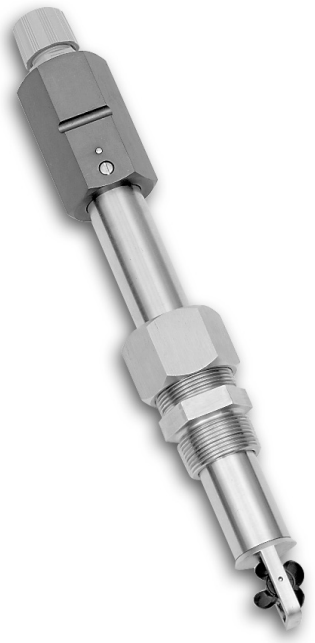
Turbo-Flo™

Stainless Steel Probes



Turbo-Flo™ probes offer the precision of turbine technology with rugged construction. The practical design of the probe includes a bluff bar which protects the turbine from foreign materials in the stream as well as from over insertion. Installation is simple and does not require special fittings. The Turbo-Flo™ probe may be installed in standard pipe tees, through pipe saddles, welding spuds and 1½" full opening ball or gate valves.

Features

- 304 stainless steel construction.
- Probe lengths from 6 to 54 inches for use in pipe sizes as large as 72 inches in diameter.
- Maximum operating pressure of 1000 psig.
- Adjustable insertion length for your pipe size.
- Rugged construction for industrial environments.
- No external power required.
- Wide measuring range with 30:1 turndown.
- Low mass Delrin® turbines offer improved sensitivity and long life.
- Use standard pipe fittings for installation.

Principle of Operation

The turbine is positioned in the mid-section of the pipe with its axis of rotation parallel with the flow stream. Fluid velocity causes the turbine, which has a ring magnet inside of its hub, to rotate in proportion to flow rate. As the turbine rotates, the magnetic field passes through a coil in the probe body, generating a pulse output in proportion to the turbine rotation speed. Flow volume is then determined from fluid velocity measurement and pipe diameter information.

Applications

- Water and other aqueous solutions
- Chiller and cooling tower loops
- Well monitoring
- Water treatment and storage
- Pumping stations
- Irrigation projects

Options

The TF-10000 Insertion Handle facilitates installation in low pressure systems. (25 psig maximum)

Probe mounted options include 4-20 mA signal output transmitters and displays.

The LCD rate/total display does not require external power. Turbine rotation recharges the lithium power cell in the display.

Transmitters and displays can also be wall mounted.
Shown:
TF-15350-2 Rate/total display
TF-15390 Rate/total display with 4-20 mA transmitter

TF-15385 4-20 mA transmitter (no display)

The wall mounted TF-15275 Flow Controller includes 4-20 mA signal output, two adjustable flow rate set points each with SPDT normally open 5A contacts. Set points may be adjusted in 10% of full scale increments. NEMA 4X enclosure. 120/240 vac, 50/60 Hz, or 24 vdc.

Turbo-Flo™

20 Series

TF.20S

Stainless Steel Probes

Sizing Data

Pipe Size (inch)	ID (inch)	GPM Range Threshold	GPM Range Max	Ft/Gallon	Pulse/Gallon
1.5	1.610	4	120	9.454	21.46
2	2.067	6	180	5.736	13.08
2.5	2.469	8	240	4.020	9.648
3	3.068	12	360	2.593	7.131
3.5	3.548	16	500	1.947	5.160
4	4.026	20	600	1.512	3.840
5	5.047	32	1000	0.962	2.60
6	6.065	46	1400	0.666	1.88
8	7.981	80	2400	0.384	1.00
10	10.020	125	3800	0.244	0.625
12	11.938	175	5400	0.172	0.432
14	13.125	210	6300	0.142	0.366
16	15.0	280	8400	0.109	0.286
18	16.876	350	10500	0.086	0.225
20	18.814	450	14000	0.069	0.181
24	22.626	650	20000	0.0479	0.125
30	29.250	1200	36000	0.0286	0.075
36	35.250	1600	48000	0.0197	0.0517
42	41.250	2200	70000	0.0144	0.0377
48	47.250	2800	84000	0.0110	0.0288
54		3600	108000	0.0084	0.02202
60		4500	135000	0.00681	0.01784
72		6500	195000	0.00473	0.01239

Specifications

Accuracy: ±1.0%
Repeatability: ±0.5%
Linearity: ±0.5%
Turndown: 30:1
Insertion length: 06 = 6 inches
08 = 8 inches
12 = 12 inches
18 = 18 inches
24 = 24 inches
38 = 38 inches

Threshold: 0.5 ft/s or
$1.22 \times ID^2 = GPM$

Liquid Velocity: $ft/s = \frac{0.408 \times GPM}{pipe\ ID^2}$

Point Velocity = 2.625 pulses/ft/s

Pulse/gallon correction for uncharted pipe diameters =

$$\frac{ID^2\ charted\ pipe}{ID^2\ uncharted\ pipe} \times \text{Pulse/gallon charted pipe}$$

Materials of Construction:
Probe: 304 stainless steel
Connector: Brass or 303sst
Turbine: Delrin® or Polypropylene
O-rings: Buna-n or Viton®
Temperature Limits: 225ºF(107ºC)
Pressure Limits: 1000 psig (69 barg)

Turbo-Flo™ part number construction

20 Series	1 Body Mat'l	18 Size	B Connector	3 Turbine	2 Shaft	7 O-ring	-	1	5	3	2	5 Option
20-Standard	**1-**304ss	**06-**6"	**A-**303ss 1¼"	**3-**Delrin®	**2-**316ss	**7-**Buna						
		08-8"	**B-**303ss Recessed 1½"	**5-**Polypro		**8-**Viton®						
		12-12"										
		18-18"	**C-**Brass Recessed 1½"									
		24-24"										
		38-38"										
		54-54"										

When probe mountable electronics are to be factory installed on the probe, a dash is added to the probe model number followed by five numeric digits for the accessory to be added.
The example depicts an 18" 304ss probe with 303SS 1½" recessed connector, Delrin turbine, 316ss shaft, buna o-rings including a probe mounted TF-15325 4-20 mA transmitter.

Electronics available for probe mounting are:
TF-**15325** 4-20 mA Transmitter, Probe Mount
TF-**15375** 4-20 mA Transmitter with Totalizer/Ratemeter, Probe Mount
TF-**15350** Totalizer/Ratemeter, Probe Mount
TF-**15504** Frequency Output, Probe Mount

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