

2" MINI

GAS TURBINE METER

Small

Lightweight

Versatile

**High resolution, repeatability,
and rangeability**

All stainless steel

**High temperature and
pressure ratings**



Use with Daniel battery powered Model 2703 rate indicator and totalizer, Solarflow-Plus or Model 2500 RTU, or other electronic readout device.

MODEL 3000

DANIEL

Flow Products, Inc.

2" Mini Gas Turbine Meter

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Product Features

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Need a totalizer for your turbine meter? Try the [MRT-94](#) totalizer!

Product Overview and Specifications

MRT 94 FLOW RATE INDICATOR/TOTALIZER

- For Gas and Liquid Turbine Meters



Description

Featuring 4 1/2 digits of rate and 8 digits of total, the MRT 94 is a battery powered indicator capable of accepting magnetic pickup, DC pulse and switch closure inputs. The unit can be ordered with an optional 4-20mA output. The MRT 94 uses the 4-20mA loop to provide power when this output is used.

POWER:

BATTERY POWERED

- Supplied with 2 C Size Lithium battery pack

LOOP POWERED

- Voltage: 8.5 to 30 VDC

- Supplied with 2 C size lithium battery
- Protection: Reverse Polarity Protection on Current Loop
- Loop Burden: 8.5V maximum

BATTERY LIFE EXPECTANCY

UTILIZATION	RUN TIME			
	Idle	2hrs/day	8hrs/day	24 hrs/day
RATE, TOTAL, PULSE OUT	5 yrs	4.5 yrs	3.5 yrs	2.1 yrs
RATE, TOTAL, PULSE OUT 10 PT LINEARIZATION	5 yrs	3.7 yrs	2.7 yrs	1.5 yrs
RATE, TOTAL, PULSE OUT 10 PT LINEARIZATION 4-20 mA LOOP POWERED	10 years			

All of the above values are calculated with the pulse output ON. Turn the pulse output OFF to prolong battery life up to 30%.

DISPLAY:

Rate Display: (selectable decimal)

- 4.5 Digits (19999), 0.35" High, Display updates once every two seconds
- Rate Descriptors: /SEC, /MIN, /HR
- Min. Input Frequency: .125 Hz to 10 Hz (selectable delay of 0.1 to 8.0 seconds)

Totalizer Display: (selectable decimal)

- 8 Digits (99999999), 0.2" High
- Totalizer Descriptors: GAL, BBL, MCF, M3, "blank"

Warning Displays: Low battery warning

PULSE OUTPUT:

The pulse output advances with the least significant digit of the totalizer.

Type: Opto-isolated open collector transistor

- Max. voltage (off state): 30 VDC
- Current (on state): 5 mA @ .9V drop, .1mA @ .7V drop
- Pulse Duration: 32 msec
- Pulse Output Rate: 10 CPS max

Pulse output divider: User selectable,)1,)10,)100 or OFF
NOTE: Select OFF for max. battery life.

ENCLOSURE:

Explosion Proof: Class I, Division I, Groups B, C & D
Class II, Division I, Groups E, F & G

ENVIRONMENTAL:

OPERATING TEMPERATURE
-22°F (-30°C) to +158°F (70°C)

HUMIDITY
0 - 90% Noncondensing

INPUTS:

MAGNETIC PICKUP INPUT

- Frequency Range: 0 to 3500 Hz
- Trigger Sensitivity: 30 mV p-p
- Over Voltage Protected: "30 VDC

OPTO-ISOLATED DC PULSE INPUT

- High (logic 1): 4-30 VDC
- Low (logic 0): Less Than 1 VDC
- Minimum Current: .5 mA
- Hysteresis: 0.4 VDC
- Frequency Range: 0 to 5 kHz
- Min. Pulse Width: 0.1 msec

CONTACT CLOSURE INPUT (contact closure to common)

- Internal Pullup Resistor: 100 KW to +3.6 VDC
- High (logic 1): Open or 4-30 VDC
- Low (logic 0): Less than .5 VDC
- Internal Switch Debounce Filter: 0 to 40 Hz

Caution: Sustained contact closure will shorten battery life.

RESET INPUT (contact closure to common)

- Internal Pullup Resistor: 100 KW to +3.6 VDC
- High (logic 1): Open or 4-30 VDC
- Low (logic 0): Less than .5 VDC
- Minimum On: 25 msec

Caution: Sustained contact closure will shorten battery life.

K-FACTOR

- Range: 0.001 to 59999
- Decimal Point Locations: XX.XXX to XXXXX

10 Point Linearization Option

- This feature allows the user to enter 10 different frequencies with 10 different corresponding K-Factors to linearize non-linear signals.

ANALOG OUTPUT OPTION:

Type: 4-20 mA follows rate display. Two wire hookup.

Accuracy: 0.15% Full Scale at 20°C

Temperature Drift:

50 ppm/°C Typical

200 ppm/°C Worst Case

Reverse Polarity Protected

NOTE: The MRT 94 uses the 4-20 mA loop power as its power source when this option is used.

***A large delay setting and internal math operations may delay the update rate.**

Applications



Use the new Mini Gas Turbine Meter for such applications as replacing large, obsolete meters (the PD meter shown, for example, formerly at a major integrated gas company's pipeline takeoff for distribution to industrial end users), measuring coal-seam gas, monitoring fuel stacks for EPA compliance, or any other place where a small gas turbine meter with specifications as tight as the Daniel unit is required and where its cost-effective use is appropriate.

Nomenclature/Ordering Information

30 0 1

Code	Explanation/Example
30	Product Number
0	Flange Facing 0 Flat Face
1	ANSI Rating 1 Class 150 3 Class 300 5 Class 600

INSTALLATION KITS AVAILABLE.



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Specifications

FLOW-RATE RANGE:

(Rangeability increases with line pressure and for gases with specific gravity of more than 0.6)

GAS TURBINE METER FLOW RANGE

(Natural Gas, 0.6 specific gravity)

PRES (psig)	FLOW RATE (SCFH)	FLOW RATE (SCFH)	RANGEABILITY	RANGEABILITY
	Maximum	Minimum	±1%	±0.5%
0.25	6,000	600	10.0:1	8.0:1
1	6,400	622	10.3:1	8.7:1
10	10,083	890	11.3:1	10.0:1
35	20,290	1,400	14.5:1	11.3:1
50	26,414	1,621	16.3:1	12.2:1
75	36,621	1,934	18.9:1	13.8:1
100	46,827	2,213	21.2:1	15.2:1
125	57,034	2,471	23.1:1	16.4:1
150	67,241	2,715	24.8:1	17.5:1
200	87,655	3,172	27.6:1	19.4:1
250	108,069	3,596	30.1:1	21.0:1
300	128,482	3,991	32.2:1	22.4:1
350	148,896	4,360	34.2:1	23.7:1
400	169,310	4,703	36.0:1	25.0:1
450	189,723	5,021	37.8:1	26.2:1
500	210,137	5,314	39.5:1	27.4:1
550	230,551	5,583	41.3:1	28.6:1
600	250,965	5,828	43.1:1	29.9:1
650	271,378	6,049	44.9:1	31.1:1
700	291,792	6,246	46.7:1	32.4:1
750	312,206	6,420	48.6:1	33.8:1
800	332,619	6,569	50.6:1	35.2:1
850	353,033	6,695	52.7:1	36.7:1
900	373,447	6,797	54.9:1	38.3:1
950	393,861	6,876	57.3:1	40.0:1

1,000	414,274	6,930	59.8:1	41.8:1
1,050	434,688	6,961	62.4:1	43.7:1
1,100	455,102	6,969	65.3:1	45.8:1
1,150	475,516	6,982	68.1:1	48.1:1
1,200	495,929	7,167	69.2:1	50.5:1
1,250	516,343	7,252	71.2:1	53.2:1
1,300	536,757	7,352	73.0:1	56.2:1
1,350	557,170	7,429	75.0:1	59.5:1
1,400	577,584	7,701	75.0:1	66.1:1
1,440	593,915	7,919	75.0:1	66.4:1

RANGEABILITY: $\pm 0.05\%$ of the flow rate

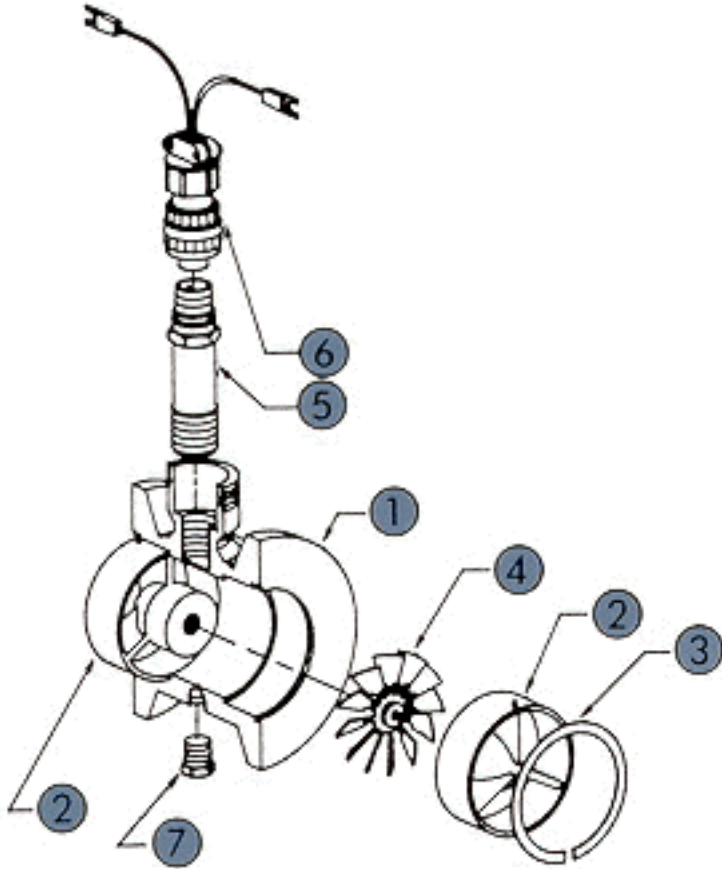
k FACTOR: .2350 pulses/ACF

MAXIMUM OUTPUT FREQUENCY: 3850 Hz

MAXIMUM WORKING PRESSURE: 1440 psig (All Stainless Steel)

WORKING TEMPERATURES: -50° TO 150°F (Preamp must be remotely located for operating temperature above 150°F; upper limit 225°F with preamp mounted remotely.)

Parts List and Diagram



ITEM	DESCRIPTION
1	Meter Body
2	Flow Diffuser
3	Retaining Ring
4	Rotor Shaft Ass'y
5	Pickup Coil
6	Coil Cable Ass'y
7	Pipe Plug