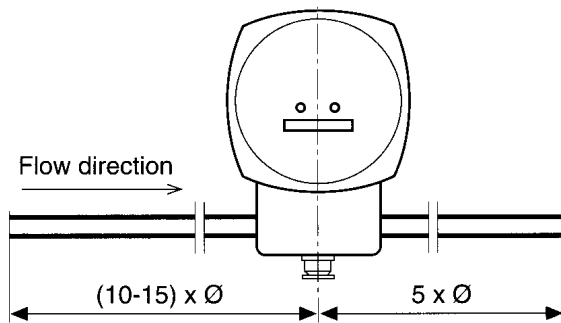


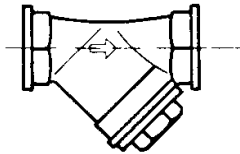
# KOBOLD Series KEL Installation and Operating Instructions

## Installation in Piping



In order to obtain a fully developed flow profile through the instrument, the pipe run should be straight and should not contain any elbows bends or fittings. A free pipe run of 10-15 times the pipe bore upstream and 5 times downstream of the meter is recommended. Hose connection with area reducing hose nipples, if desired, should be installed only after this run.

## Filtration

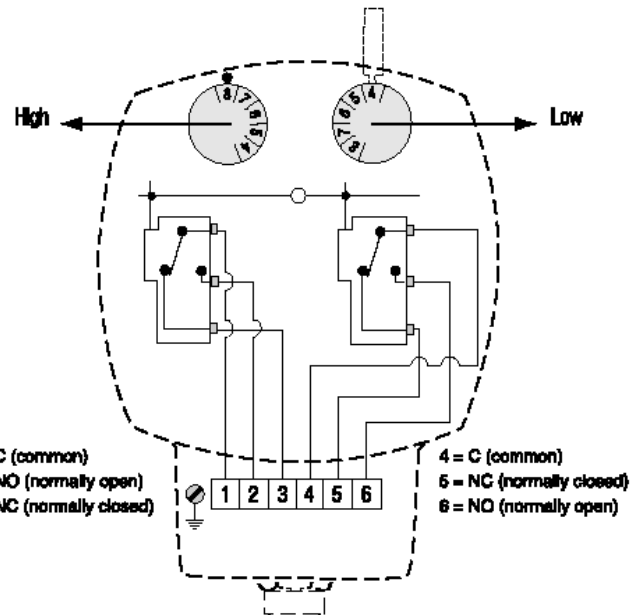


The meter can be installed in any orientation, but should not be installed with the diaphragm housing at the bottom of the pipe, since the housing may then function as a collection point for dirt. If there is a risk that the liquid may contain dirt particles which are larger than the pressure sensing ports, a filter must be installed in the system upstream of the meter.

## Switchpoint Adjustment

Unless otherwise specified on ordering, units are delivered with the switches adjusted so that one switch is set to the minimum flow value ("1" on adjusting dial) and one at maximum flow ("5" on the adjusting dial.) These values can be reset as follows:

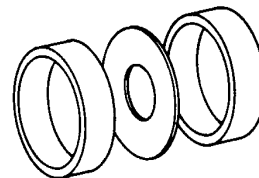
1. Undo the 2 screws which retain the cover on the top of the meter housing. This renders the adjusting dials accessible.
2. The adjusting dials are marked 1 through 5. The 1 through 5 indexing of the dial divides the flow



measuring range into 5 equal parts. If it is desired to have a switchpoint at 50% of maximum flow the switch adjusting dial would be adjusted to 2.5, etc. An adjusting tool is included with the unit and is clipped inside the cover. Adjust the switchpoint with the adjusting tool.

The wiring diagram above illustrates the switching status when the flow is zero.

## Change of Measuring Range



### CHANGE OF MEASURING RANGE

The brass threaded and brass ANSI wafer units can have their measuring ranges easily modified in the field by simply replacing the measuring orifice and scale. To replace the orifice, undo the through bolts which clamp the meter between the flanges in the pipe work. Remove one of the spacer rings which hold the orifice flange in place. On the wafer style units, the spacer rings are fixed by means of 2 screws. Replace the orifice flange with a new one and then replace the spacer ring. Keep in mind that the measuring scale will also need to be replaced with one which has the correct new range on it. Stainless steel threaded and stainless steel wafer style units do not have interchangeable orifices. They require a new pipe section or wafer body in order to change the range.

## Changing The Installation Orientation

Unless otherwise specified upon ordering, the meters are delivered for horizontal installation, flow to the right. If the installation orientation is to be changed, proceed as follows:

1. Remove the protective glass.
2. Push the pointer in towards the dial face and upwards in the direction of the slot. Lift, and pass the round hole in the pointer over the center of the pointer hub.
3. Undo the two screws which hold the dial face in position, turn the dial face 90° in the desired direction and replace the screws.
4. Replace the pointer. The pointer hub and the hole in the pointer are square. The pointer can therefore be mounted in four different positions. Make sure the correct position is chosen. When the meter is stationary, the pointer tip should point towards the beginning of the orange "flow = 0" section on the dial face. Make sure that the pointer is pushed by the spring so that it is engaged by the pointer hub.

## Changing the Flow Direction

If the installation orientation of the meter is changed, the flow direction selector may have to be changed also. This can be accomplished on brass units as follows:

1. Undo the four hex head screws which attach the diaphragm housing to the pipe fitting.
2. The flow direction selector is now accessible and can be replaced by undoing the two screws which hold it in place. Remove the selector.
3. Replace the old selector with the new one. Make sure that all four O-rings are in place, and then refit the screws.
4. Finally, change the direction on red arrow on the outer flow body by 180° to reflect the new flow direction

### Note:

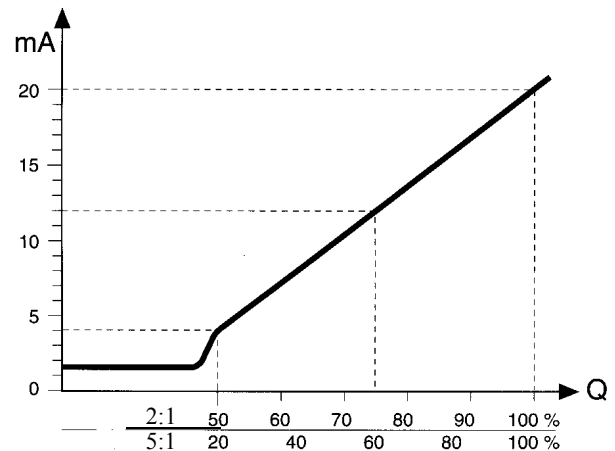
Flow direction selector R is used for installation orientations having flow horizontal-to-the-right, vertical-up-dial-left-of-pipe, or flow vertical-down-dial-right-of-pipe.

Flow direction selector L is used for installation orientations having flow horizontal-to-the-left, vertical-up-dial-right-of-pipe, or flow vertical-down-dial-left-of-pipe. Flow direction changes for the stainless steel threaded and stainless steel wafer style units require new. They require a new pipe section or wafer body in order to achieve a flow direction change.

## 4-20 mA Output Transmitter

The KEL-8000 and KEL-9000 series meters features a 4-20 mA output transmitter which transmits a current signal directly proportional to flow. Unlike traditional 4-20 mA systems, the KEL's output corresponds to the following definition of flow versus current:

- 4 mA = Minimum of flow range  
 1/5 of Max. flow for 5:1 turndown meters  
 1/2 of Max. flow for 2:1 turndown meters
- 20 mA = Maximum of flow range.



This modification to the typical protocol affords the user the maximum possible current range and resolution in the transmitted signal

## Wiring Diagram KEL-8000/9000 Series

