Signet 515 Rotor-X Paddlewheel Flow Sensors

Standard Sensor (with red cap)

Integral Sensor

Wet-Tap Sensor

Simple to install with time-honored reliable performance, Signet 515 Rotor-X Paddlewheel Flow Sensors are highly repeatable, rugged sensors that offer exceptional value with little or no maintenance. The output signal of the Model 515 is a sinusoidal frequency capable of driving a self-powered flowmeter (Model 3-5090). The wide dynamic flow range of 0.3 to 6 m/s (1 to 20 ft/s) allows the sensor to measure liquid flow rates in full pipes and can be used in low pressure systems.

The Model 515 sensors are offered in a variety of materials for a wide range of pipe sizes and insertion configurations. The many material choices including PP and PVDF make this model highly versatile and chemically compatible to many liquid process solutions. Sensors can be installed in up to DN900 (36 in.) pipes using Signet's comprehensive line of custom fittings. These custom fittings, which include tees, saddles, and weldolets, seat the sensor to the proper insertion depth into the process flow. The sensors are also offered in configurations for wet-tap installation requirements.

Features

- **Operating range 0.3 to 6 m/s (1 to 20 ft/s)**
- **Wide turndown ratio of 20:1**
- **Highly repeatable output**
- **Simple, economical design**
- **Installs into pipe sizes DN15 to DN900 (½ to 36 in.)**
- **Self-powered/no external power required**
- **Test certificate included for -X0, -X1**
- **Chemically resistant materials**

Applications

- **Pure Water Production**
- **Filtration Systems**
- **Chemical Production**
- **Liquid Delivery Systems**
- **Pump Protection**
- **Scrubber Systems**
- **Water Monitoring**
- **Not suitable for gases**

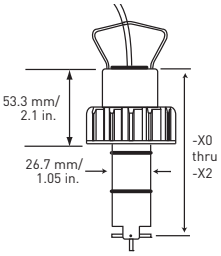
Specifications

General			
Operating Range		0.3 to 6 m/s	1 to 20 ft/s
Pipe Size Range		DN15 to DN900	½ to 36 in.
Linearity		±1% of max. range @ 25 °C (77 °F)	
Repeatability		±0.5% of max. range @ 25 °C (77 °F)	
Min. Reynolds Number Required		4500	
Wetted Materials			
Sensor Body		Glass-filled PP (black) or PVDF (natural)	
O-rings		FPM (std), optional EPR (EPDM) or FFPM	
Rotor Pin		Titanium, Hastelloy-C or PVDF; optional Ceramic, Tantalum, or Stainless Steel	
Rotor		Black PVDF or Natural PVDF; optional ETFE, with or without carbon fiber reinforced PTFE sleeve	
Electrical			
Frequency		19.7 Hz per m/s nominal	6 Hz per ft/s sinusoidal
Amplitude		3.3 V p/p per m/s nominal	1 V p/p per ft/s
Source Impedance		8 KΩ	
Cable Type		2-conductor twisted pair with shield, 22 AWG	
Cable Length		7.6 m (25 ft) can be extended up to 60 m (200 ft) maximum	
Max. Temperature/Pressure Rating - Standard and Integral Sensor			
	PP	12.5 bar @ 20 °C	181 psi @ 68 °F
		1.7 bar @ 90 °C	25 psi @ 194 °F
	PVDF	14 bar @ 20 °C	203 psi @ 68 °F
		1.4 bar @ 100 °C	20 psi @ 212 °F
Operating Temperature			
	PP	-18 °C to 90 °C	0°F to 194 °F
	PVDF	-18 °C to 100 °C	0 °F to 212 °F
Max. Temperature/Pressure Rating - Wet-Tap Sensor			
	PP	7 bar @ 20 °C	102 psi @ 68 °F
		1.4 bar @ 66 °C	20 psi @ 150 °F
Operating Temperature			
		-18 °C to 66 °C	0 °F to 150 °F
Max. Wet-Tap Sensor Removal Rating			
		1.7 bar @ 22 °C	25 psi @ 72 °F
Shipping Weight			
	P51530-X0	0.454 kg	1.00 lb
	P51530-X1	0.476 kg	1.05 lb
	P51530-X2	0.680 kg	1.50 lb
	P51530-X3	0.780 kg	1.72 lb
	P51530-X4	0.800 kg	1.76 lb
	P51530-X5	0.880 kg	1.94 lb
	3-8510-X0	0.23 kg	0.50 lb
	3-8510-X1	0.23 kg	0.50 lb
Standards and Approvals			
		RoHS compliant, China RoHS	
		Lloyd's Register, NSF	
		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

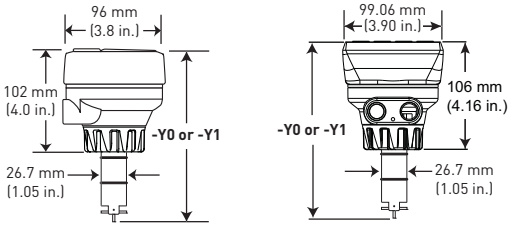
Dimensions

Standard Mount



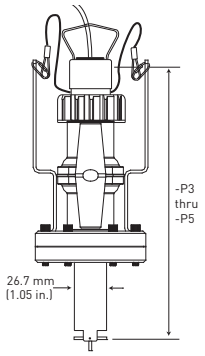
Pipe range	
0.5 to 4 in.	-X0 = 104 mm (4.1 in.)
5 to 8 in.	-X1 = 137 mm (5.4 in.)
10 in. and up	-X2 = 213 mm (8.4 in.)

Integral Mount
(shown with Transmitter sold separately)



Pipe range	
0.5 to 4 in.	-Y0 = 152 mm (6.0 in.)
5 to 8 in.	-Y1 = 185 mm (7.3 in.)

Wet-Tap Mount Sensor with 3519 Wet-Tap Valve
(See 3519 product page for more information).



Pipe range	
0.5 to 4 in.	-P3 = 297 mm (11.7 in.)
5 to 8 in.	-P4 = 333 mm (13.1 in.)
10 in. and up	-P5 = 409 mm (16.1 in.)

System Overview

Panel Mount	Field Mount - Pipe, Tank, Wall	Integral Mount
Signet Instruments 5090 8150 8550 8900 9900 9900-1BC	Signet Instruments 8150 8550 9900 with 3-8050 Universal Mount Kit	Signet Instruments 8150 8550 9900 with 3-8051-X Integral Mount Kit

Signet 515 Standard or Wet-Tap Flow Sensor

Signet 8510 Integral Mount Flow Sensor

Signet Fittings

All sold separately

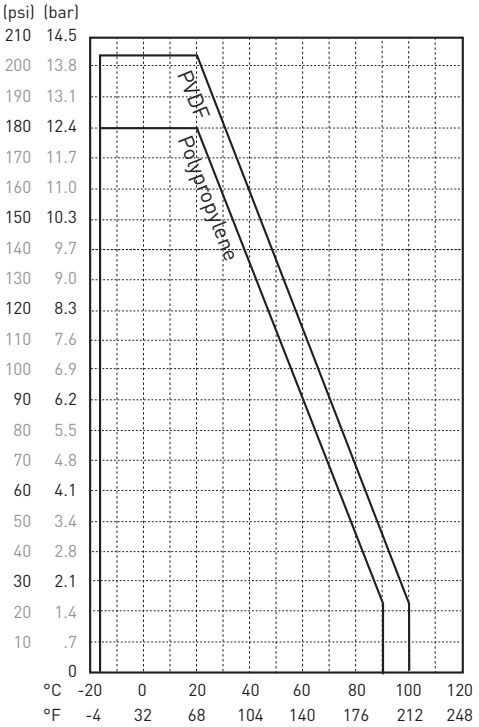
For overview of Wet-Tap System, see 3519 product page

Application Tips

- Use the Conduit Adapter Kit to protect the cable-to-sensor connection when used in outdoor environments. See Accessories section for more information.
- Use a sleeved rotor in abrasive liquids to reduce wear.
- Sensor plug can be used to plug installation fitting after extraction of sensor from pipe.
- For liquids containing ferrous particles, use Signet Magmeters.
- 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.

Operating 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.



Ordering Notes

1) Most common part number combinations shown. For all other combinations contact factory.

2) Other rotor and pin materials are available for purchase from the factory and can be easily replaced in the field. See Accessories section.

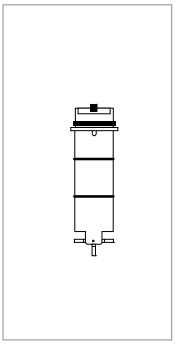
Ordering Information

Model 515 Standard Mount Paddlewheel
When choosing this style of sensor, the instrument can be mounted nearby on a pipe or wall or in a remote location up to 61 m (200 ft) by connecting the sensor through a standard 3-8050-1 universal junction box. Standard cable length is 7.6 m (25 ft). Use Signet fittings for proper seating of the sensor into the process flow.

Mfr. Part No.	Code	Body	Rotor	Pin Material
Paddlewheel Flow Sensor for use with remote mount instrument				
Pipe size DN15 to DN100 - ½ to 4 in.				
P51530-H0	**198 801 659**	Polypropylene	Black PVDF	Hastelloy-C
P51530-P0	**198 801 620**	Polypropylene	Black PVDF	Titanium
P51530-S0	**198 801 661**	Polypropylene	Black PVDF	Natural PVDF
P51530-T0	**198 801 663**	Natural PVDF	Natural PVDF	Natural PVDF
P51530-V0	**198 801 623**	Natural PVDF	Natural PVDF	Hastelloy-C
Pipe size DN125 to DN200 - 5 to 8 in.				
P51530-P1	**198 801 621**	Polypropylene	Black PVDF	Titanium
P51530-T1	**198 801 664**	Natural PVDF	Natural PVDF	Natural PVDF
P51530-V1	**198 801 624**	Natural PVDF	Natural PVDF	Hastelloy-C
Pipe size DN250 - DN900 - 10 to 36 in.				
P51530-P2	**198 801 622**	Polypropylene	Black PVDF	Titanium
P51530-V2	**198 801 625**	Natural PVDF	Natural PVDF	Hastelloy-C

Ordering Information (continued)

Model 515 Integral Mount Paddlewheel
When choosing this style of sensor, the instrument is mounted directly onto the sensor for a local display. See guideline below for instructions.



Mfr. Part No.	Code	Body	Rotor	Pin Material
Flow sensor for integral mounting on the 8150, 8550 or 9900 instrument using the 3-8051-X flow sensor integral mounting kit (sold separately)				
DN15 to DN100 - ½ to 4 in.				
3-8510-P0	**198 864 504**	Polypropylene	Black PVDF	Titanium
3-8510-T0	**159 000 622**	Natural PVDF **	Natural PVDF	Natural PVDF
3-8510-V0	**198 864 506**	Natural PVDF **	Natural PVDF	Hastelloy-C
DN125 to DN200 - 5 to 8 in.				
3-8510-P1	**198 864 505**	Polypropylene	Black PVDF	Titanium

**PVDF available ½ in. to 4 in. only

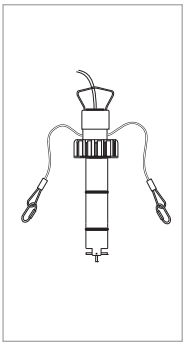
Combining a 515 Integral mount flow sensor with an integrally mounted instrument

Option 1
Once an integral mount sensor is chosen, it can be mounted directly to a field mount transmitter by following these guidelines:

a) Order the 3-8051-X flow sensor integral mounting kit (sold separately) to connect the sensor to an instrument.
b) Order a field mount transmitter (sold separately). The following part numbers are compatible: 3-8550-3, 3-8150-1, 3-9900-1.
c) Assembling the sensor with the integral adapter and instrument is quick and simple.

Option 2
These parts can also be ordered as an assembled part.
See page 146 "Integral Mount" for more information.

Model 515 Wet-Tap Mount Paddlewheel Flow Sensor
When choosing this style of sensor, the instrument can be mounted nearby on a pipe or wall or in a remote location up to 61 m (200 ft) by connecting the sensor through a standard 3-8050-1 universal junction box. Standard cable length is 7.6 m (25 ft). This style of sensor uses the 3519 Wet-Tap valve only (see individual product page for more information).



Mfr. Part No.	Code	Body	Rotor	Pin Material
Flow Sensor for wet-tap mounting with the 3519 Wet-Tap Valve (sold separately)				
DN15 to DN100 - ½ to 4 in.				
P51530-P3	**198 840 310**	Polypropylene	Black PVDF	Titanium
DN125 to DN200 - 5 to 8 in.				
P51530-P4	**198 840 311**	Polypropylene	Black PVDF	Titanium
DN250 to DN900 - 10 to 36 in.				
P51530-P5	**198 840 312**	Polypropylene	Black PVDF	Titanium

Combining a 515 Wet-Tap Sensor with a 3519 Wet-Tap Valve

a) Sensor can be mounted in a 3519 Wet-Tap Valve (sold separately)
b) Assembling a sensor with a 3519 Wet-Tap valve is quick and simple. These parts can also be ordered as complete assemblies. See 3519 product page.

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

Accessories and Replacement Parts

Mfr. Part No.	Code	Description
M1538-2	**198 801 181**	Rotor, PVDF Black
M1538-4	**198 820 018**	Rotor, ETFE
P51547-3	**159 000 474**	Rotor, PVDF Natural
3-0515.322-1	**198 820 059**	Sleeved rotor, PVDF Black
3-0515.322-2	**198 820 060**	Sleeved rotor, PVDF Natural
3-0515.322-3	**198 820 017**	Sleeved rotor, ETFE
Rotor Pins		
M1546-1	**198 801 182**	Pin, Titanium
M1546-2	**198 801 183**	Pin, Hastelloy-C
M1546-3	**198 820 014**	Pin, Tantalum
M1546-4	**198 820 015**	Pin, Stainless Steel
P51545	**198 820 016**	Pin, Ceramic
O-Rings		
1220-0021	**198 801 000**	O-ring, FPM (2 required per sensor)
1224-0021	**198 820 006**	O-ring, EPR (EPDM) (2 required per sensor)
1228-0021	**198 820 007**	O-ring, FFPM (2 required per sensor)
Miscellaneous		
P31536	**198 840 201**	Sensor plug, Polypropylene
P31542	**198 801 630**	Sensor cap, Red
P31934	**159 000 466**	Conduit cap
P51550-3	**198 820 043**	PVDF natural, Rotor kit
P51589	**159 000 476**	Conduit adapter kit
5523-0222	**159 000 392**	Cable (per foot), 2 cond. w/shield, 22 AWG
3-8050	**159 000 184**	Universal mounting kit
3-8051-1	**159 001 755**	Transmitter integral mounting kit, NPT, PP (for use with 8510 and 8512)
3-8051-2	**159 001 756**	Transmitter integral mounting kit, NPT, PVDF (for use with 8510 and 8512)
3-8050.390-1	**159 001 702**	Retaining nut replacement kit, NPT, Valox
3-8050.390-3	**159 310 116**	Retaining nut replacement kit, NPT, PP
3-8050.390-4	**159 310 117**	Retaining nut replacement kit, NPT, PVDF
3-8051	**159 000 187**	Transmitter integral mount kit (for use with 8510 and 8512)
3-8050-1	**159 000 753**	Universal mount junction box

3-0515.099 Rev K (2/15)

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