

# Stainless Steel Turbine Flowmeter for Low Viscosity Liquids



measuring  
•  
monitoring  
•  
analyzing

DOT



- Measuring Range:  
0.5...5 GPM to 240...2400 GPM  
(Higher Ranges on Request)
- Linearity:  $\pm 0.5\%$  of Reading
- $p_{\max}$ : 3,600 PSIG for NPT Models
- $t_{\max}$ : 176 °F, 250 °F with mV Output
- Process Connections:  
1/2" ...2" NPT or 1/2" ...6" ANSI Flanges  
(Larger Flange Sizes Upon Request)
- Material: Stainless Steel
- Output: mV Pulse, Transistor Pulse,  
Analog 4-20 mA, or LCD Total, Rate/  
Total, or Batching Display with Analog  
& Switching Outputs



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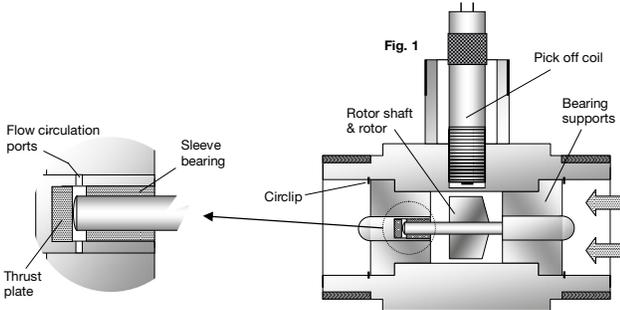


**Description**

The DOT is a highly accurate turbine flowmeter used to measure the flow of clean, low viscosity liquids. Stainless steel construction with tungsten carbide bearings provide a long service life for a wide range of aggressive and non-lubricating liquids.

Operation is as follows: a pick-up coil with a permanent magnet core is mounted in the housing adjacent to the rotor blade tips and a magnetic circuit is created by the rotation blades.

The rotation of the rotor varies the pick up of this magnetic circuit and the flux changes induce a small voltage in the coil, the frequency of which is directly proportional to the rotor speed and the volumetric flow rate. The meter is supplied with standard frequency output (mV or NPN), 4 - 20mA analog output, or one of three local displays: a dual totalizer, a rate totalizer, or a batching totalizer.



**Applications**

- Chemical and Allied Products
- Pharmaceuticals
- Fuels
- Deionized Water
- Fuel Additives
- Petrochemicals
- Plastics and Hydraulics
- Water Conditioning

**Technical Details**

**Sizes:** 1/2" ... 2" NPT, 1/2" ... 6" ANSI, (Larger on Request)  
**Linearity at 1cP:** ± 0.5% of Reading, (± 0.2% with the Linearization Feature of Z3 Electronic)  
**Repeatability:** ± 0.02 ... 0.05% with Steady Flow Conditions

**Maximum Pressure**

**Threaded:** 3,600 PSIG  
**Flanged:** According to ASME B16.5

**Process Temperature**

**F0:** -4...250 °F  
**F4, L0, Zx:** -4...176°F

**Technical Details**

**Pressure Drop:** Approx. 4 PSI at Max. Flow (S.G. = 1.0, Viscosity = 1cP)

**Materials**

**Housing:** 316 Stainless Steel  
**Connections:** 316 Stainless Steel  
**Rotor:** SS 430 (up to DOT-xx15), SS ANC 21 (Duplex Stainless Steel, for Larger Sizes)  
**Bearing Support:** 316 Stainless Steel  
**Bearings:** Tungsten Carbide (Shaft, Bushing, Thrust Plate)

**Supply Voltage**

**F0:** No Supply Voltage  
**F4:** 12...28 V<sub>DC</sub>, Reverse Polarity Protected  
**L0:** 12...36 V<sub>DC</sub>

**Outputs**

**F0:** mV Output, 2 Wire (65' Max Transmission)  
**F4:** NPN, 3-wire  
**L0:** 4 - 20mA Output, 2 Wire  
**Z1, Z2, Z3**  
**ZB, ZE:** See Comparison Table (page 3)

**Electronic Features**

**Z1, Z2, Z3,**  
**ZE, ZB:** See Comparison Table (page 3)

**Protection**

**F0, L0, ZB, ZE:** IP 66/67  
**Z1, Z2, Z3:** IP65  
**F4:** IP55

**Recommended Filtration Requirements:**

Meter Size	Mesh Size
1/2"	120
3/4" ... 1"	80
1-1/2" ... 2"	40
3" ... 12"	10



**Electronics with LCD Display** (for Further Details Please See ZOK or ZOE Datasheet)

Model	..Z1.. (ZOK)	..Z2.. (ZOK)	..Z3.. (ZOK)	..ZE.. (ZOE)	..ZB.. (ZOE)
Function	Dual Totalizer	Batching Unit	Rate/Totalizer		
<b>Power Supply</b>					
External (also for Backlighting)	5 - 28 V <sub>DC</sub>	12 - 28 V <sub>DC</sub>	5 - 28 V <sub>DC</sub>	9 - 28 V <sub>DC</sub>	-
Battery-Operation (Outputs Inactive)	yes	no	yes	yes	yes
Battery Included in Shipment	yes	-	yes	no	yes
<b>LCD Display</b>					
Selectable Units	yes	yes	yes	yes	yes
Decimal Point	yes	yes	yes	yes	yes
Accumulative Total	yes	yes	yes	yes	yes
Resettable Total	yes	yes	yes	yes	yes
Linearization	yes	no	yes	yes	yes
Rate Display	yes	yes	yes	yes	yes
Backlighting	yes	yes	yes	yes	no
<b>Input</b>					
Sensors	NPN				
<b>Outputs</b>					
4-20 mA	no	no	yes	no	no
Flow Rate Alarm Min./Max.	no	no	NPN/PNP/PP	no	no
Batch End & Control	no	yes	no	no	no
Pulse Output	no	no	Push-Pull	Push-Pull	no
2 x SPDT Relays <sup>1)</sup>	no	yes	option	no	no
<b>Installation</b>					
IP 65	yes	yes	yes	IP 66/67	IP 66/67
Cable Entries	M20x1.5 or ½" NPT				
Media Temperature Range (Cooling Fin Option: max. 250 °F)	-4...176 °F				
Ambient Temperature Range	-4... 176 °F				
Housing Material	PA6 GF35 UL94 HB/VO/PC UL94 V-2				
ATEX Approval	no				

<sup>1)</sup> Replaces solid state outputs, for details see ZOK Datasheet



Stainless Steel Turbine Flowmeter Model DOT

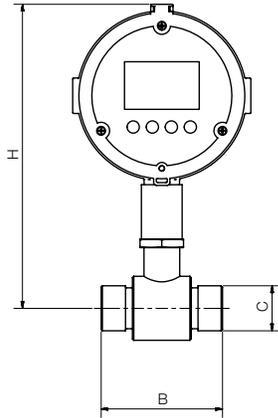
Order Details: Threaded or Flanged Models (Example: DOT-13 15G N5 F00 0)

Housing & Connection Material	Range (GPM)	Process Connection*	Output/Display Electronics and Electrical Connection	Flow Direction
DOT-13.. = SS/SS	..05G.. = 0.5...5	..N4.. = 1/2" NPT ..A4.. = 1/2" ANSI 150 lb	..F00.. = mV Output, 10' Flying Leads ..F0S.. = mV Output, Military Style Connection	..0 = All Directions (No Display) (Not for Zxx Electronics)  ..B = Bottom-Top, Display on Right (Only for Zxx Electronics) ..M = Bottom-Top, Display on Left (Only for Zxx Electronics) ..L = Left-Right, Display on Top (Only for Zxx Electronics) ..R = Right-Left, Display on Top (Only for Zxx Electronics)
	..10G.. = 1.0...10 ..15G.. = 1.8...18 ..20G.. = 3.6...36	..N5.. = 3/4" NPT ..A5.. = 3/4" ANSI 150 lb	..F40.. = NPN Pulse Output, 10' Flying Leads ..F4S.. = NPN Pulse Output, Military Connection	
	..25G.. = 7.5...75	..N6.. = 1" NPT ..A6.. = 1" ANSI 150 lb	..L0N.. = 4-20mA Output, Junction Box, 1/2" NPT ..Z1M.. = Dual Totalizing LCD Display (ZOK), M20 ..Z2M.. = Batch Controlling LCD Display (ZOK), M20 ..Z3M.. = Rate & Total LCD Display (ZOK), M20	
	..30G.. = 15...150	..N8.. = 1-1/2" NPT ..A8.. = 1-1/2" ANSI 150 lb	..ZEM.. = Rate & Total LCD Display (ZOE) (with External Supply and with Battery), M20 ..ZBM.. = Rate & Total LCD Display (ZOE) (without External Supply), M20	
	..35G.. = 30...300	..N9.. = 2" NPT ..A9.. = 2" ANSI 150 lb	..Z1N.. = Dual Totalizing LCD Display (ZOK), 1/2" NPT ..Z2N.. = Batch Controlling LCD Display (ZOK), 1/2" NPT ..Z3N.. = Rate & Total LCD Display (ZOK), 1/2" NPT	
	..40G.. = 60...600	..AB.. = 3" ANSI 150 lb	..ZEN.. = Rate & Total LCD Display (ZOE) (with External Supply), 1/2" NPT ..ZBN.. = Rate & Total LCD Display (ZOE) (without External Supply and with Battery), 1/2" NPT	
	..45G.. = 120...1200	..AC.. = 4" ANSI 150 lb		
	..50G.. = 240...2400	..AE.. = 6" ANSI 150 lb		

\*Note: for 300lb ANSI, replace ..Ax.. with ..Bx..

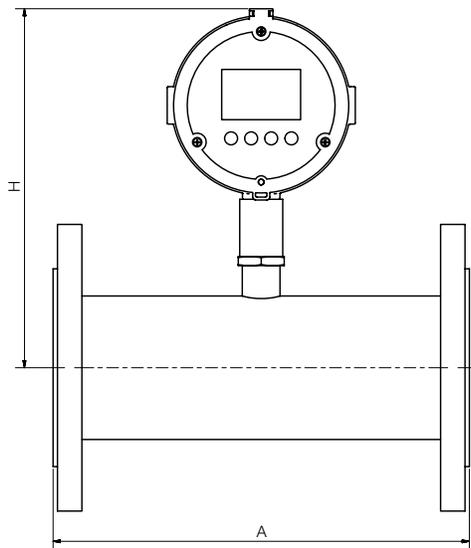
**Dimensions**

**Threaded Models**



Flow (GPM)	Threaded Connection	B	H
0.5...5	1/2"	2.50"	8.74"
1...10	3/4"	2.50"	8.74"
1.8...18	3/4"	2.50"	8.74"
3.6...36	3/4"	3.25"	8.78"
7.5...75.	1"	3.50"	8.90"
15..150	1-1/2"	4.50"	9.17"
30...300	2"	5.25"	9.33"

**Flange Models**

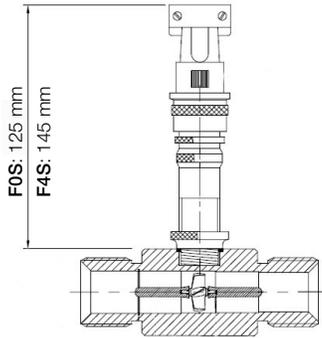


Flow (GPM)	ANSI Flanged Connection	A	H
0.5...5	1/2"	5.00"	8.62"
1...10	3/4"	5.00"	8.62"
1.8...18	3/4"	5.00"	8.62"
3.6...36	3/4"	5.50"	8.74"
7.5...75	1"	6.00"	8.98"
15...150	1-1/2"	7.00"	9.09"
30...300	2"	7.75"	9.33"
60...600	3"	10.00"	9.80"
120...1200	4"	14.00"	10.55"
240...2400	6"	14.50"	11.73"

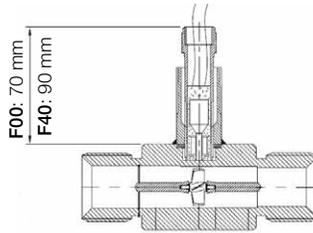


**Dimensions**

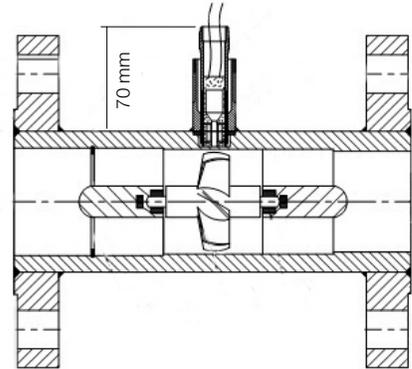
**F0S/F4S with MS Connector**



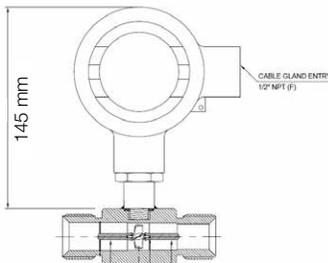
**F00/F40 Threaded Flying Leads**



**F00 Flange with Flying Leads**



**L0N Threaded with Junction Box**



**L0N Flange with Junction Box**

