate flow readings. On start-up, slowly purge any fluid trapped in the meter.

INSTALLATION

These meters are supplied with a 5/8" or 7/8" hex nut on the inlet and outlet fittings. When installing 1/8" MNPT or 1/4" MNPT fittings into the meter, **place the appropriate size wrench on the hex to prevent the inlet/outlet fitting from rotating. Torque only to 60 in-lbs.** Failure to do so will cause the fitting to rotate, and may damage the meter body, causing leaks and/or meter failure. Use pipe thread sealant or PTFE tape to ease installation and provide a better seal. This meter is supplied with #10-32 threaded inserts for mounting. When installing, use slotted screws and torque to a maximum of 35 in-lbs. Mounting dimensions are shown in the figure on the reverse side.

CLEANING AND DISASSEMBLY

Occasional cleaning may be required if dirt appears in the flow tube or if float movement becomes restricted. To clean, remove the top plug and remove the float. Wash the tapered hole and top plug with a mild liquid detergent and soft brush. Rinse all parts with clean water and dry thoroughly with clean air or nitrogen. **Do not use solvents to clean this meter** as they will attack the acrylic and destroy the meter.

REASSEMBLY

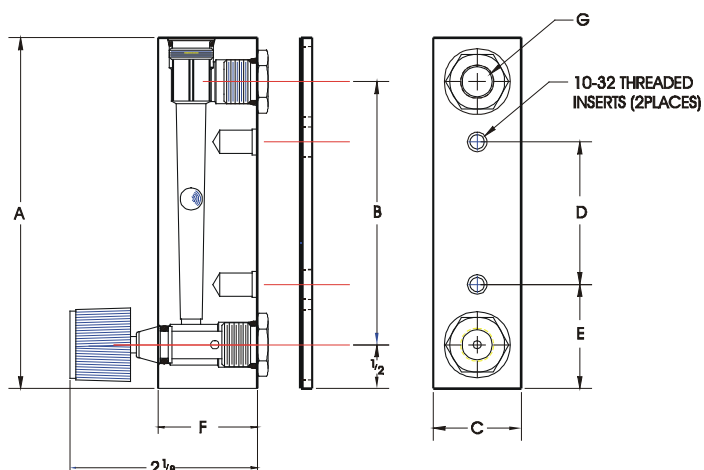
Check to make sure that all parts are clean and dry. To lubricate the o-rings, apply a small amount of halocarbon grease prior to reassembly. If applicable, reinstall the rod guide assembly into the flowmeter body. Make sure the rod guide is seated firmly in the body of the meter. Reinstall the top plug, making sure that the rod guide is properly aligned. If you have any questions regarding the installation, maintenance or use of this flowmeter, please call one of our friendly engineers at (412) 788-2830.

CAUTION

THIS FLOWMETER IS DESIGNED FOR USE WITH NON-HAZARDOUS FLUIDS AT PRESSURES UP TO 100 PSI (690 kPa) AND TEMPERATURES UP TO 150 °F (65 °C). DO NOT USE HAZARDOUS FLUIDS AND DO NOT EXCEED TEMPERATURE OR PRESSURE LIMITS. USE WITH HAZARDOUS FLUIDS OR EXCEEDING THE PRESSURE AND TEMPERATURE LIMITS MAY CAUSE FAILURE WHICH COULD RESULT IN INJURY.

| Dimensions | | KFR-1000/2000 | KFR-3000/4000 | KFR-35000/45000* |
|------------|------|---------------|---------------|------------------|
| A | inch | 4 | 6 ½ | 6 5/8 |
| | mm | 102 | 165 | 168 |
| B | inch | 3 | 5 ½ | 5 1/2 |
| | mm | 76.2 | 140 | 140 |
| C | inch | 1 | 1 3/8 | 1 1/8 |
| | mm | 25.4 | 34.9 | 28.6 |
| D | inch | 1 5/8 | 3 ½ | 3 ½ |
| | mm | 41.3 | 88.9 | 88.9 |
| E | inch | 1 3/16 | 1 1/2 | 1 1/2 |
| | mm | 30.2 | 38.1 | 38.1 |
| F | inch | 1 1/8 | 1 1/8 | 1 3/8 |
| | mm | 29.6 | 28.6 | 34.9 |
| G | inch | 1/8" FNPT | 1/8" FNPT | 1/4" FNPT |
| | mm | | | |

* Does not include an 1/8" back plate!



| KFR-1000/2000 Series Flow Rates | | | |
|---------------------------------|-------------|---------------------|-------------|
| Range | Model | Range | Model |
| SCFH of Air | KFR- | LPM of Air | KFR- |
| 0.1-1 | 2100, 2200 | 0.04-0.5 | 2112, 2212 |
| 0.2-2 | 2101, 2201 | 0.1-1 | 2113, 2213 |
| 0.4-5 | 2102, 2202 | 0.2-2.5 | 2129, 2229 |
| 1-10 | 2103, 2203 | 0.4-5 | 2114, 2214 |
| 4-50 | 2106, 2206 | 1-10 | 2115, 2215 |
| 10-100 | 2107, 2207 | 2-25 | 2116, 2216 |
| 20-200 | 2108, 2208 | 6-50 | 2117, 2217 |
| | | 10-100 | 2118, 2218 |
| | | GPH of Water | KFR- |
| CCM of Water | KFR- | 0.2-2 | 1118, 1218 |
| 10-100 | 2110, 2210 | 0.4-5 | 1119, 1219 |
| 20-240 | 2111, 2211 | 1-10 | 1120, 1220 |
| | | 2-20 | 1121, 1221 |
| | | 4-40 | 1122, 1222 |

| KFR-35000/45000 Flow Rates | | | |
|----------------------------|--------------|---------------------|--------------|
| Range | Model | Range | Model |
| SCFM of Air | KFR- | LPM of Air | KFR- |
| 0.5-5 | 45167, 45267 | 14-140 | 45172, 45272 |
| 1-10 | 45165, 45265 | 30-300 | 45170, 45270 |
| ** 4-20 | 45168, 45268 | ** 100-560 | 45173, 45273 |
| GPM of Water | KFR- | LPM of Water | KFR- |
| 0.25-2.5 | 35164, 35264 | 1-10 | 35169, 35269 |
| 0.5-5 | 35166, 35266 | 2-20 | 35171, 35271 |

Note: The KFR-35000/45000 series models are dual scale units (i.e. SCFM/ SCFH, GPM/GPH, LPM/LPH)

| KFR-3000/4000 Series Flow Rates | | | |
|---------------------------------|-------------|---------------------|-------------|
| Range | Model | Range | Model |
| SCFH of Air | KFR- | CCM of Water | KFR- |
| 0.4-5 | 4130, 4230 | 4-50 | 4138, 4238 |
| 1-10 | 4131, 4231 | 10-120 | 4156, 4256 |
| 4-40 | 4133, 4233 | 25-225 | 4151, 4251 |
| 10-100 | 4134, 4234 | 40-400 | 4150, 4250 |
| 20-200 | 4136, 4236 | 40-660 | 4152, 4252 |
| | | 100-1500 | 4153, 4253 |
| | | 200-3000 | 4154, 4254 |
| | | 300-3700 | 4155, 4255 |
| CCM of Air | KFR- | GPH of Water | KFR- |
| 100-1000 | 4139, 4239 | 1-10 | 3145, 3245 |
| LPM of Air | KFR- | 2-25 | 3146, 3246 |
| 0.4-5 | 4140, 4240 | 6-60 | 3148, 3248 |
| 1-10 | 4141, 4241 | | |
| 2-20 | 4142, 4242 | | |
| 3-30 | 4143, 4243 | SCFM of Air | KFR- |
| 4-50 | 4144, 4244 | 0.3-3 | 4137, 4237 |
| 10-100 | 4147, 4247 | | |

CONTINUED PRODUCT IMPROVEMENT MAY RESULT IN SPECIFICATION REVISIONS

WHEN ORDERING PARTS PLEASE INCLUDE PART DESCRIPTION, ITEM NUMBER AND TYPE OF MATERIAL REQUIRED.

INSTALLATION & OPERATION INSTRUCTIONS

FOR KOBOLD KFR-5000 AND KFR-6000 SERIES FLOWMETERS

The KFR-5000 and KFR-6000 acrylic flowmeters are available in various ranges in both SAE and SI units for air and water (see chart on other side). These direct reading meters are also available for other gases and liquids. If the meter will be used with fluids other than air or water, please consult chemical compatibility data for possible effects on the meter. When properly installed and maintained, these durable acrylic meters will provide years of trouble-free operation.

| Specifications | |
|---|---------------------------|
| Accuracy: | ± 2% Full Scale |
| Float: | Stainless Steel |
| Wetted Parts: | 316 SS, Acrylic, PVC, NBR |
| Panel Mount Valve (Option: PMV1) | 316 SS |
| Meter Body: | Clear Acrylic |
| Fittings: | 1" FNPT PVC |
| O-rings: | NBR |
| Mounting Inserts: | 10-32 UNF |
| Max. Temperature: | 150 °F (65 °C) |
| Max. Pressure: | 100 PSIG (690 kPa) |

UNPACKING

Precautions have been taken to prevent any damage from occurring during shipment. Remove the protective pipe cleaner securing the float from the meter through the appropriate inlet / outlet fitting and discard. If the meter is received damaged, *report it to your carrier immediately*. Before installing, verify that you have the model and flow range required.

ACHIEVING ACCURATE FLOWRATES

To obtain an accurate flowrate, the float must be read at the position indicated on the meter. Additionally, the flowmeter should be installed in a manner, which minimizes both external vibrations and internal flow variations. Special care should be taken so that the connections to the meter's inlet and outlet fittings do not overly restrict the liquid or gas flow being metered. This could result in a reduced flow volume, preventing the meter from reaching its maximum flowrate. Furthermore, internal pressures could be affected, which can cause inaccurate flow readings. On start-up, slowly purge any fluid trapped in the meter.

INSTALLATION

These meters are supplied with round 1" FNPT PVC inlet and outlet fittings. When installing the meter, securely hold the meter's fittings from rotating while connecting the flow lines. (Use pipe thread sealant or PTFE tape to achieve a positive seal when connecting the flowmeter.) **Failure to hold the meter fittings or over-tightening may cause damage to the fitting, flowmeter or both; which will result in leaks or meter failure.** The meter is supplied with #10-32 threaded inserts for mounting. When installing, use slotted screws and torque to a maximum of 35 in-lb. Mounting dimensions are shown in the figure on the reverse side.

CLEANING AND DISASSEMBLY

Occasional cleaning may be required if dirt appears in the flow tube or if float movement becomes restricted. To clean, remove the top plug (standard back) or the outlet fitting (inline) and remove the rod guide assembly. Wash the tapered hole; float stops and top plug with a mild liquid detergent and soft brush. Rinse all parts with clean water and dry thoroughly with clean air or nitrogen. **Do not use solvents to clean this meter** as they will attack the acrylic and destroy the meter.

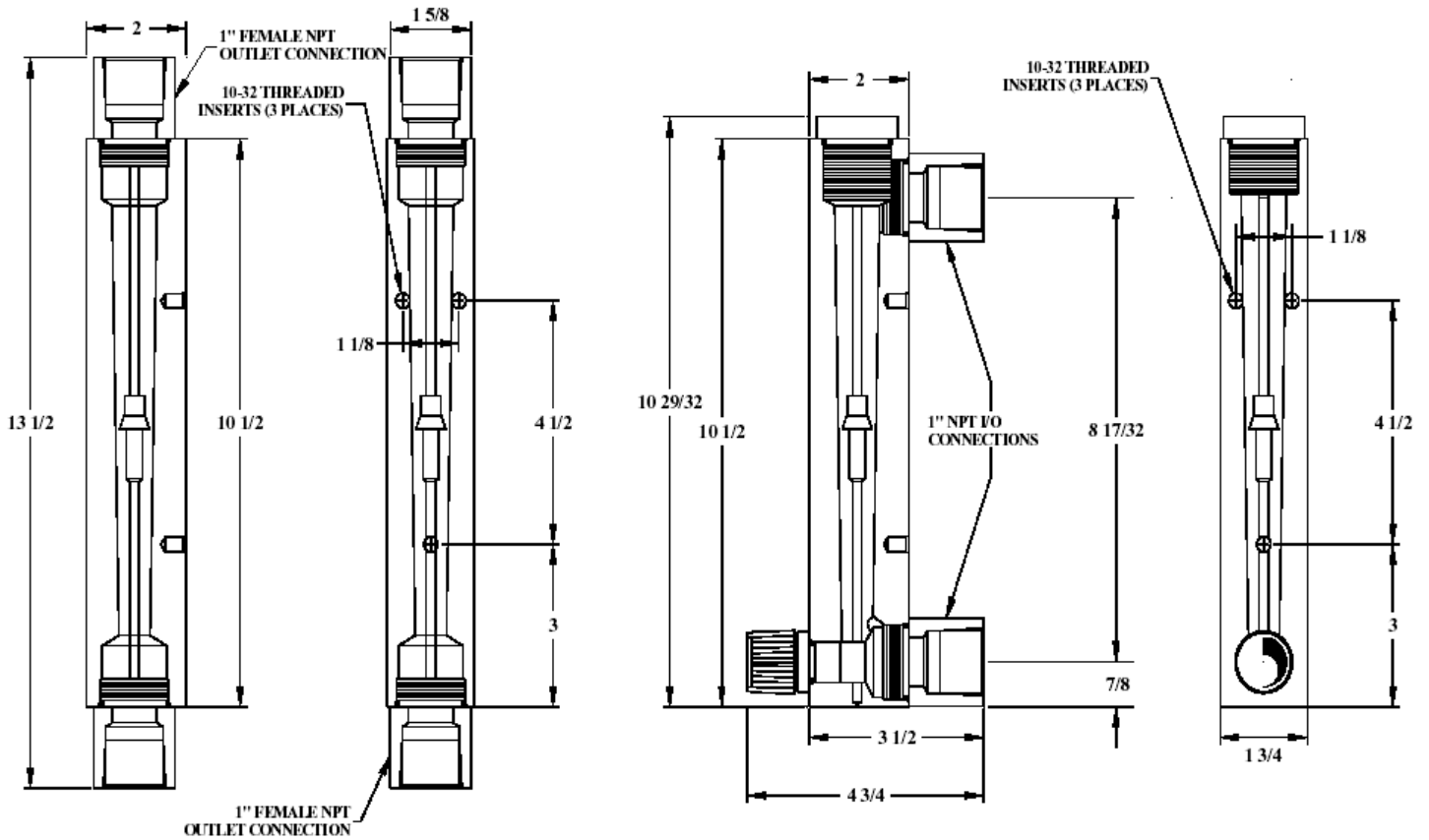
REASSEMBLY

Check to make sure that all parts are clean and dry. To lubricate the o-rings, apply a small amount of halocarbon grease prior to reassembly. Replace the float on the rod guide and reinstall the float stops. Reinstall the rod guide assembly into the flowmeter body. Make sure the rod guide is seated firmly in the body of the meter for a standard back meter or in the inlet fitting of the Inline meter. (For meters with valves, it will be necessary for the rod guide to pass through the slot in the valve tip.) Reinstall the top plug or the outlet fitting, making sure that the rod guide is properly aligned.

If you have any questions regarding the installation, maintenance or use of this flowmeter, please call one of our friendly engineers at (412) 788-2830.

CAUTION

THIS FLOWMETER IS DESIGNED FOR USE WITH NON-HAZARDOUS FLUIDS AT PRESSURES UP TO 100 PSI (690 kPa) AND TEMPERATURES UP TO 150 °F (65 °C). DO NOT USE HAZARDOUS FLUIDS AND DO NOT EXCEED TEMPERATURE OR PRESSURE LIMITS. USE WITH HAZARDOUS FLUIDS OR EXCEEDING THE PRESSURE AND TEMPERATURE LIMITS MAY CAUSE FAILURE WHICH COULD RESULT IN INJURY.



| Inline Meter | | | |
|--------------|----------|-----------|----------|
| SCFM Air | | GPM Water | |
| Range | Model | Range | Model |
| 3-25 | KFR-6350 | 0.4-5 | KFR-5356 |
| 4-50 | KFR-6351 | 1-10 | KFR-5357 |
| 10-100 | KFR-6352 | 2-20 | KFR-5358 |
| LPM Air | | LPM Water | |
| Range | Model | Range | Model |
| 100-700 | KFR-5353 | 1-19 | KFR-5359 |
| 100-1400 | KFR-5354 | 4-36 | KFR-5360 |
| 400-4000 | KFR-5355 | 5-75 | KFR-5361 |

| Panel Mount Meter (optional 316 SS valve shown above - add suffix "V1") | | | |
|---|------------|-----------|------------|
| SCFM Air | | GPM Water | |
| Range | Model | Range | Model |
| 3-25 | KFR-6350PM | 0.4-5 | KFR-5356PM |
| 4-50 | KFR-6351PM | 1-10 | KFR-5357PM |
| 10-100 | KFR-6352PM | 2-20 | KFR-5358PM |
| LPM Air | | LPM Water | |
| Range | Model | Range | Model |
| 100-700 | KFR-5353PM | 1-19 | KFR-5359PM |
| 100-1400 | KFR-5354PM | 4-36 | KFR-5360PM |
| 400-3000 | KFR-5355PM | 5-75 | KFR-5361PM |

CONTINUED PRODUCT IMPROVEMENT MAY RESULT IN SPECIFICATION REVISIONS

WHEN ORDERING PARTS PLEASE INCLUDE PART DESCRIPTION, ITEM NUMBER AND TYPE OF MATERIAL REQUIRED.