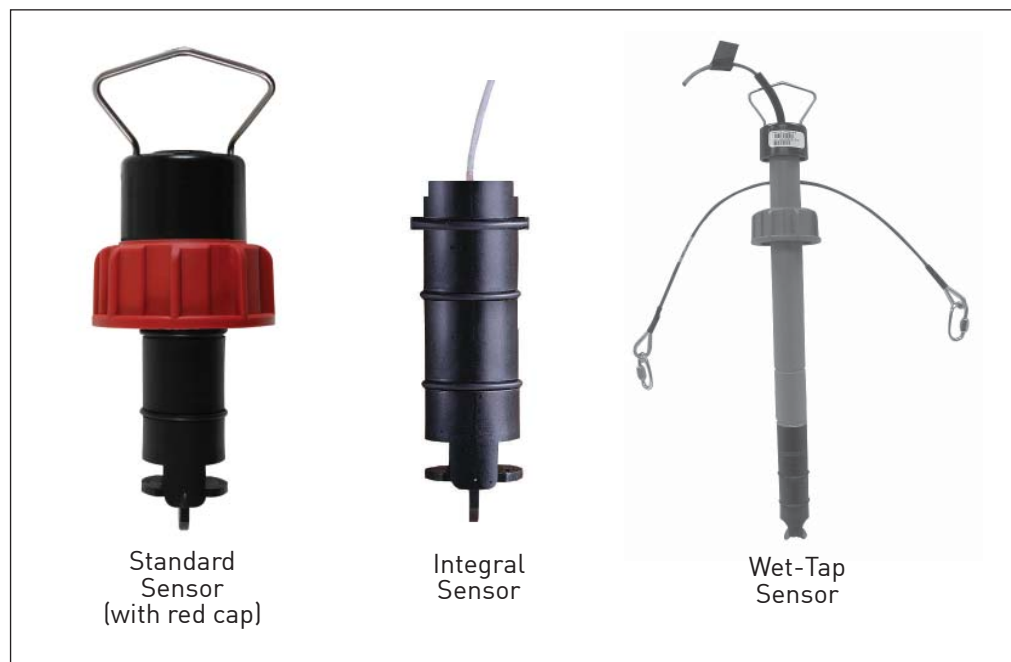


# Signet 515 Rotor-X Paddlewheel Flow Sensors



Standard Sensor  
(with red cap)

Integral Sensor

Wet-Tap Sensor

## 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

## Description







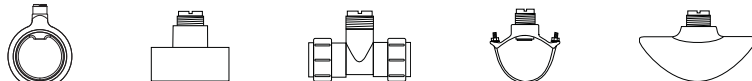
Simple to install with time-honored reliable performance, Signet 515 Rotor-X Paddlewheel Flow Sensors are highly repeatable, rugged sensors that offer exceptional value with little or no maintenance. The output signal of the Model 515 is a sinusoidal frequency capable of driving a self-powered flowmeter (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 and intrinsically safe installation requirements.

## Applications

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

## System Overview (For overview of Wet-Tap System, see 3519 product page)

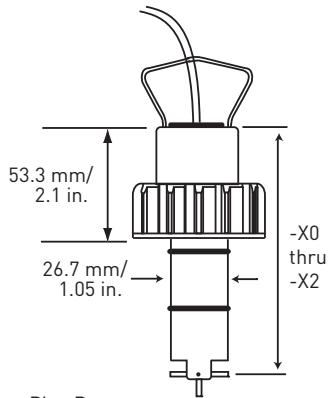
<p><b>Panel Mount</b> Signet Flow Instrument (sold separately) 5075 8150 5090 8550 5500 8900 5600</p> 	<p><b>Pipe, Tank, Wall Mount</b> Signet Flow Instrument (sold separately) 8150 8550</p> 	<p><b>Integral Mount</b> Signet Flow Instrument (sold separately) 8150 8550</p> 
<p><b>Signet Model 515 Standard or Wet-Tap (not shown) Flow Sensor</b></p> 	<p><b>Signet Model 515 Standard or Wet-Tap (not shown) Flow Sensor</b></p> 	<p><b>Signet Model 515 Integral Mount Flow Sensor</b></p> 
<p>Signet Fittings* (sold separately)</p> 		



\* See Fittings section for more information.

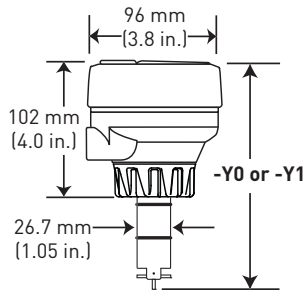
## Dimensions

### 515 Standard Mount Sensor



Pipe Range  
 ½ 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.)

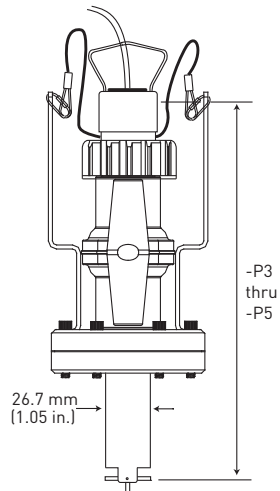
### 515 Integral Mount Sensor shown with Transmitter (sold separately)



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

### 515 Wet-Tap Mount Sensor with 3519 Wet-Tap Valve

See more information on the 3519 Wet-Tap Valve, refer to the 3519 product page.



Pipe Range  
 ½ 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.)

## 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 Tefzel®, with or without Fluoroloy G® 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,  
 1.7 bar @ 90 °C  
 (180 psi @ 68 °F, 25 psi @ 194 °F)
  - PVDF: 14 bar @ 20 °C,  
 1.4 bar @ 100 °C  
 (200 psi @ 68 °F, 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)

### Wet-Tap Sensor

- PP: 7 bar @ 20 °C, 1.4 bar @ 66 °C  
 (100 psi @ 68 °F, 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)

See Temperature and Pressure Graphs for more information.

### Shipping Weight

P51530-X0	0.454 kg	1.00 lb
P51530-X1	0.476 kg	1.04 lb
P51530-X2	0.680 kg	1.50 lb
P51530-X3	0.794 kg	1.75 lb
P51530-X4	0.850 kg	1.87 lb
P51530-X5	1 kg	2.20 lb
3-8510-X0	0.23 kg	.50 lb
3-8510-X1	0.23 kg	.50 lb

### Standards and Approvals

- FM Class I, II, III/Div. 1/groups A-G
- RoHS compliant
- Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management

### 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.

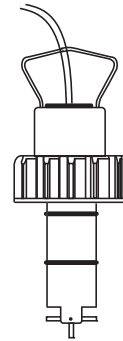
Please refer to Wiring, Installation, Accessories and Fittings sections for more information.

## 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 60 m/200 ft (standard cable length is 7.6 m/25 ft) by connecting the sensor through a standard 3-8050-1 universal junction box. Use Signet fittings for proper seating of the sensor into the process flow.

Model 515 Standard Paddlewheel Flow Sensor



Sensor Part Number	
<b>P51530</b>	Flow Sensor for use with remote mount instrument
↓	Body/Rotor/Pin Material-Choose One*
	- H Polypropylene/Black PVDF/Hastelloy-C
	- P Polypropylene/Black PVDF/Titanium
	- S Polypropylene/Black PVDF/Natural PVDF
	- T Natural PVDF/Natural PVDF/Natural PVDF
	- V Natural PVDF/Natural PVDF/Hastelloy-C
	Pipe Size - Choose One
0	½ to 4 in.
1	5 to 8 in.
2	10 to 36 in.
↓	
<b>P51530</b>	<b>- P 0 Example Part Number</b>

Mfr. Part No.*	Code	Mfr. Part No.*	Code
P51530-H0	<b>198 801 659</b>	P51530-T0	<b>198 801 663</b>
P51530-P0	<b>198 801 620</b>	P51530-T1	<b>198 801 664</b>
P51530-P1	<b>198 801 621</b>	P51530-V0	<b>198 801 623</b>
P51530-P2	<b>198 801 622</b>	P51530-V1	<b>198 801 624</b>
P51530-S0	<b>198 801 661</b>	P51530-V2	<b>198 801 625</b>

### \*Model 515 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.

### 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.

Model 515 Integral Mount Paddlewheel Flow Sensor



Sensor Part Number		
<b>3-8510</b>	Flow Sensor for integral mounting on the 8150 or 8550 instrument using the 3-8051 adapter (instrument and adapter sold separately)	
↓	Body/Rotor/Pin Material-Choose One*	
	- P Polypropylene/Black PVDF/Titanium	
	- T Natural PVDF/Natural PVDF/Natural PVDF**	
	- V Natural PVDF/Natural PVDF/Hastelloy-C**	
	Pipe Size - Choose One	
	0	½ to 4 in.
	1	5 to 8 in.
↓		
<b>3-8510</b>	<b>- P 0 Example Part Number</b>	

\*\*PVDF available ½ in. to 4 in. only

Mfr. Part No.*	Code	Mfr. Part No.*	Code
3-8510-P0	<b>198 864 504</b>	3-8510-T0	<b>159 000 622</b>
3-8510-P1	<b>198 864 505</b>	3-8510-V0	<b>198 864 506</b>

### Guideline: 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:

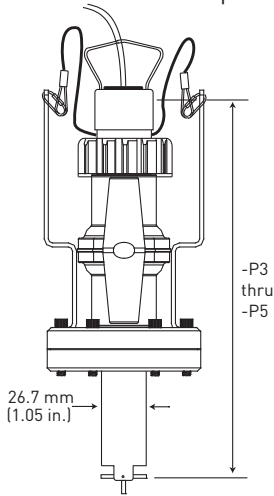
- a) Order the integral adapter kit 3-8051 (sold separately) to connect the sensor to an instrument.
- b) Order a field mount transmitter (sold separately). The following part numbers are compatible: 3-8550-1, 3-8550-2, 3-8550-3, 3-8150-1.

- 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 74 "Integral Mount" for more information.

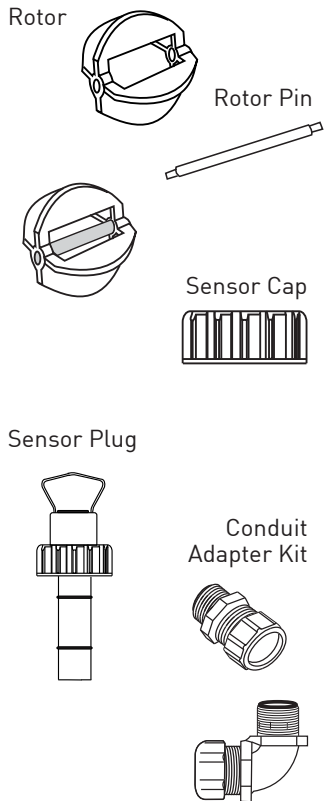
Signet 515 Wet-Tap Sensor with the 3519 Wet-Tap Valve



Pipe Range  
 ½ 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.)

**\*Model 515  
 Ordering Notes**

- 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 (continued)**

**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 60 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).

Sensor Part Number	
<b>P51530</b>	Flow Sensor for wet-tap mounting with the 3519 Wet-Tap Valve (sold separately)
↓	Body/Rotor/Pin Material*
	- P Polypropylene/Black PVDF/Titanium
	Pipe Size - Choose One
	3 ½ to 4 in.
4 5 to 8 in.	
5 10 to 36 in.	
↓	
<b>P51530</b>	- P 3 <b>Example Part Number</b>

Mfr. Part No.*	Code
P51530-P3	<b>198 840 310</b>
P51530-P4	<b>198 840 311</b>
P51530-P5	<b>198 840 312</b>

**Guideline: Combining a 515 Wet-Tap Sensor with a 3519 Wet-Tap Valve**

- Sensor can be mounted in a 3519 Wet-Tap Valve (sold separately)
- 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.

**Accessories and Replacement Parts**

Mfr. Part No.	Code	Description
<b>Rotors</b>		
M1538-2	<b>198 801 181</b>	Rotor, PVDF Black
P51547-3	<b>159 000 474</b>	Rotor, PVDF Natural
M1538-4	<b>198 820 018</b>	Rotor, Tefzel®
P51550-3	<b>198 820 043</b>	Rotor and pin (matched set), PVDF Natural
3-0515.322-1	<b>198 820 059</b>	Sleeved rotor, PVDF Black
3-0515.322-2	<b>198 820 060</b>	Sleeved rotor, PVDF Natural
3-0515.322-3	<b>198 820 017</b>	Sleeved rotor, Tefzel®
<b>Rotor Pins</b>		
M1546-1	<b>198 801 182</b>	Pin, Titanium
M1546-2	<b>198 801 183</b>	Pin, Hastelloy-C
M1546-3	<b>198 820 014</b>	Pin, Tantalum
M1546-4	<b>198 820 015</b>	Pin, Stainless Steel
P51550-3	<b>198 820 043</b>	Rotor and pin, PVDF Natural
P51545	<b>198 820 016</b>	Pin, Ceramic
<b>O-Rings</b>		
1220-0021	<b>198 801 186</b>	O-ring, FPM (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, FFPM (2 required per sensor)
<b>Miscellaneous</b>		
P31536	<b>198 840 201</b>	Sensor plug, Polypropylene
P31542	<b>198 801 630</b>	Sensor cap, Red
P31934	<b>159 000 466</b>	Conduit cap
P51589	<b>159 000 476</b>	Conduit adapter kit
5523-0222	<b>159 000 392</b>	Cable (per foot), 2 cond. w/shield, 22 AWG
3-8051	<b>159 000 187</b>	Transmitter integral adapter (for use with 8510 and 8512) (see system overview for graphics)
6400-9001	<b>159 001 466</b>	Intrinsic safety barriers (2 required)
3-8051-1	<b>159 000 753</b>	Universal junction box

Rev A (3/09)