

# Signet 2507 Mini Flow Sensor

English



3-2507.090

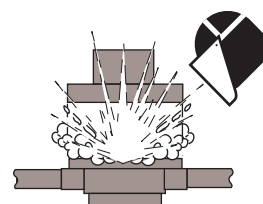
Rev. K 11/05

English

## WARNING! SAFETY INSTRUCTIONS



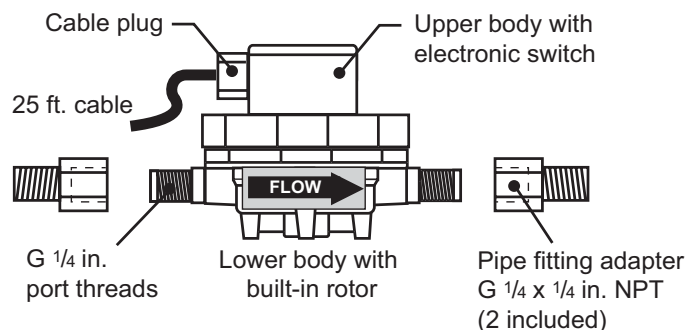
1. Do not remove from pressurized lines.
2. Confirm chemical compatibility before use.
3. Do not exceed maximum temperature/pressure specifications.
4. Wear safety goggles or faceshield during installation/service.
5. Do not alter product construction.
6. Failure to follow safety instructions could result in severe personal injury.



## 1. Description

The Signet 2507 Mini Flow Sensor contains a free-running rotor which is driven by the fluid flow. Within the given measurement range, the rotational speed of the rotor is proportional to the fluid flow rate. Permanent magnets built into the rotor actuate an electronic switch in the top of the sensor generating a square-wave output signal proportional to flow rate. Both opaque and transparent fluids can be measured from 0.2 to 20.0 centistokes.

Wetted sensor parts are constructed of PVDF and FPM, making the sensor suitable for use with most process fluids, including most acids, bases, light oils, and solvents.



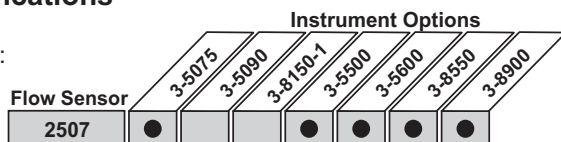
Polar organic solvents (i.e., ketones and chlorinated hydrocarbons) and aromatic hydrocarbons are not compatible with this sensor.

## WARNING!

## 2. Specifications

### General

Compatibility:



Flow Range:

- -2V sensor: 400 to 2800 mL/m (0.105 to 0.740 U.S. gpm)
- -3V sensor: 700 to 4200 mL/m (0.185 to 1.123 U.S. gpm)
- -4V sensor: 1300 to 6000 mL/m (0.343 to 1.585 U.S. gpm)
- -6V sensor: 3200 to 12000 mL/m (0.845 to 3.170 U.S. gpm)

Linearity:  $\pm 0.25\%$  of full range

Repeatability:  $\pm 0.25\%$  of full range

Viscosity range: 0.2 to 20.0 centistokes

Pipe connections: G 1/4 in. ports, 1/4 in. NPT (male) pipe adapters (2 included)

Cable length: Std: 7.6m (25 ft.), max.: 300 m (1000 ft.)

Cable type: 2-conductor shielded, twisted-pair, 22 AWG

Shipping Weight: 0.4 kg (0.8 lb.)

### Wetted Materials

- Housing: PVDF
- Flow insert: PTFE
- Quad ring seal: FPM
- Rotor: PVDF
- Pipe thread adapters: PVDF
- Suitable for clean fluids only

### Electrical

Power: 5 to 24 VDC @ 10 mA max.

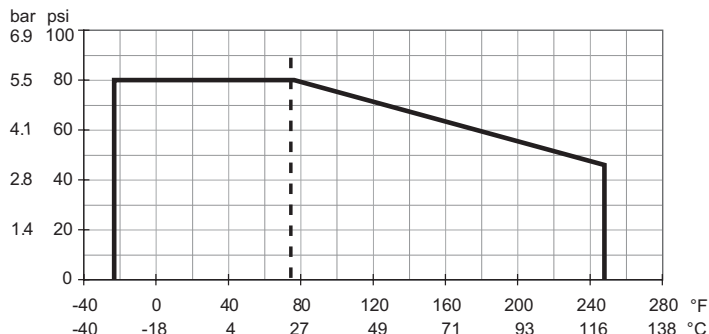
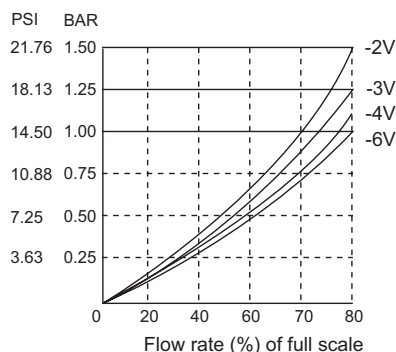
Output type: Open-collector transistor, 10 mA max. sink

### Max. pressure/temperature:

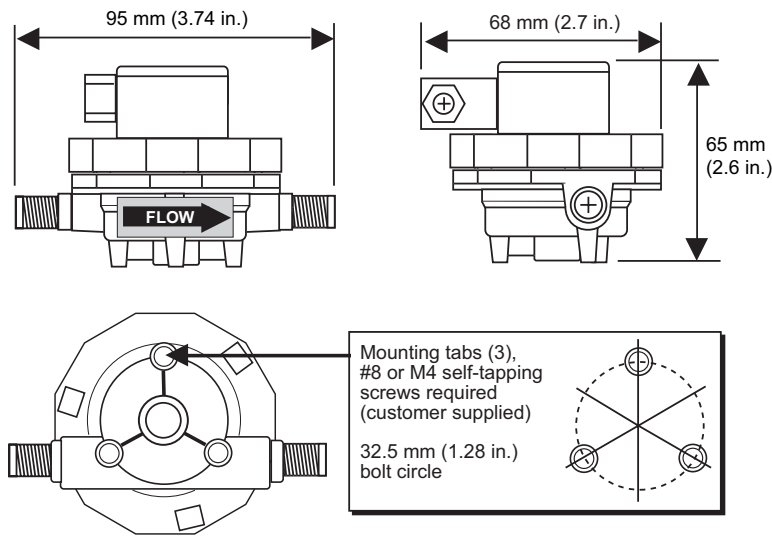
- 5.5 bar @ -30°C (80 psi @ -22°F)
- 5.5 bar @ 24°C (80 psi @ 75°F)
- 3 bar @ 120°C (45 psi @ 248°F)

### Pressure Drop:

Pressure Drop Across Sensor vs. Flow Rate

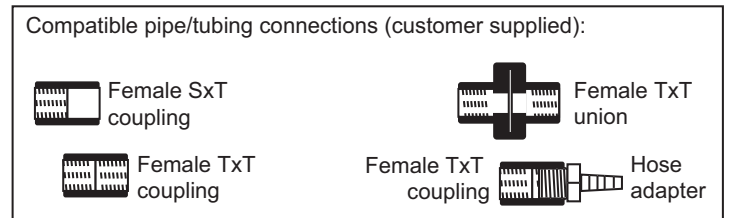
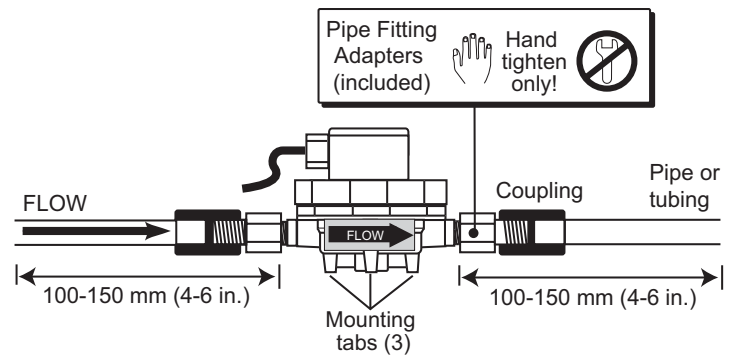


**Dimensions:**



**3. Installation**

- The sensor may be installed in any position, although horizontal flow is recommended (the sensor mounted upright). If the sensor is not installed upright, the linearity error may be greater in the lower part of the sensor's measurement range.
- Mounting tabs are provided using #8 or M4 self-tapping screws (customer supplied). See Dimensions illustration for mounting tab hole pattern specifications.
- Install sensor with the arrow pointing in the direction of flow.
- Always maximize distance between the sensor and pump source. Never install immediately downstream of valves, fittings, etc. For optimum performance, a straight flow run of at least 100 to 150 mm (4 to 6 in.) should be provided before and after the sensor.
- Two pipe fitting adapters (included) convert the G 1/4 in. straight threads to 1/4 in. NPT pipe threads. **Hand tighten only!** Apply 1-2 turns of sealing tape to all threaded connections to prevent leaks.



**CAUTION!** Use an adjustable wrench to prevent the fitting adapters from overtightening while installing mating pipe connectors. Sensor damage will occur if the ports are overtightened.

**Installation Hints**

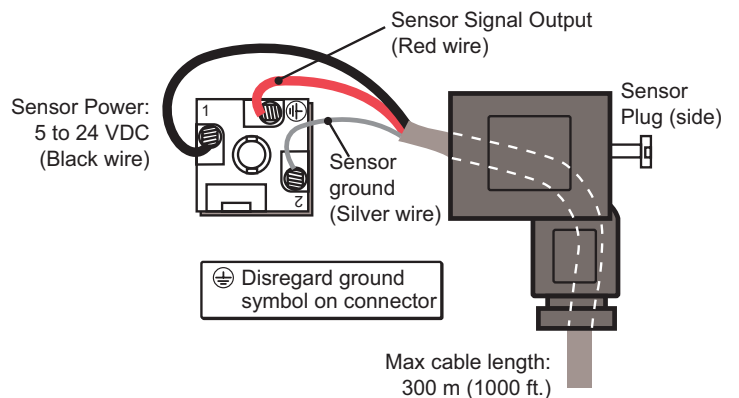
- Avoid vibrations and shocks
- Avoid solids in the fluid
- Install a filter or line strainer upstream to protect sensor

**4. Wiring Details**

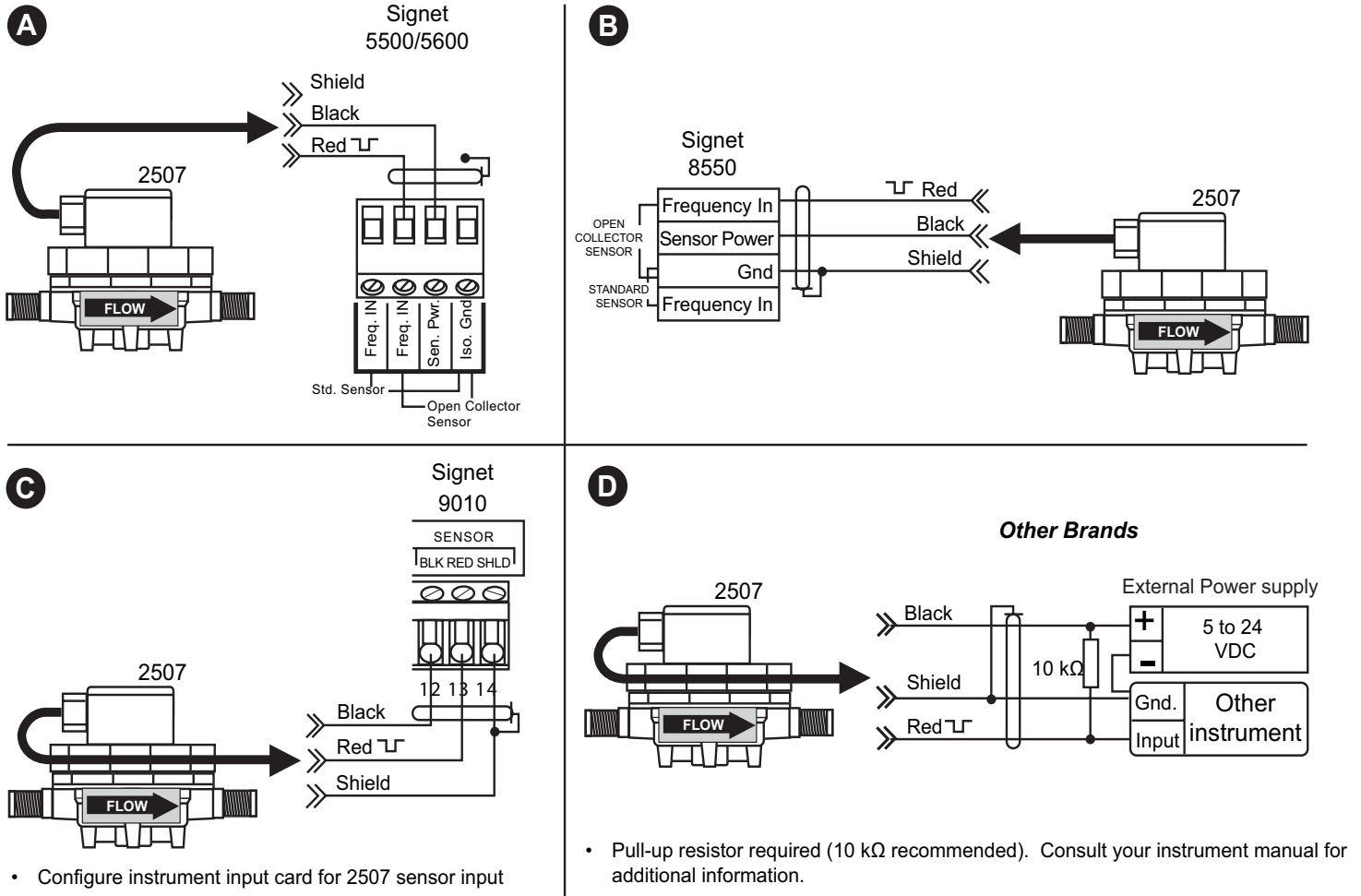
**4.1 Cable Extensions**

The standard 25 foot sensor cable can be extended to 300 m (1000 ft.) using 2-conductor **shielded twisted-pair** cable.

- Always maintain cable shield through cable splice.
- For splice-free cable replacement up to 300 m (1000 ft.), refer to the sensor plug connection diagram (below) for connection details.



## 4.2 Instrument Connections

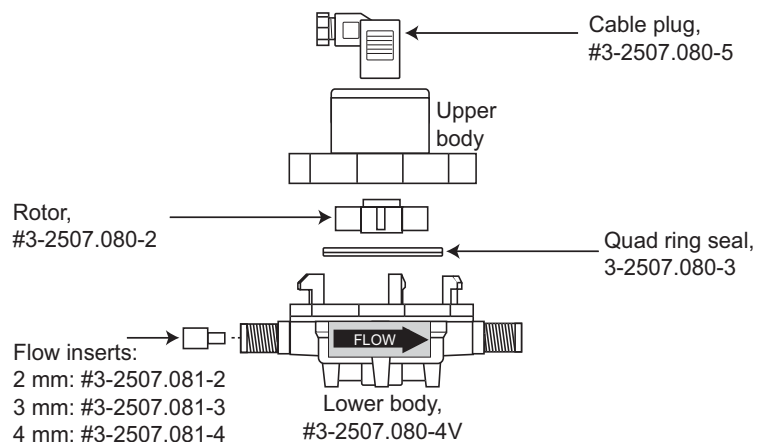


## 5. Calibration

The K-Factors listed below represent the number of pulses the sensor will generate for each measured engineering unit. They are listed in U.S. gallons, liters, and mL by sensor model.

Sensor Model	Flow Insert	K-FACTORS		
		Pulses per U.S.GAL	Pulses per LITER	Pulses per mL
3-2507.100-2v	2mm	5685	1502	1.502
3-2507.100-3v	3mm	3308	874	0.874
3-2507.100-4v	4mm	2316	612	0.612
3-2507.100-6v	NONE	1249	330	0.33

## 6. Replacement Parts



## 7. Replacing The Flow Insert

Sensor range can be modified by changing the flow insert. The sensor must be removed from service and disassembled prior to installing the new flow insert. See section 2 specifications for flow range data.

Flow Insert Replacement Procedure:

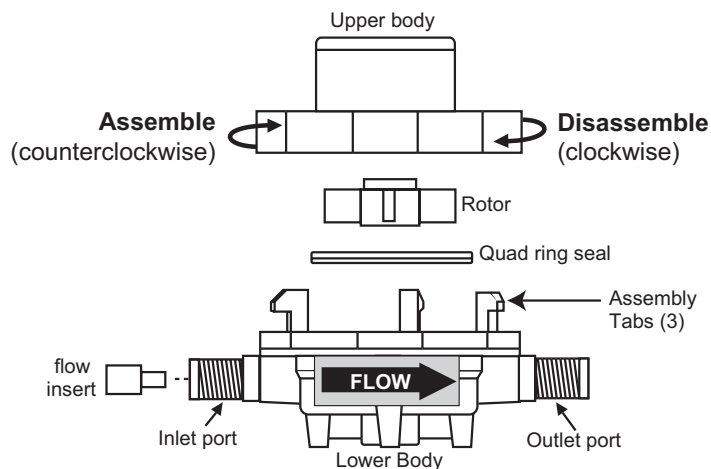
1. Depressurize system and remove sensor.
2. Rotate the upper sensor body clockwise until it releases from the lower half, then lift off.
3. Remove rotor and quad ring seal from lower body.
4. Push the flow insert outward using a small screwdriver.
5. Install the new flow insert (small diameter inward) with the eraser end of a pencil. Apply light pressure until insert seats against the step in the lower body. **Do not force!**
6. Install rotor into lower body. Spin rotor with finger and check for free rotation. If rotor hits flow insert, remove rotor and push insert back until free rotor rotation is established. Use a rounded object like a pen or pencil body to adjust flow insert depth.
7. Install rotor, quad ring, and upper body. **Hand tighten only!** Do not overtighten upper body or the lower body assembly tabs will break.

8. Reprogram instrument with new K-Factor, see calibration section 5.



### WARNING!

Do not use tools of any kind on the sensor body or port connections. Hand tighten only! Excessive force will damage sensor.



## 8. Troubleshooting

Condition	Recommendation
Erratic or missing sensor signal	<p>A) Verify ALL cable and instrument connections (section 4).</p> <p>B) Verify proper sensor installation (section 3).</p> <p>C) Remove power from instrument and disconnect sensor inputs. Power up instrument and check across Black and Shield terminals with a digital voltage meter for 5 VDC. If 5 VDC is not present, the problem is in the instrument or the wiring.</p> <p>D) Verify the 2507 paddlewheel is spinning freely by blowing into the flow chamber. If the paddlewheel doesn't spin freely, the following conditions may exist:</p> <ul style="list-style-type: none"> <li>• The sensor may be dirty or clogged. Disassemble and clean with hot tap water and soft brush (see section 7).</li> <li>• The rotor may be hitting the flow insert. Disassemble and adjust flow insert depth (see section 7).</li> </ul> <p>E) Test sensor with flow system active and sensor powered. Use an oscilloscope to check the sensor input signal across the Red (Signal IN) and Shield terminals. A square wave signal should appear at these terminals. If no signal is present replace sensor.</p>
Perform steps A-E If sensor problems persist, contact your local Signet dealer	

## 9. Ordering Information

Mfr. Part No.	Code	Description
3-2507.100-2V	198 801 732	Mini-Flow Sensor, 2mm insert
3-2507.100-3V	198 801 733	Mini-Flow Sensor, 3mm insert
3-2507.100-4V	198 801 734	Mini-Flow Sensor, 4mm insert
3-2507.100-6V	198 801 736	Mini-Flow Sensor, 6mm inlet, no insert

### Accessories

Mfr. Part No.	Code	Description
3-2507.080-2	159 000 254	Rotor, 2507
3-2507.080-3	159 000 255	Quad Ring, 2507
3-2507.080-5	159 000 256	DIN Connector, 2507
3-2507.081-2	198 801 502	2 mm Insert
3-2507.081-3	198 801 503	3 mm Insert
3-2507.081-4	198 801 558	4 mm Insert
5523-0222	159 000 392	Cable, per foot



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