

# Sensors for Turbine & Positive Displacement Flow Meter

## Overview

### Sensor

#### Magnetic sensor

#### Non-magnetic sensor

### Output

#### Pulse output pickup

The output is a square wave signal, its frequency is proportional to the instantaneous flow rate.

#### Analog output transmitter

Current output model 4-20mA, output value is proportional to the instantaneous flow rate.

#### Digital display intelligent transmitter

Digital display, analog output, alarm output.

#### Explosion-proof intelligent transmitter

Explosion-proof case with digital display, analog output, alarm output, communication protocol.

## Order code

### 1. Model

S1000- For turbine flow meter

### 2. Sensor

M Magnetic sensor  
N Non-magnetic sensor

### 3. Output

P1 Pulse output  
P2 Linearized pulse output  
A Analog output  
D Digital transmitter  
E Ex-proof transmitter

### 4. Temperature

T1 -40...212°F (-40...100°C)  
T2 -40...302°F (-40...150°C)  
T3 -40...446°F (-40...230°C)

### 1. Model

S2000- For positive displacement flow meter

### 2. Sensor

N Non-magnetic sensor

### 3. Output

P1 Pulse output  
P2 Linearized pulse output  
P3 Dual-pulse output (90° phase shift)  
A Analog output  
D Digital transmitter  
E Ex-proof transmitter

### 4. Temperature

T1 -40...212°F (-40...100°C)  
T2 -40...302°F (-40...150°C)  
T3 -40...446°F (-40...230°C)

## Wiring & Size

### 1. Pulse output (Turbine & Positive Displacement)



Specifications	
Power supply	10...30VDC
No load current	<9mA
Output	PNP / NPN
Reverse polarity protection	Yes
Short circuit protection	Yes
Probe operating temperature	-40...212°F (Optional -40...302°F / -40...446°F) -40...100°C (Optional -40...150°C / -40...230°C)
Ambient temperature	-40...185°F (-40...85°C)
Electrical connection	M12 x 1 plug
Protection class	M12 x 1 plug: IP67

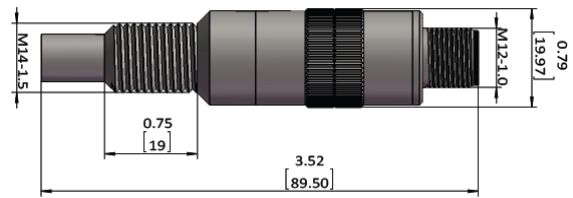
#### Wiring

M12 plug	PNP	NPN												
<table border="1"> <thead> <tr> <th>Pin</th> <th>Color</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Brown</td> <td>Power +</td> </tr> <tr> <td>4</td> <td>Black</td> <td>Pulse</td> </tr> <tr> <td>3</td> <td>Blue</td> <td>Power -</td> </tr> </tbody> </table>	Pin	Color	Signal	1	Brown	Power +	4	Black	Pulse	3	Blue	Power -		
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1	Brown	Power +												
4	Black	Pulse												
3	Blue	Power -												

#### Dimensions in inch (mm)



For Turbine Flow Meter



For Positive Displacement Flow Meter

## 2. Linearized pulse output (Turbine & Positive Displacement)



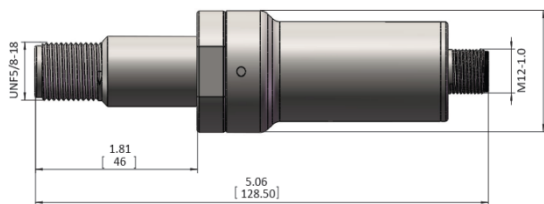
### Specifications

Power supply	12...30VDC
No load current	<20mA
Output	PNP / NPN
Reverse polarity protection	Yes
Short circuit protection	Yes
Probe operating temperature	-40...212°F (Optional -40...302°F / -40...446°F) -40...100°C (Optional -40...150°C / -40...230°C)
Ambient temperature	-40...185°F (-40...85°C)
Electrical connection	M12 x 1 plug
Protection class	M12 x 1 plug: IP67

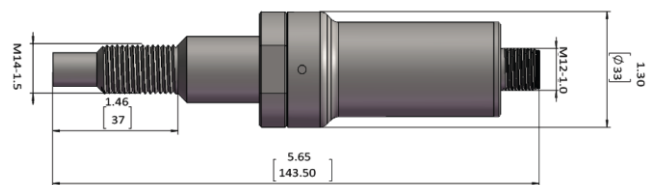
### Wiring

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3	Blue	Power -												

### Dimensions in inch (mm)



For Turbine Flow Meter



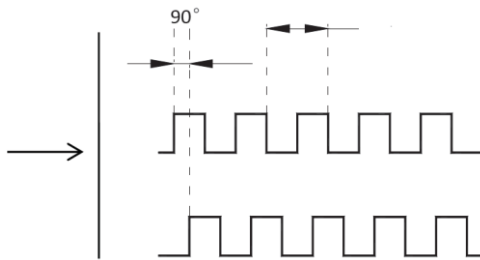
For Positive Displacement Flow Meter

### 3. Dual pulse output (Positive Displacement)

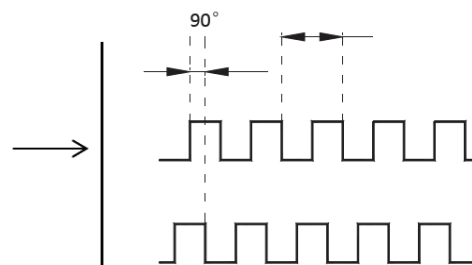


Specifications	
Power supply	10...30VDC
No load current	<9mA
Output	PNP / NPN
Reverse polarity protection	Yes
Short circuit protection	Yes
Probe operating temperature	-40...212°F (Optional -40...302°F / -40...446°F) -40...100°C (Optional -40...150°C / -40...230°C)
Ambient temperature	-40...185°F (-40...85°C)
Electrical connection	M12 x 1 plug
Protection class	M12 x 1 plug: IP67

#### 90° phase shift between dual pulse output



Direction1:  
Output 1 is 90 degree ahead of the output 2



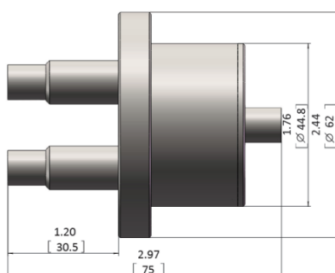
Direction2:  
Output 1 is 90 degree behind of the output 2

#### Wiring

M12 plug	PNP	NPN															
<table border="1"> <thead> <tr> <th>Pin</th> <th>Color</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Brown</td> <td>Power +</td> </tr> <tr> <td>2</td> <td>White</td> <td>Pulse</td> </tr> <tr> <td>4</td> <td>Black</td> <td>Pulse</td> </tr> <tr> <td>3</td> <td>Blue</td> <td>Power -</td> </tr> </tbody> </table>	Pin	Color	Signal	1	Brown	Power +	2	White	Pulse	4	Black	Pulse	3	Blue	Power -		
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Note: the dotted line is for the second (B phase) signal of flow meter with forward/reversed detection feature.

#### Dimensions in inch (mm)



For Positive Displacement Flow Meter

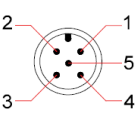
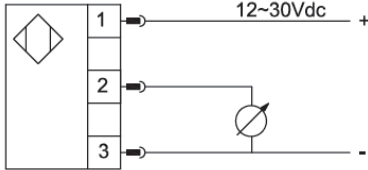
#### 4. Analog output (Turbine & Positive Displacement)



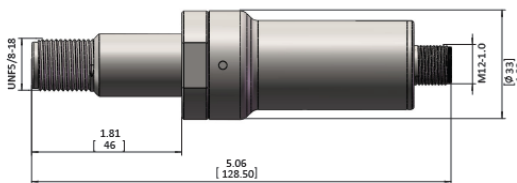
#### Specifications

Power supply	10...30VDC
No load current	<12mA
Output	3-wire 4...20mA
Reverse polarity protection	Yes
Short circuit protection	Yes
Probe operating temperature	-40...212°F (Optional -40...302°F / -40...446°F) -40...100°C (Optional -40...150°C / -40...230°C)
Ambient temperature	-40...185°F (-40...85°C)
Electrical connection	M12 x 1 plug
Protection class	M12 x 1 plug: IP67

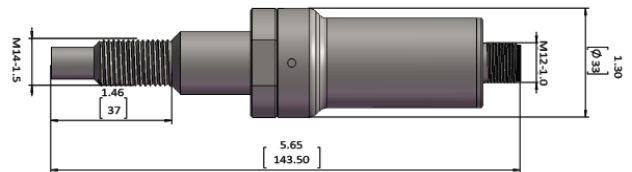
#### Wiring

M12 plug	4...20mA												
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#### Dimensions in inch (mm)



For Turbine Flow Meter



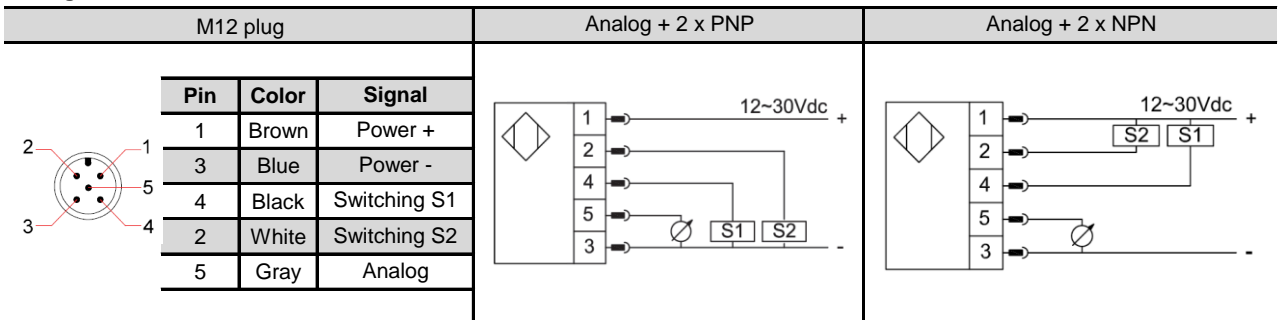
For Positive Displacement Flow Meter

### 5. Intelligent transmitter with digital display (Turbine & Positive Displacement)

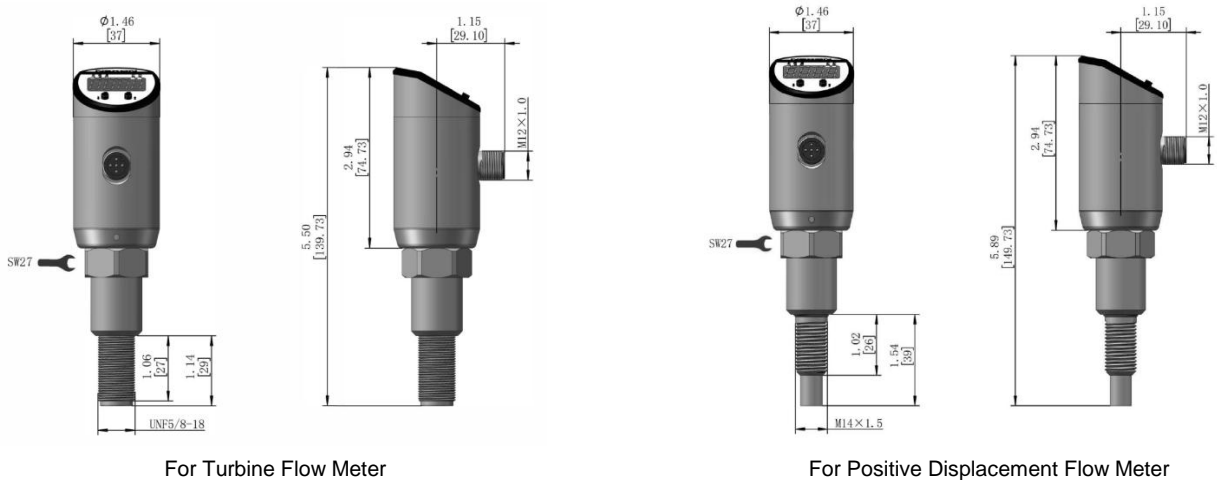


Specifications	
Power supply	10...30VDC
No load current	<12mA
Switching output	Push-pull (compatible to PNP / NPN)
	Switching capacity: 500mA (24VDC)
Analog output	2-wire 4...20mA
	Load RA(Ω) ≤ (Us-10)V/0.02A
	Linearity: ≤0.01% of reading
Accuracy	≤0.02% of reading
Ambient temperature	-40...185°F (-40...85°C)
Probe operating temperature	-40...212°F (Optional -40...302°F / -40...446°F)
	-40...100°C (Optional -40...150°C / -40...230°C)
Display	4-digit LED
Material	Stainless steel 304
Electrical connection	M12 x 1 plug
Protection class	IP67

#### Wiring



#### Dimensions in inch (mm)

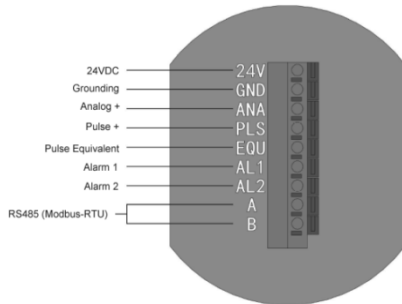


**6. Ex-proof intelligent transmitter (Turbine & Positive Displacement)**

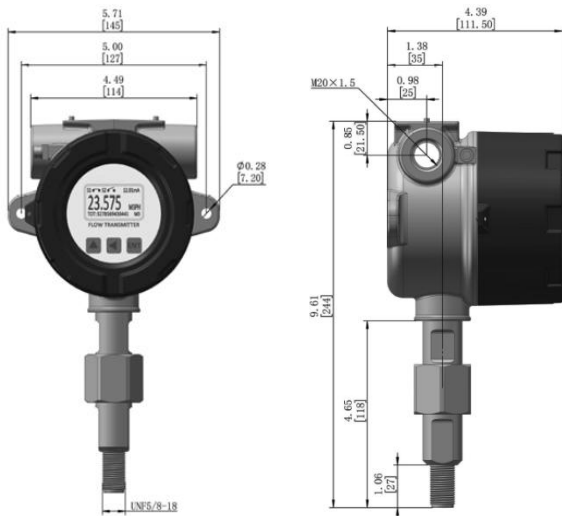


Specifications	
Power supply	10...30VDC / 95...240VAC, Max. 2.2W
No load current	<12mA
Analog output	2-wire 4...20mA
Pulse output	Switching capacity: 500mA (24VDC)
Switching output	Push-pull (compatible to PNP / NPN)
Display	5-bit for instaneous flow rate
	13-bit for total flow rate
	Volume unit: m <sup>3</sup> / L / gal / FT <sup>3</sup>
	Time unit: day, hr, min, sec
	Refresh: 1s
Accuracy	0.01%
Probe operating temperature	-40...212°F (Optional -40...302°F / -40...446°F)
	-40...100°C (Optional -40...150°C / -40...230°C)
Ambient temperature	-40...140°F (-40...60°C)
Ex-proof	EX d IIC T6
Material	Stainless steel 304
Electrical connection	M20 x 1 plug
Protection class	IP65

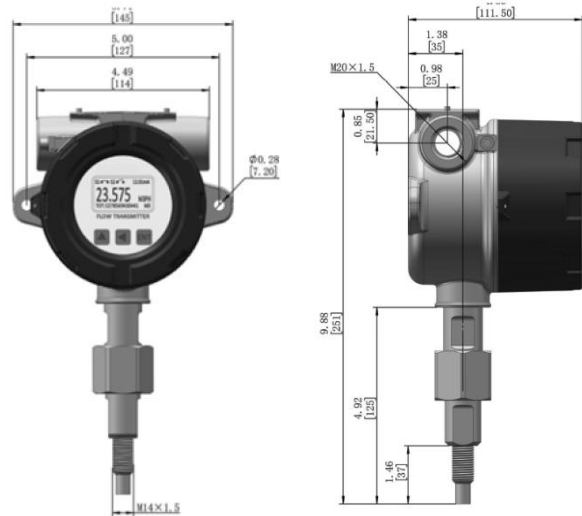
**Wiring**



**Dimensions in inch (mm)**



For Turbin Flow Meter



For Positive Displacement Flow Meter