

# Signet 2540 Stainless Steel High Performance Paddlewheel Flow Sensor



Standard Sensor



Hot-Tap Sensor

The Signet 2540 Paddlewheel Flow Sensor offers the strength and corrosion resistance of stainless steel for liquid applications with low velocity measurements. Unique internal circuitry eliminates the need for magnets in the process fluid, enabling flow measurement of 0.1 to 6 m/s (0.3 to 20 ft/s) while maintaining the advantages of insertion sensor design. Ultraflon 500C bearings and Tungsten Carbide pin provide exceptional wear resistance.

The Signet 2540 offers field replaceable electronics and transient voltage suppression (TVS) to provide greater immunity to large voltage disturbances (i.e. lightning) sometimes encountered in field wiring. Sensors can be installed in DN40 to DN600 (1½ to 24 inch) pipes using the 1½ inch or ISO 7/1-R 1.5 threaded process connection.

The sensors are also offered in a hot-tap configuration with a bleed valve service without process shutdown in pipes up to DN900 (36 in.). Both styles of sensors must be used in full pipes and can be used in low pressure systems.

## Features

- Operating range 0.1 to 6 m/s (0.3 to 20 ft/s)
- Field replaceable electronics
- Non-magnetic RF detection
- Standard NPT or ISO process connections
- Hot-tap versions for installation/service without system shutdown
- For pipe sizes up to DN900 (36 in.)
- Adjustable sensor - one size for entire pipe range
- 7.6 m (25 ft) cable



## Applications

- HVAC
- Turf Irrigation
- Cooling Systems
- Filtration Systems
- Water Distribution
- Leak Detection
- Pump Protection
- Clarified Effluent Totalization
- Ground Water Remediation
- Gravity Feed Line

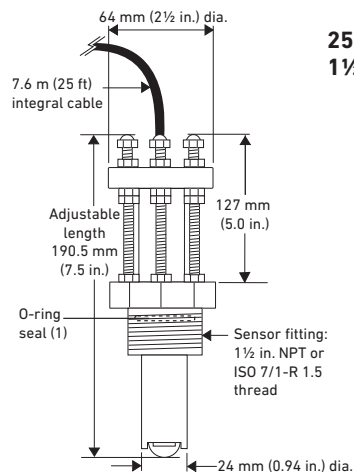
# Specifications

| General   |   |                        |              |
|---|---|------------------------|--------------|
| Operating Range   | 0.1 to 6 m/s  | 0.3 to 20 ft/s         |              |
| Pipe Size Range   | Standard Version  | DN40 to DN600          | 1½ to 24 in. |
|   | Hot-Tap Version   | DN40 to DN900          | 1½ to 36 in. |
| Sensor Fitting Options                                  | 1½ in. NPT threads  | ISO 7/1-R 1.5 threads  |              |
| Linearity   | ±1% of full range   |                        |              |
| Repeatability   | ±0.5% of full range   |                        |              |
| Min. Reynolds Number Required                           | 4500  |                        |              |
| Wetted Materials  |   |                        |              |
| Body  | 316 stainless steel (1.4401)  |                        |              |
| Fitting   | 316 stainless steel (1.4401)  |                        |              |
| Fitting O-rings   | FKM, optional EPDM (EPDM)   |                        |              |
| Rotor   | 17-4PH-1 Stainless Steel  |                        |              |
| Rotor Pin   | Tungsten Carbide GRP 1 (standard) stainless steel (optional)  |                        |              |
| Retainers (2)   | 316 stainless steel (1.4401)  |                        |              |
| Rotor Bearings (2)                                      | Carbon fiber reinforced PTFE  |                        |              |
| Electrical  |   |                        |              |
| Frequency   | 49 Hz per m/s nominal   | 15 Hz per ft/s nominal |              |
| Power   | 5 to 24 VDC ±10%, regulated, 1.5 mA max.  |                        |              |
| Output Type   | Open collector, sinking, max 10.0 mA  |                        |              |
| Cable Length  | 7.6 m (25 ft), can be extended up to 300 m (1,000 ft)   |                        |              |
| Cable Type  | 2-conductor twisted-pair with shield, 22 AWG  |                        |              |
| Max. Temperature/Pressure Rating                        |   |                        |              |
| Sensor with standard FKM sensor fitting O-rings         | 17 bar @ 82 °C  | 250 psi @ 180 °F       |              |
| Sensor with optional EPDM (EPDM) sensor fitting O-rings | 17 bar @ 100 °C   | 250 psi @ 212 °F       |              |
| Operating Temperature                                   | -18 °C to 100 °C  | 0 °F to 212 °F         |              |
| Shipping Weight   |   |                        |              |
|   | 3-2540-1/-2/-1S/-2S   | 1.79 kg                | 3.9 lb       |
|   | 3-2540-3/-4/-3S/-4S   | 2.15 kg                | 4.7 lb       |
| Standards and Approvals                                 |   |                        |              |
|   | CE, FCC   |                        |              |
|   | RoHS compliant, China RoHS  |                        |              |
|   | Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety |                        |              |

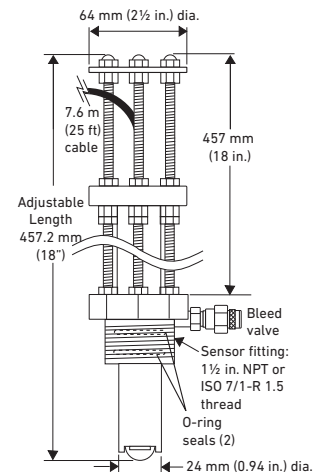
See Temperature and Pressure graphs for more information.

## Dimensions

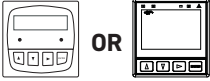
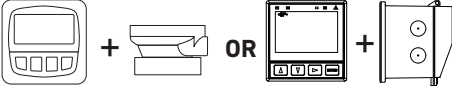
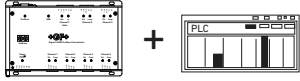


### 2540 High Performance Flow Sensor for 1½ to 24 in. pipes



### 2540 Hot-Tap for 1½ to 36 in. pipes



# System Overview

| Panel Mount   | Pipe, Tank, Wall Mount   | Automation System   |
|---|--|---|
| Signet Instruments<br>8900    9900<br>9900-1BC    9950  | Signet Instruments<br>9900-1P    9900-1BC with Rear Enclosure<br>9950              | 0486 Profibus Concentrator<br>and Customer Supplied<br>Programmable Logic Controller or<br>Programmable Automation Controller |
|    |  |    |
| Signet 2540 Standard or<br>Hot-tap (not shown)<br>Flow Sensor  |  |   |
| All sold separately   |  |   |
| Fittings -<br>Customer supplied   |   |   |

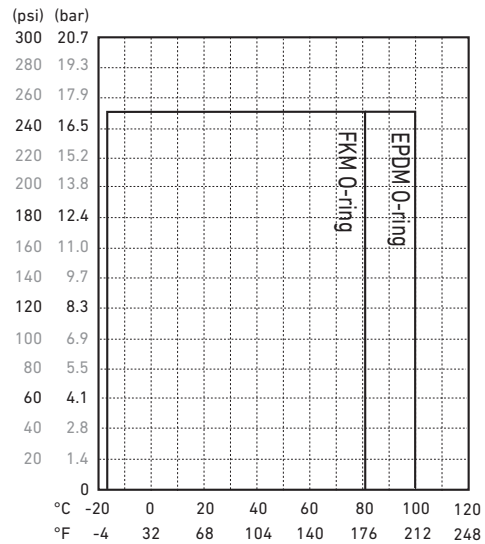
## Application Tips

- For systems with components of more than one material, the maximum temperature/pressure specification must always be referenced to the component with the lowest rating.
- Use the Conduit Adapter Kit to protect the cable-to-sensor connection when used in outdoor environments.
- Sensor electronics can be easily replaced by 3-2541.260-1 or 3-2541.260-2.

## Temperature/Pressure Graphs

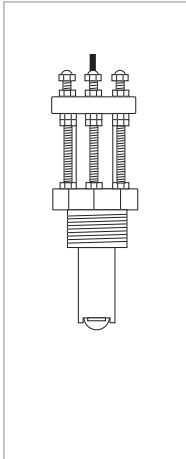
### Note:

The pressure/temperature graphs are specifically for the Signet sensor. During system design the specifications of all components must be considered. In the case of a metal piping system, a plastic sensor will reduce the system specification. When using a PVDF sensor in a PVC piping system, the fitting will reduce the system specification.



Please refer to Wiring, Installation, and Accessories sections for more information.

## Ordering Information



| Mfr. Part No.   | Code               | Mounting Option                     | Rotor Pin Material  |
|---|--------------------|-------------------------------------|---------------------|
| Stainless Steel High Performance flow sensor with removable electronics |                    |                                     |                     |
| 3-2540-1  | <b>198 840 035</b> | 1½ inch NPT thread                  | Tungsten Carbide    |
| 3-2540-2  | <b>198 840 036</b> | 1½ inch ISO thread                  | Tungsten Carbide    |
| 3-2540-3  | <b>198 840 037</b> | 1½ inch NPT thread, Hot-Tap design* | Tungsten Carbide    |
| 3-2540-4  | <b>198 840 038</b> | 1½ inch ISO thread, Hot-Tap design* | Tungsten Carbide    |
| 3-2540-1S   | <b>159 001 501</b> | 1½ inch NPT thread                  | 316 Stainless Steel |
| 3-2540-2S   | <b>159 001 502</b> | 1½ inch ISO thread                  | 316 Stainless Steel |
| 3-2540-3S   | <b>159 001 503</b> | 1½ inch NPT thread, Hot-Tap design* | 316 Stainless Steel |
| 3-2540-4S   | <b>159 001 504</b> | 1½ inch ISO thread, Hot-Tap design* | 316 Stainless Steel |

\*Must use 3-1500.663 Hot-Tap installation tool (ordered separately)

### Ordering Notes

Installation fittings and Hot-Tap valves are customer supplied.

## Accessories and Replacement Parts

| Mfr. Part No. | Code               | Description  |
|---------------|--------------------|--|
| 3-1500.663    | <b>198 820 008</b> | Hot-Tap Installation Tool (see Installation for more info)               |
| 1220-0021     | <b>198 801 000</b> | O-ring, FKM (2 required per sensor)                                      |
| 1224-0021     | <b>198 820 006</b> | O-ring, EPR (EPDM) (2 required per sensor)                               |
| 1228-0021     | <b>198 820 007</b> | O-ring, FFKM (2 required per sensor)                                     |
| 3-2540.320    | <b>198 820 040</b> | Rotor kit, 2540 PEEK® Bearing (old version)                              |
| 3-2540.321    | <b>159 000 623</b> | Rotor kit, 2540 Tungsten Carbide Pin (new version since January 1, 2000) |
| 3-2540.322    | <b>159 000 864</b> | Rotor kit, stainless steel pin and rotor                                 |
| P52504-3      | <b>159 000 866</b> | Rotor pin, Tungsten Carbide  |
| P52504-4      | <b>159 000 867</b> | Rotor pin, 316 SS  |
| P52503        | <b>198 820 013</b> | Bearing, carbon reinforced PTFE  |
| P52527        | <b>159 000 481</b> | Retainers, SS (1.4401)   |
| 3-2541.260-1  | <b>159 000 849</b> | Standard replacement electronics module                                  |
| 3-2541.260-2  | <b>159 000 850</b> | Hot-Tap replacement electronics module                                   |
| 5523-0222     | <b>159 000 392</b> | Cable (per foot), 2 cond. w/shield, 22 AWG                               |
| P51589        | <b>159 000 476</b> | Conduit adapter kit  |
| P31934        | <b>159 000 466</b> | Conduit cap  |

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