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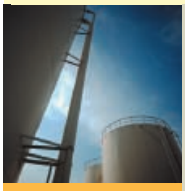
Product Specifications

For over 35 years, Thermo Scientific inline liquid and gas turbine flowmeters have provided highly accurate and repeatable flow measurements. Easy to install and maintain, with minimal disruption to the process, the turbine offers a dependable economical flow metering solution for a wide range of industrial applications.

Model 6500
Model 6600

Inline Turbine Flowmeters for Liquid and Gas



From ultrasonic designs for larger pipes to turbine models for smaller pipes and fiscal management applications, Thermo Scientific turbine meters are cost-effective, accurate and reliable. Our inline turbine flowmeters for liquid or gas are widely used in the oil and gas, petrochemical and water treatment sectors and are designed to handle tough industrial applications at a competitive price.

The turbine meter consists of a compact body or spool piece that contains a rotating impeller. The assembly functions very much like a "windmill" in that the rotational speed is directly proportional to the flow rate. The rotor, manufactured from magnetic stainless steel, generates a pulsed output as the blades rotate through the flux field of a magnet that is contained in the pickup assembly. This feature allows the instrument to function without the need for an exterior power source so that it can be installed in a remote location with a battery powered totalizer or data logger.

The flow measurement data can be read in the field via the local display or can be transmitted to a DCS. Alternatively, a 4-20 mA output can go directly into the customer's own process control system.

Turbines are easy to install due to their compact design, which results in minimal downtime for installation and maintenance. Most models are available with standard NPT threads or a variety of ANSI flanges.

Industries

- Oil and Gas
- Petrochemical
- Aerospace
- Water Treatment
- General Process

Features

- Wide range of meter sizes and flange options
- Individually calibrated
- High levels of accuracy and repeatability
- Low pressure drop
- Field repairable
- Cost effective, proven technology

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Model 6500 Inline Turbine Flowmeter

The Model 6500 turbine flowmeter is intended for the highly accurate measurement of liquids and gases over a wide range of pipe sizes from 13 mm to 300 mm (0.5 in to 12 in) in diameter. The Model 6500 gives continuous, reliable flow measurement with accuracy levels of better than 0.5% for liquid and 1% for gas. Each instrument is factory calibrated and can be subject to third party calibration, if required, for an additional fee.

Model 6600 Custody Transfer Liquid Inline Turbine Flowmeter

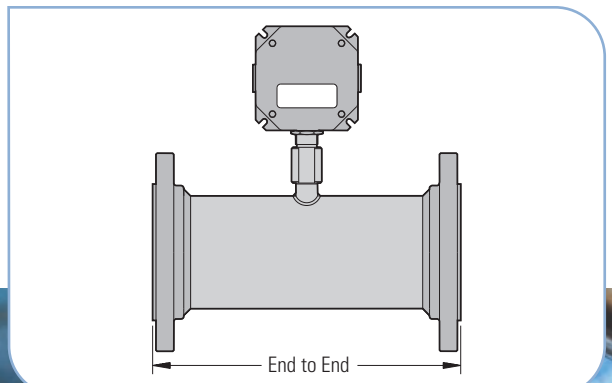
The Model 6600 custody transfer turbine flowmeter is designed to provide highly accurate liquid flow measurement under the exacting conditions encountered in the refining and petrochemical industry. Capable of achieving accuracy of ±0.15% or better over a specified flow range, it is specifically intended for use in fiscal or custody transfer applications. The Model 6600's unique design provides improved viscosity compensation and low pressure drop. Two pickups are included as standard for dual pulse integrity and superior resolution.

Inline Turbine Flowmeter Physical Dimensions

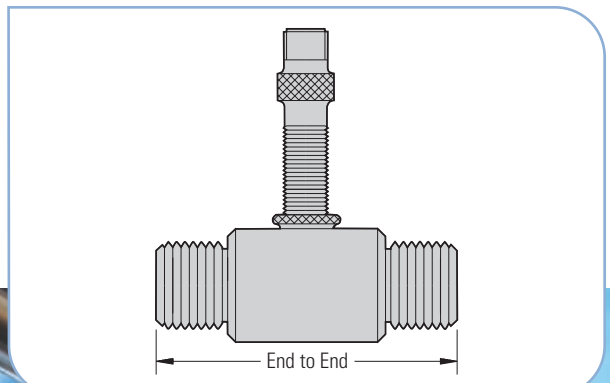
Nominal Bore Size			Flanged Meters End to End		Threaded Meters End to End	
	mm	inches	mm	inches	mm	inches
C	13	0.5	127	5	64	2.5
D/E	16	0.625	127	5	64	2.5
F	19	0.75	140	5.5	83	3.25
G	25	1	152	6	89	3.5
H	38	1.5	178	7	114	4.5
J	51	2	197	7.75	133	5.25
K	76	3	254	10		
L*	102	4	356	14		
M*	152	6	368	14.5		
N*	203	8	457	18		
P*	254	10	457	18		
R*	304	12	457	18		

**Dimensions apply to both Model 6500 and Model 6600 Inline Turbine Flowmeters*

Flanged Flowmeter Dimensions



Threaded Flowmeter Dimensions



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Model 6600 Custody Transfer Liquid Inline Turbine Flowmeter Ordering Information

MODEL NUMBER
66: Model 6600 Flowmeter with 316 Stainless Steel Body

A. FLUID TYPE
L: Liquid (Standard Liquid Applications)

B. FLOW RANGE/NOMINAL BORE/END TO END

	FLOW RANGE		NOMINAL BORE		END TO END	
	GPM	(m^3/h)	mm	inch	mm	inch
L:	120-1200	27-270	102	4	356	14
M:	240-2400	55-550	152	6	368	14.5
N:	480-4800	110-1100	203	8	457	18
P:	840-8400	190-1900	254	10	457	18
R:	1200-12000	270-2700	304	12	457	18

C. PICKUP OPTIONS
1: Standard with flying leads
3: I.S. (Zone 0) with flying leads
5: Flameproof (Zone 1) with flying leads

D. TEMPERATURE RANGE
T1: -20°C to +150°C (0°F to +300°F)

E. PROCESS CONNECTION
01: ANSI Class 150 lb raised face, A105 carbon steel, slip on
02: ANSI Class 300 lb raised face, A105 carbon steel, slip on
03: ANSI Class 600 lb raised face, A105 carbon steel, slip on
05: ANSI Class 150 lb raised face, stainless steel, slip on
06: ANSI Class 300 lb raised face, stainless steel, slip on
07: ANSI Class 600 lb raised face, stainless steel, slip on
XX: Special — consult our applications department

F. TERMINATION (Two Outputs per Flowmeter)
01: 1-in NPT for ex-proof enclosure
02: M25 thread for I.S. or flameproof use

G. HAZARDOUS AREA REQUIREMENT
S: Non-hazardous/safe area operation
I: ATEX Intrinsically safe EEx ia IIB T5
D: ATEX Flameproof EEx d IIB T5
7: UL (C & US) Explosion proof enclosure Class I, Groups B, C, D

H. Refer to Interface Electronics

MODEL NUMBER	FLUID TYPE	FLOW RANGE/NOMINAL BORE/END TO END	BODY MATERIAL	TEMPERATURE RANGE	PROCESS CONNECTION	TERMINATION	HAZARDOUS AREA REQUIREMENT	H
66	A	B	C	D	E	F	G	H

Trim this page short (7.625 inches) to accomodate potential hole punching by end users

Model 6500 Inline Turbine Flowmeter Ordering Information

MODEL NUMBER
65: Model 6500 Inline Turbine Flowmeter with 316 Stainless Steel Body

A. FLUID TYPE
G: Gas
L: Liquid (Standard Liquid Applications)

B. FLOW RANGE/NOMINAL BORE/THREAD

	FLOW RANGE (Liquid) USGPM	l/m	FLOW RANGE (Gas) acfm	am3/h	NOMINAL BORE mm	inch	THREAD NPT
C:	0.5-5	1.8-18	N/A	N/A	13	0.5	0.5
D:	1-10	3.6-36	0.5-3.75	0.88-6.6	16	0.625	0.75
E:	1.8-18	7-70	1-7.5	1.6-12	16	0.625	0.75
F:	3.6-36	14-140	2-15	3.2-24	18	0.75	0.75
G:	7.5-75	28-280	5-30	6.4-48	25	1	1
H:	15-150	56-560	6-60	10-100	38	1.5	1.5
J:	30-300	112-1120	12-120	20-200	51	2	2
K:	60-600	225-2250	24-240	40-400	76	3	Flanged only
L:	120-1200	450-4500	48-480	80-800	102	4	Flanged only
M:	240-2400	900-9000	100-1000	160-1600	152	6	Flanged only
N:	480-4800	1800-18000	200-2000	320-3200	203	8	Flanged only
P:	840-8400	3200-32000	300-3000	500-5000	254	10	Flanged only
R:	1200-12000	4500-45000	450-4500	800-8000	304	12	Flanged only
X:	Special — Consult our applications department						

C. PICKUP OPTIONS
1. Standard with flying leads
2. Standard with 2 pin cannon
3. I.S. (Zone 0) with flying leads
4. I.S. (Zone 0) with 2 pin cannon
5. Flameproof (Zone 1) with flying leads
6. High temperature pickup (refer to T3 below)

D. TEMPERATURE RANGE
T1: -20°C to +150°C (0°F to +300°F)-- — must be used for intrinsically safe operation
T3: -200°C to +230°C (-300°F to +450°F) — safe area use only

E. PROCESS CONNECTION
S1: Male NPT
S2: Male BSP
01: ANSI Class 150 lb raised face, A105 carbon steel, slip on
02: ANSI Class 300 lb raised face, A105 carbon steel, slip on
03: ANSI Class 600 lb raised face, A105 carbon steel, slip on
05: ANSI Class 150 lb raised face, stainless steel, slip on
06: ANSI Class 300 lb raised face, stainless steel, slip on
07: ANSI Class 600 lb raised face, stainless steel, slip on
XX: Special — consult our applications department

F. TERMINATION
00: No threaded stub
01: 1-in NPT for ex-proof enclosure or local indicator
02: M25 thread for safe area, I.S. or flameproof
04: 0.75-in NPT for meters smaller than 0.75 in

G. HAZARDOUS AREA REQUIREMENT
S: Non-hazardous/safe area operation
I: ATEX Intrinsically safe EEx ia IIB T5
D: ATEX Flameproof EEx d IIB T5
7: UL (C & US) Explosion proof enclosure Class I Groups B, C, D

H. Refer to Interface Electronics

MODEL NUMBER	FLUID TYPE	FLOW RANGE/NOMINAL BORE/THREAD	PICKUP OPTIONS	TEMPERATURE RANGE	PROCESS CONNECTION	TERMINATION	HAZARDOUS AREA REQUIREMENT	
65	A	B	C	D	E	F	G	H

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Interface Electronics for Turbine Flowmeters

INTERFACE ELECTRONICS

A: ATEX Flameproof enclosure with terminal block

B: ATEX Flameproof enclosure with 4-20 mA analog amplifier

C: ATEX Flameproof enclosure with 4-20 mA current modulated pulse

D: ATEX Enclosure with terminal block for I.S. service (must be used with I.S. pickup)

E: ATEX Enclosure with 4-20 mA current modulated pulse amplifier for I.S. service (must be used with I.S. pickup)

F: Explosion-proof enclosure with terminal block (CSA)

G: Explosion-proof enclosure with 4-20 mA analog amplifier (CSA)

H: Explosion-proof enclosure with 5 volt square wave amplifier (CSA)

I: Local display with Rate/Total indicator (battery powered)

J: Local display with Rate/Total indicator with 4-20 mA output (loop powered)

K: Local display with Rate/Total indicator with 4-20 mA output + alarm (DC powered)

NOTES:

1. *Items I, J & K are certified Intrinsically safe to European & U.S. standards*
   Europe: ATEX EEX ia IIB T3 (Group II 2G)
   U.S.A.: CSA I.S. for Class I Groups C & D
   Select certification option (I) when specifying local display
2. *All amplifiers require 24 VDC power source*

We can repair or replace turbine products manufactured by the following companies

- Electronic Flow Meters (EFM)
- Automatic Oil Tools (AOT)
- Flow Automation
- Hydril PTD
- Onix Measurement
- Tokheim Automation
- GH Flow Automation

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Model 6500 — Inline Turbine Flowmeter for Liquid and Gas

Functional Specifications		
Accuracy	Liquids:	±0.25% of reading for 3-in meters and above ±0.5% of reading for 2-in meters or below
	Gases:	±1% of reading
Repeatability	0.05%	
Pressure Drop	Liquids:	Typically 300 mbar (4 psi) at normal maximum flow rate in water
	Gases:	Typically less than 0.4 in water gauge at 100% flow rate dependent on gas density
Maximum Pressure	As flange rating; Threaded meters: 250 barG (3500 psiG)	
Physical Specifications		
Body Material	316 stainless steel	
Flange Material	Forged carbon steel or stainless steel	
Shaft and Bearing Material	Shafts:	Tungsten carbide
	Sleeve bearings:	Durable alloy
	Ball bearing:	Stainless steel ANSI 440C
Installation	Install in pipeline with at least 10 pipe diameters of straight length upstream and 5 diameters downstream of flowmeter. For greater accuracy, use upstream flow conditioner.	
Outputs		
Standard Pickup	30mV at 10% of the flow range	

Model 6600 — Inline Turbine Flowmeter for Liquid and Gas

Functional Specifications	
Accuracy	±0.15% of reading over a specified range
Repeatability	±0.02% of reading
Pressure Drop	Typically 300 mbar (4 psi) at normal maximum flow rate in water
Maximum Pressure	As flange rating
Physical Specifications	
Body Material	316 stainless steel
Flanges Material	A105 carbon steel or stainless steel
Bearing Material	Tungsten carbide pinions and sleeves
Outputs	
Standard	30 mV at 10% of the flow range
Installation	Per API guidelines

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