

KFF/KFG Low-Volume Flow Meter

User Instructions

KFG_KFF_manual_0304



1. General Information

Please read this service manual carefully before unpacking and readying the unit for operation, and follow the instructions precisely as described herein. These devices may only be installed, used and maintained by skilled personnel who are familiar with this service manual and can observe applicable regulations regarding industrial safety and accident prevention.

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Manufactured and Marketed by:

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3. Suggested Application

The KFF and KFG series flow meters are used for measuring small liquid or gas flows.

These units are configured as follows:

Analog output

In order to transmit the measured flow results, an analog output (0-5 V) is provided. A 500 Hz. max. pulse output is available on some models.

Flow sensor with analog output

Integrated sensor with LCD digital display (3-digit)

The KFF meters may only be used for measurement of low-viscosity, clear fluids (<10 cSt). Measurement of liquids with higher viscosity can result in significant measurement errors.

The KFG meters are calibrated at standard conditions in air (14.7 PSIG, 68° F).

Notes for KFG-1 series:

Non-conventional media, pressures or temperatures may require a user calibration on site, by means of a comparison unit or volumetric test.

Attention! The media to be measured must not be contaminated. In particular, large particles can cause jamming or destruction of the rotor.

4. Operating Principle

KOBOLD flow meter KFG and KFF are being used to measure small and very small flow volumes. The medium to be measured can be in gaseous form (KFG) or in liquid form (KFF). These units function according to Pelton principle, meaning that the flowing medium will set a paddle wheel in rotation. The rotary movement is translated into pulses via photo cells. An electronic integrator uses these pulses to generate a flow proportional, analog output signal (0-5 V).

5. Unit Check-up

These devices are checked before shipment and sent away in perfect condition. Should the damage to a device be visible, we recommend a thorough inspection of the delivery packing. In case of damage, please inform your parcel service/ forwarding agent immediately, since they are responsible for damages occurring during transit.

Scope of delivery

Standard scope of delivery applies:

- Flow meter
- Connection cable with plug: KF-7000
- Instruction manual

6. Mechanical Connection

Before Installation

- Please ensure that the actual flow volume is in agreement with the measuring range of the device. The reference number of measuring range can be read from the item number label.

Note: Continuously exceeding the measuring range can cause damage to bearings.

- Make sure that the maximum operational pressure and temperature are not exceeded.
- Ensure that there is no remaining packing material inside the unit.

KFG:

The calibration of the unit is performed in horizontal position; the item label faces upwards. With other mounting positions, a measured-value deviation of 0.25 %/°C at 50% nominal flow should be taken into consideration.

KFF/KFG:

- Mount the measuring device on desired position. Two mounting flanges are supplied for this purpose. Connect unit to your piping system.
- Do not remove the meter fittings as the calibration may change.

Attention: When tightening fittings, it is necessary to work with two suitable wrenches. A transfer of torque on device's housing while tightening the fittings can result in the destruction of the measuring device.

- Check the sealing of all connections.

7. Electrical Connections

Attention: Ensure that the voltage level of your supply system corresponds with the voltage level required by the measuring device. (+12.5 VDC \pm 2 VDC)

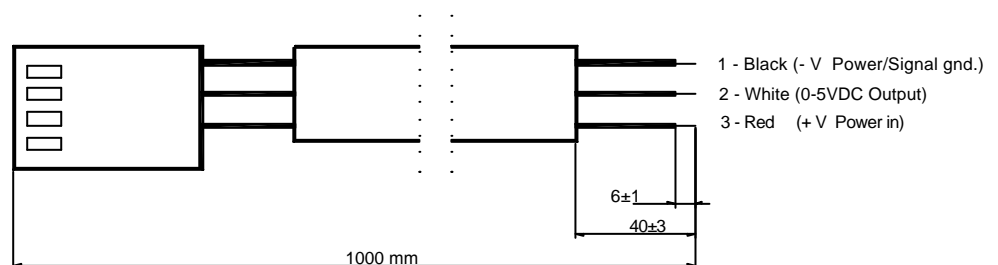
- Make sure that the electrical supply lines are not active.
- Connect the ends of supplied connection cable KF-7000 with your system, according to the wiring diagram shown below. The green wire is used only if the unit has an optional pulse output.

Attention: An incorrect connection can lead to damage of the unit electronics.

Connect the cable plug with the corresponding socket to the measuring device.

- The plug and socket are indexed, so that an incorrect connection is impossible.

KF-7000 Connection Cable Wiring



8. Electrical Commissioning

KFF, KFG

The unit is supplied ready for operation. The electronics are adjusted and calibrated to the sensor. By turning the potentiometer, located on the side of the electronics, the analog output (0-5 V) can be adjusted by using a reference meter if necessary.

9. Mechanical Commissioning

To avoid pressure spikes, flow medium should enter the unit slowly.

Attention: Pressure spikes generated by water hammer or caused by magnetic valves, ball valves or similar devices, can lead to destruction of the unit. During operation it must be ensured that the sensor is completely filled with flow media.

Note: Large air bubbles in the measurement chamber can cause error indications and may destroy the bearings and impeller.

10. Technical Data

Accuracy:	$\pm 3\%$ F.S.
Linearity:	$\pm 3\%$ F.S.
Repeatability:	KFF: $\pm 0.2\%$ F.S. KFG: $\pm 1\%$ F.S.
Mounting Position:	Horizontal
Temperature Range:	32 - 120° F
Maximum Pressure:	KFF: Ryton:100 PSI, Brass:500 PSI, PTFE: 60 PSIG KFG: 40 PSIG
Analog Output:	0-5 VDC
Supply Voltage:	12.5 VDC \pm 2 VDC, regulated
Power Consumption:	35 mA (typical)

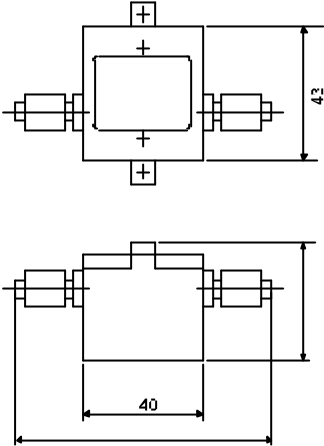
Wetted Materials

All Units: See Current Datasheet

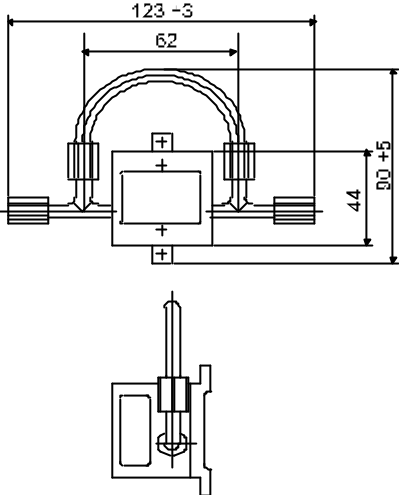
KFF, KFG

11. Dimensions

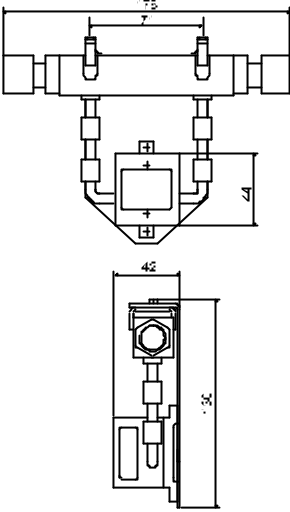
KFF/KFG-1... 1/8 "



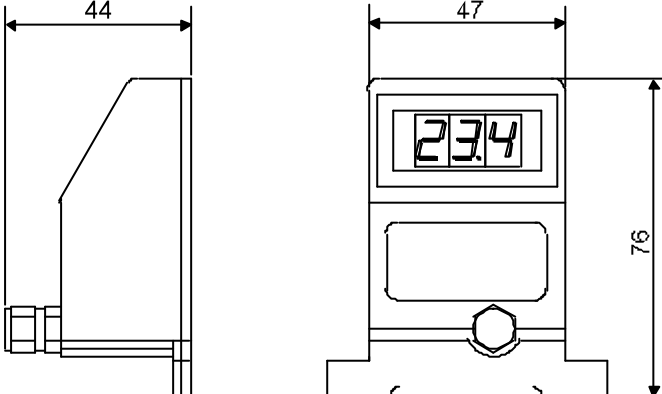
KFF/KFG-1... 1/4"



KFF/KFG-1... 3/8"-1/2"



KFF/KFG-3...



12. Cautionary Information

PLEASE READ THE FOLLOWING GENERAL FLOW METER/MONITOR WARNINGS BEFORE ATTEMPTING INSTALLATION OF YOUR NEW DEVICE. FAILURE TO HEED THE FOLLOWING INFORMATION MAY RESULT IN EQUIPMENT FAILURE AND POSSIBLE SUBSEQUENT PERSONAL INJURY.

- Inspect the instrument for damage upon arrival. Cracked, fractured, or otherwise damaged instruments must not be put into use, since the device is weakened to an unknown extent.
- Under NO circumstances must the maximum tolerances of flow, pressure, temperature, or supply voltage be exceeded.
- The maximum tolerances of the device have been determined using water, air, and/or oil. If using other media, especially corrosive media, it is critically important that the user determine chemical compatibility with our instruments. KOBOLD Instruments Inc. cannot accept responsibility for failure and consequences resulting from the use of media other than water, air, mineral oil or nitrogen.
- The sudden cessation of fluid flow causes what is typically called water hammer. Water hammer is a transient force caused by the transfer of momentum of a flowing fluid to the piping system when the flow of fluid is suddenly stopped (i.e. pump trip or valve closure).
- Water hammer can cause fluid pressure surges, which could cause the flow measuring device's pressure limit to be exceeded, resulting in equipment failure and possible personal injury. These pressure surges can be particularly harmful if the flow instrument is empty since there would be no backpressure in the device. To avoid these pressure surges, the fluid lines should remain full and flow should be introduced and isolated from the system slowly.

Freezing of fluid in the instrument must be avoided since the resultant expansion will damage the flowmeter and make it unsafe for use.