

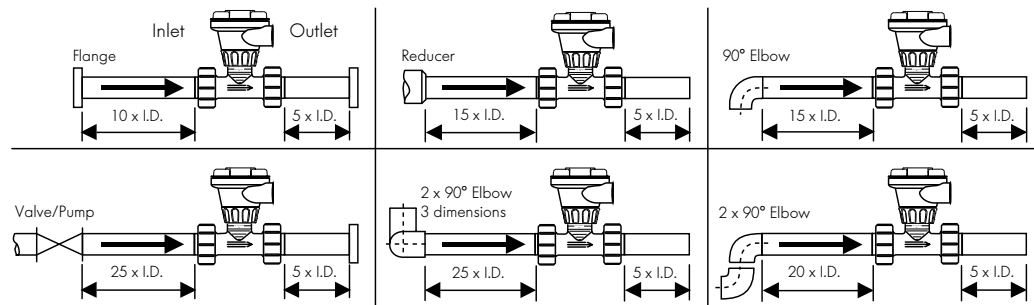
Installation of Flow Sensors: Vortex

Vortex Installation Tips:

- Sensors must be used in full pipes.
- Sensors may be mounted at any angle.
- Observe minimum Reynolds Number and Back Pressure requirements.
- Never install immediately downstream of valves, fittings, etc.
- For optimal performance, it is recommended to choose a piping location with the maximum length of straight un-interrupted pipe lengths upstream of the sensor.

I. Piping Location

- Install the sensor with the arrow pointing in the direction of the flow. These flow sensors are not for bi-directional operation.
- Recommended upstream distances are stated as a multiplier of the I.D. (inner diameter) of the pipe. Note that these multipliers vary and depend upon the type of obstruction.
- Follow these recommended distances to ensure a good flow indication.



II. Mounting Angle

+GF+ SIGNET Vortex Flow Sensors may be mounted at any angle, and in either horizontal or vertical pipe runs, with upward flow preferred in the case of vertical runs.

III. End Connector Options

- Fusion Socket or Solvent Cement Socket

Fusion socket version:

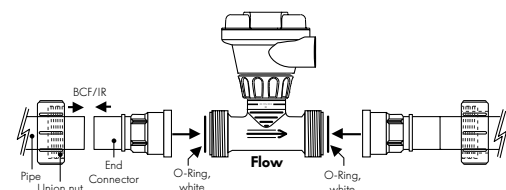
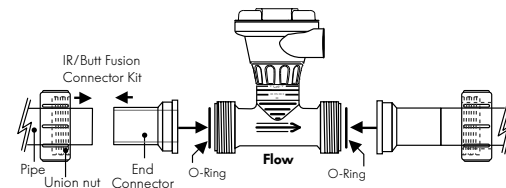
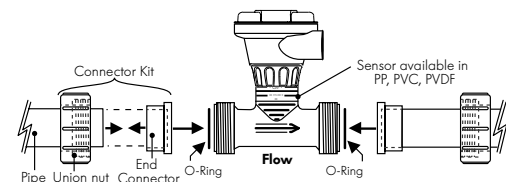
Available in HP-PVDF, PVDF, or PP. A George Fischer Socket Fusion Joining Machine is required to install the end connectors on the pipeline. Refer to the joining machine manual for installation details.

Solvent socket version:

Available in PVC. Follow the PVC cement manufacturer's recommendations for preparation and installation.

- IR/Butt Fusion
Available in PVDF or PP. A George Fischer IR weld or Butt Fusion Joining Machine is required to install the end connections. Refer to the IR weld or butt fusion joining machine manual for installation details.

- BCF/IR Fusion
A George Fischer HP BCF/IR Fusion Joining Machine is required to install the end connections. Refer to the BCF/IR fusion joining machine manual for installation details.



Backpressure Calculation

Minimum downstream pipe backpressure levels are required to prevent cavitation within the sensor. The minimum back pressure is calculated by the following formula:

$$2.7 \times \Delta P + 1.3 \times P_v$$

ΔP : Pressure drop across sensor.

P_v : Liquid vapor pressure at operating temperature.

- 1) Using Pressure Drop Graph, from page 229, find ΔP by locating your maximum flow rate on specific sensor size line.
- 2) Using the Liquid Vapor Pressures Chart, find P_v at operating temperature.
- 3) Calculate minimum back pressure needed using formula.

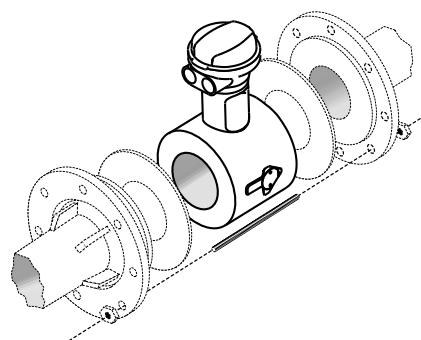
Installation of Flow Sensors: Vortex

IV. Flange Options for 7002 Large Diameter Vortex

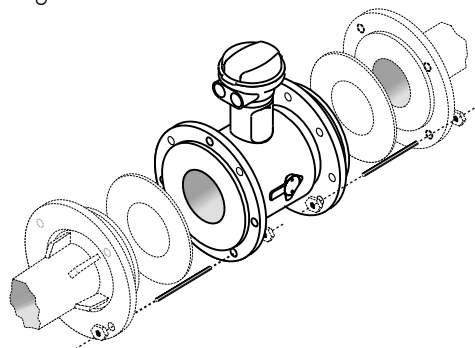
- Proper alignment of the sensor with gaskets and flanges is necessary to assure a uniform flow profile through the sensor.
- Space flanges in the piping system according to the length of the vortex flow sensor body.
- Observe torque recommendations.
- Mounting hardware, gaskets and piping system components (shown with broken lines in the diagrams below) are not furnished with the vortex flow sensors.

Sensor	Config.	# of Bolts	Bolt Diameter	Approximate Bolt Length	Required Torque
3" Flange	ISO	16	M16 (5/8" - 11)	70 mm (2.75")	40 ± 5 Nm (30 ± 4 lbf-ft)
3" Flange	ANSI	8	M16 (5/8" - 11)	70 mm (2.75")	40 ± 5 Nm (30 ± 4 lbf-ft)
4" Flange	ISO	16	M16 (5/8" - 11)	80 mm (3.00")	45 ± 5 Nm (33 ± 4 lbf-ft)
4" Flange	ANSI	16	M16 (5/8" - 11)	80 mm (3.00")	45 ± 5 Nm (33 ± 4 lbf-ft)
3" Wafer	ISO	8	M16 (5/8" - 11)	180 mm (7.50")	25 Nm (18.5 lbf-ft)
3" Wafer	ANSI	4	M16 (5/8" - 11)	180 mm (7.50")	25 Nm (18.5 lbf-ft)
4" Wafer	ISO	8	M16 (5/8" - 11)	220 mm (8.50")	30 Nm (22 lbf-ft)
4" Wafer	ANSI	8	M16 (5/8" - 11)	220 mm (8.50")	30 Nm (22 lbf-ft)

Wafer Vortex



Flange Vortex



- For wafer versions: If the application requires operation outside the range 15 to 35° C (59 to 95° F), then the accessory Spring Kit (3-7002.391) is necessary to relieve the forces due to thermal expansion of PVDF material and/or to prevent leakage during cooling. And if necessary, each bolt must be fitted with a die spring. The accessory spring kit contains four (4) springs, so two kits may be required. Check the table above to determine the number of bolts for your configuration. Bolt length approximations shown in the table above include sensor length, width dimensions for two each flange adapters, flange rings and gaskets, all typical of PVDF piping system components, plus nuts and washers. If the accessory Spring Kit will be used, bolt length requirements increase by 60 mm (2.5 inches.)
- For flange versions: Bolt length approximations shown in the table above include width dimensions for two flange adapters, two flange rings and a gasket, all typical of PVDF piping system components, plus nuts and washers.