



# WTS Stainless-Steel Turbine Meter Installation and Operation

## General Information

This unique system of 2" to 8" turbine meters uses one moving part, a precise helical rotor. Rotation of the rotor is electronically detected and processed. High-quality jewel bearings provide long wear life in non-lubricating fluids. The entire rotor assembly can be easily taken out of the meter for field service, without removing the meter from the pipe.

WTS bodies are fabricated from stainless steel tubing. The turbine insert is machined from a stainless steel casting. Standard rotor is polypro, with PVDF as an optional material.

An electronic register can be mounted on the meter to display flow rate, total (resettable or non-resettable) and provide a programmable pulse output. The same unit, in a wall mount or panel mount housing, can be located up to 2,000 feet away. It is not necessary to have any processing electronics on the meter itself unless local reading is desired. Other electronics options (which can again be meter or remote mounted) are the AO45 blind 4-20 mA transmitter, the PD10 divider, and a battery-operated rate/totalizer.

## Specifications

### Materials

Meter Body	T304 ss
Turbine Insert	CF8M Cast Stainless
Turbine Rotor	Polypro, PVDF optional
Shafts	Zirconia ceramic
Bearings	Sapphire journal, ruby ball

**Pressure** 200 PSI working

### Temperature

Standard	140° F
High-temp	250° F

**Accuracy** ± 1% FS

### Flow Range (GPM)

	2"	3"	4"	6"	8"
<b>Min</b>	2	3	6	12	30
<b>Max</b>	150	400	600	1200	3000

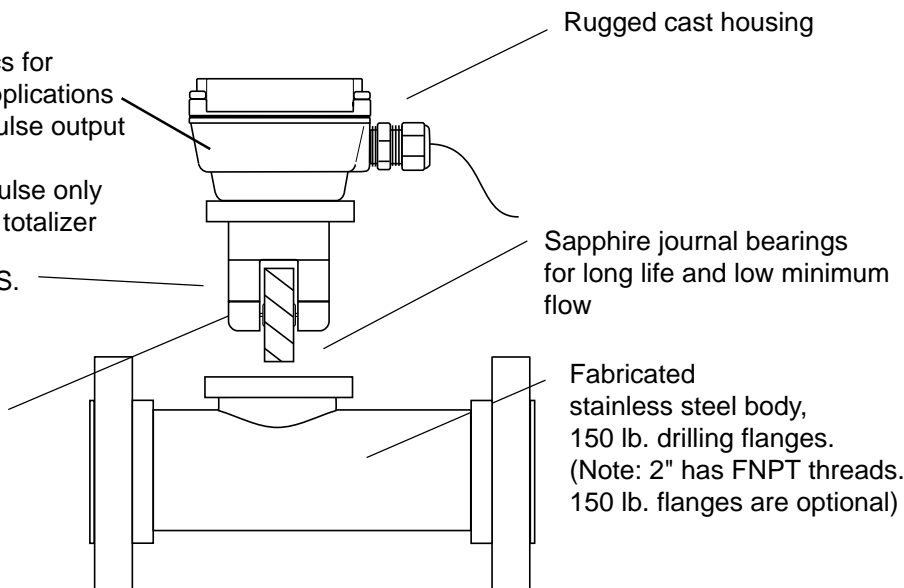
## Features

Modular electronics for a wide range of applications

- Rate/Total and pulse output
- Analog 4-20 mA
- Programmable pulse only
- Battery-powered totalizer

One-piece cast S.S. insert removes easily for service

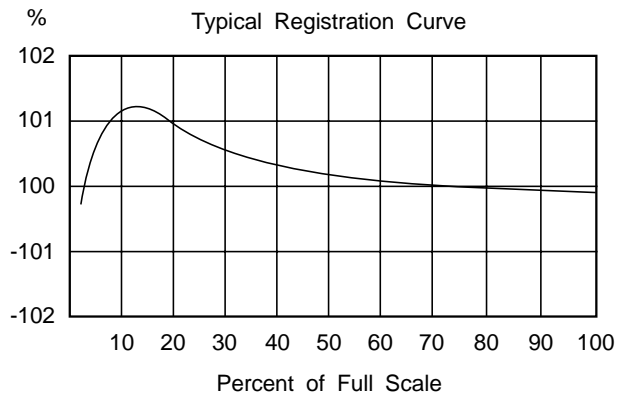
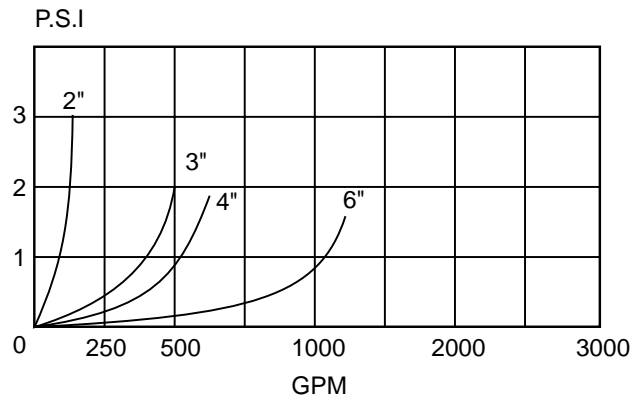
Rotor is the only moving part.



## Electronic Options Specifications

<b>WT100 (Pulse Only)</b>	
<b>Power</b>	6-24 VDC
<b>Pulse Type</b>	Current sinking
<b>WT101</b>	
<b>Power</b>	12-32 VDC, 1.5 mA current loop powered 24 VDC optional
<b>Rate</b>	8-digit autorange
<b>Total</b>	8-digit, selectable decimal Reset standard, non-reset option
<b>Memory</b>	Nonvolatile (no battery needed)
<b>K-factor Range</b>	.050 - 1,999.999
<b>Pulse Output</b>	0.1 second, open collector
<b>Pulse Range</b>	0.1 - 99,999 gallons per pulse
<b>Analog Output</b>	4-20 mA, user-programmed span, two wire
<b>WT102 (Blind Transmitter)</b>	
<b>Output</b>	4-20 mA
<b>Loop Power</b>	12 - 36 VDC (isolated)
<b>Accuracy</b>	± 1%
<b>Response Time</b>	3 sec., 95% FS
<b>WT104 (Battery-powered Ratemeter)</b>	
<b>Rate &amp; Total</b>	LCD readout w/resettable totalizer display
<b>Battery Life</b>	3 Years
<b>Battery Type</b>	Lithium, replaceable

Pressure Loss Chart

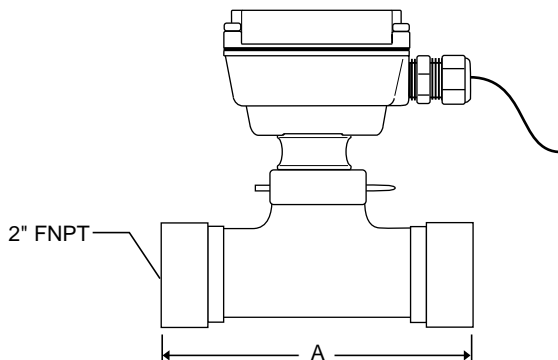


## Dimensions

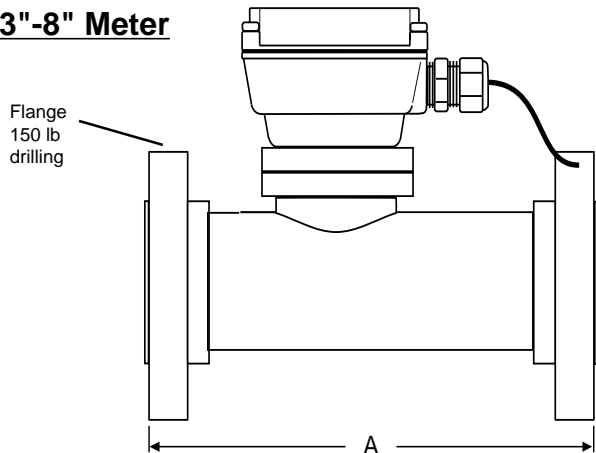
Meter size	Dimen. A
2"	8"*
3"	12"
4"	14"
6"	18"
8"	20"

\* Female NPT threaded ends standard, flange or weld ends available

### 2" Meter



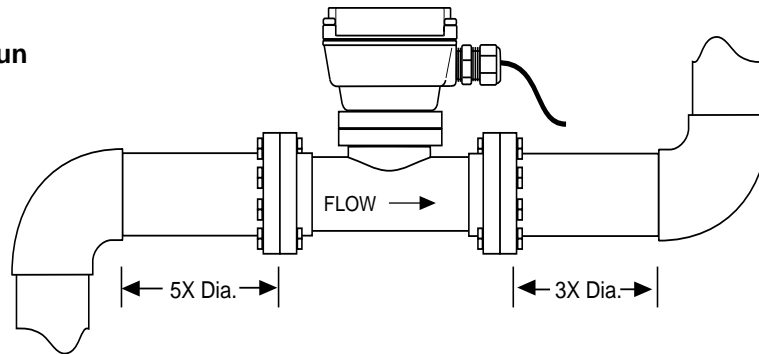
### 3"-8" Meter



## Installation

**Piping Conditions.** In general, the standard practice of installing the meter with ten diameters of straight pipe upstream and five downstream are recommended. However, it is possible under some circumstances to operate with less, particularly if the meter is equipped with an optional internal flow straightener. (See diagram below)

### Minimum Straight Run



**Flanges.** Standard flanges are 150 lb. ANSI drilling. Either partial or full-face gaskets can be used. When installing, tighten the bolts evenly, and use care to prevent a misaligned gasket from entering the flow stream.

**Position.** The WT Series are all-position meters, and can be operated in a vertical or horizontal position, and with the meter insert in any radial position. A horizontal insert position is preferred if there is a risk of air becoming trapped due to constant low flows. Operating the meter in partially-filled pipe will result in inaccuracies.

**Connections.** Most WT meters require electrical connections. See the connections diagram for the one relevant to your meter.

## Operation

For operating instructions for the various electronic modules, consult the manual for the specific module. This should be included with the meter when purchased.

## Maintenance and Repair

**Recalibration.** If it is necessary to recalibrate the meter for any purpose, this can be done by any SeaMetrics-authorized facility. Call the factory for information.

**Turbine Insert Removal and Installation.** In order to repair any mechanical parts (rotor or shafts) it is neces-

sary to remove the turbine insert. To do this, first remove all pressure from the line. Then remove the machine screws which hold the top flange in place. Lift off the flange with attached insert.

**Rotor and Shaft Replacement.** Examine the rotor to determine if bearings or shaft are damaged or excessively worn. The rotor should spin smoothly and freely

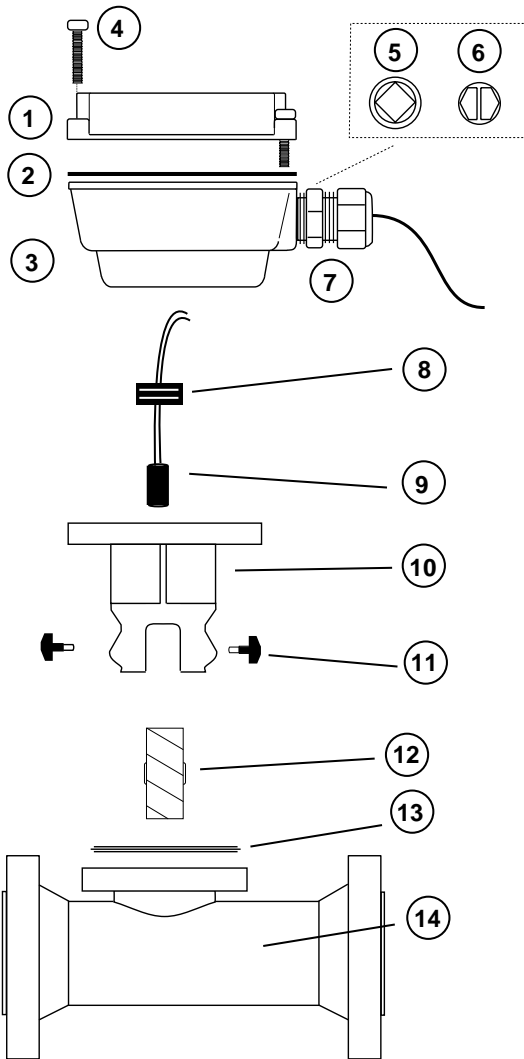
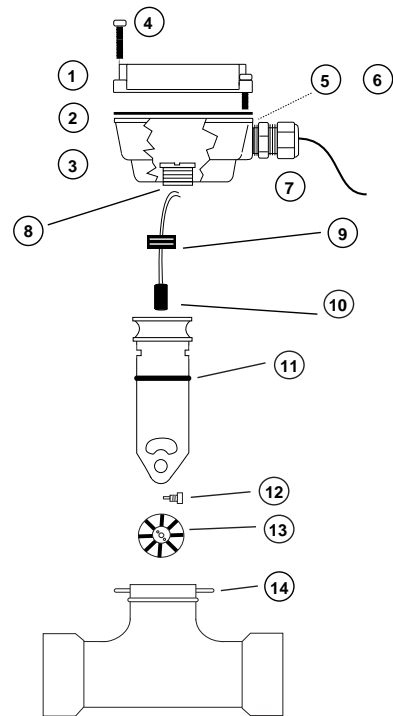
with no visible wobble. Back and forth play should be very minor, less than 1/64". If it is necessary to replace the rotor or shafts, first back out both shafts with a screwdriver. The rotor will come free as soon as the shaft ends come free of the rotor bearings. Reverse the procedure to reinstall, taking care to maintain a small amount of free play between the shaft ends and the bearings.

**Sensor Replacement.** This procedure is rarely necessary. However, certain electrical conditions can damage the sensor. To replace it, first remove any electronics module in the aluminum electronics housing. Disconnect the sensor leads from terminals on the back of the board. Unscrew the sensor retaining screw carefully and then remove the sensor by tugging gently on the sensor leads.

**Electronic Module Repair.** None of the electronics modules have replaceable components. Printed circuit boards must be replaced as complete units. In order to replace an electronic module, loosen the four screws which fasten each unit. Once the screws are loose, the unit will lift free from the insert housing.

## WT(S) Meter Assembly:

WT(S) Parts - 2"		
1-6	Housing (see chart below)	
7	Strain relief	7655
8	Housing retaining screw	25146
9	Sensor retaining screw	25321
10	Sensor	26310
11	O-ring	25081
12	Shaft screw	16710
13	Turbine rotor	25947
14	U-clip	15527



WT(S) Parts - 3"-8"		
1	Upper blind housing	26181
1	PD10 divider module	11090
1	FT420 rate/total display module	25374
1	AO45 4-20 mA transmitter module	11250
1	FT415 rate/total display module	26457
2	Gasket	2616 5
3	Lower housing	29930
4	Housing screw	29938
5	Plug, steel	26073
6	Plug, plastic	26079
7	Strain Relief	7655
8	Sensor Retainer	25321
9	Sensor	26310
10	Insert 3"-8"	16820
11	Turbine shaft screw (2)	16710
12	Turbine rotor (Standard)	16750
12	Turbine Rotor (PVDF)	25962
13	O-Ring	25105
14	Meter Body	

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