M-10000 Paddle Wheel Flow Meter

Feature rich flow meter and switch with in-line flow

PSG
a DOVER company

MALEMA

Where Innovation Flows

MALEMA

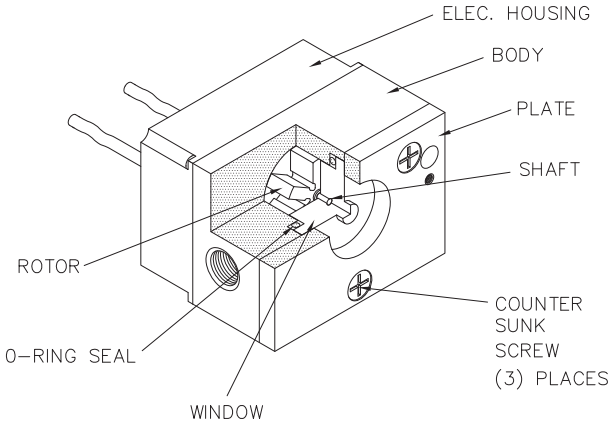
Tangential turbine flow meters continue to be the most common way to measure flow electronically in a wide range of industries. Enhancements to tangential turbine flow meter systems are producing a flow sensing device that is smaller, easier to install and more accurate than ever before.

Operation

The rotational velocity of the rotary wheel varies linearly with the average velocity of the fluid flowing through the flow meter. Producing a square wave pulse from magnets embedded in the vanes of the rotor wheel. Depending on the output version of the M-10000, the pulse signal is relayed directly, converted to a 0-10 VDC (voltage) output or a 4-20 mA (current) output. The voltage and current models are span adjustable over the flow range of the unit.

Applications

- Cooling systems
- Laser equipment
- Wet process systems
- CVD, CMP, and lithography tools
- Corrosive chemical distribution



Key Features

- Wide flow rangeability
- Outstanding accuracy
- State-of-the-art electronics - high reliability
- 4-20 mA, 0-10 VDC, or pulse output
- Visual indication
- Adjustable flow switch - built in
- Small footprint

M-10000 in 316SS

M-10000 in Celcon®

Installation

The M-10000 Rotary Flow meter may be installed horizontally or vertically, but axis of the rotor should be parallel to the ground.

Specifications

M-10000 Operating Ranges	1/4" FNPT	0.1 - 1 l/min, 0.3 - 31/min, 0.5 - 5 l/min
	3/8" FNPT	1 - 10 l/min, 2 - 20 l/min, 3 - 30 l/min
	1/2" FNPT	4 - 40 l/min, 5 - 50 l/min
	3/4" FNPT	20 - 115 l/min
	1" FNPT	38 - 225 l/min
Set Point Accuracy	± 5% maximum	
Repeatability	0.5%	
Mounting	Horizontal or vertical mounting; axis of rotor should be parallel to the ground	
Material Versions	• Celcon® • 316 Stainless Steel	

Standard Component Materials

Body	Celcon	316SS
Rotor	Composite PPS	Composite PPS
Shaft	Zirconium Ceramic	Zirconium Ceramic
Window	Polycarbonate	316SS
Bushings	N/A	N/A
O-Ring	FKM	FKM
FacePlate	PPS	PPS

Physical Specifications

Body		Celcon	316SS
Maximum Operating pressure (for standard units)*		100 psi	200*psi
Weight	1/4" and 1/2" ports	~0.8 lbs	~1.5 lbs
	3/4" and 1" ports	~1.5 lbs	~ 6.4 lbs
Viscosity		Up to 120 cenststokes (~ 30 weight oil)	
Pressure Drop		Contact Factory	
Fluid temperature		Upto 90 Deg C	

Electrical Specification

Power Supply	Voltage Version	12 to 24 VDC+10%	
	Current Version	24 VDC+10%	
	Pulse Train	3.8 VD C to 24 VDC	
Current Draw	50 mA maximum		
Temperature	60 Deg C*		
Electrical Connection	2 Belden Cables(2-wire and 5-wire cables)		
	Voltage Version	2-wire cable	Red:12 to 24 VDC Black: ground
		5-wire cable	Green: Normally open Brown: Normally closed White: Relay common Red: Analog signal output Black: Signal ground (power and signal ground are common)
	Current Version	2-wire cable	Red: 24 VDC +10% Black: Ground
		5-wire cable	Green: Normally open Brown: Normally closed White: Relay common Red: 4 - 20 mA analog output signal Black: 4 - 20 mA signal ground (power and singal-ground are NOT common)
	1 Belden Cable (3 - wire cables)		
	Pulse Train	3-wire cable	Red: 3.8 VD C to 24 VDC Black: Ground (power and signal ground are comm on) Green:Signal
SPDT Relay (Available with Current or Voltage Output version only)	* Contacts rated at 30 VDC, 2 amps resistive load. * Nominal switching capacity (resistive): 2A, 30 VDC * UL/CSA rating (up to 24 V coil type): 2A, 20 VDC; 0.3A, 110 VDC; or 0.5A, 125 VAC		

* Select Remote electronics for fluid temperature beyond 60° C

Signal Outputs

Voltage Version	0 - 10 VDC analog output.
Current Version:	4 - 20 mA maximum external load: 1K ohm.
Pulse Version:	0 - 120 Hz square wave pulse train. Signal amplitude is equal to supply voltage.

Port / Range Combinations

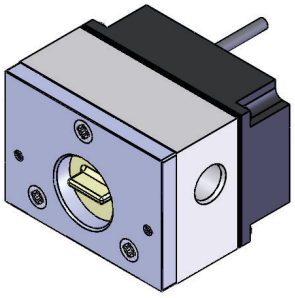
Port Size	Range code for LPM	Range LPM	Range code for GPM	Range GPM
1/4"	01	0.1 - 1.0	11	0.026 - 0.26
1/4"	02	0.3 - 3.0	12	0.08 - 0.8
1/4"	03	0.5 - 5.0	13	0.13 - 1.3
3/8"	04	1.0 - 10.0	14	0.26 - 2.6
3/8"	05	2.0 - 20.0	15	0.52 - 5.2
3/8"	06	3.0 - 30.0	16	0.8 - 8.0
1/2"	07	4.0 - 40.0	17	1.0 - 10.0
1/2"	08	5.0 - 50.0	18	1.3 - 13.0
3/4"	09	20.0 - 115.0	19	5.0 - 30.0
1"	10	38.0 - 225.0	10	10.0 - 60.0

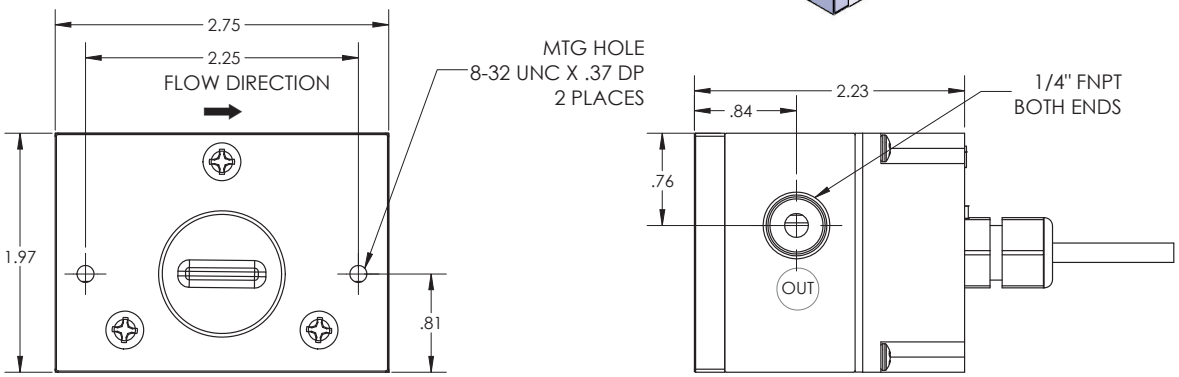
Certifications

CE Compliance
As per EU directive 2014/30/EU

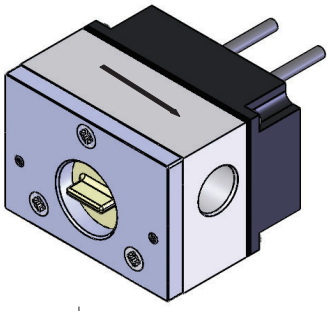
Dimensional Drawings

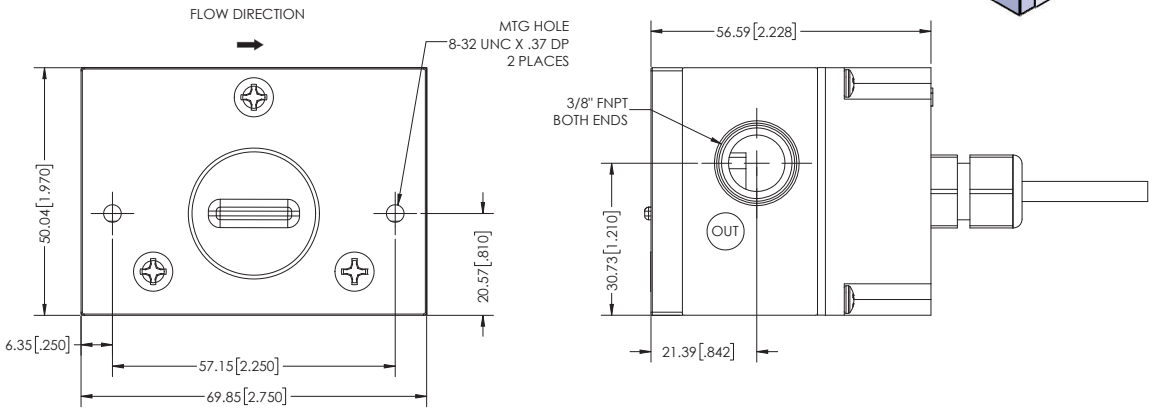
Illustrated is the M-10000 model with 1/4" ports



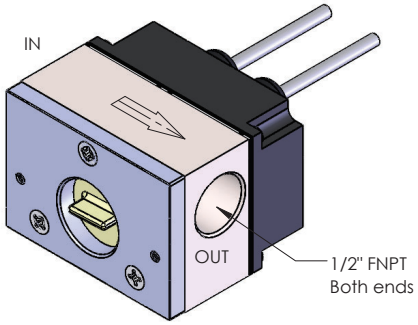


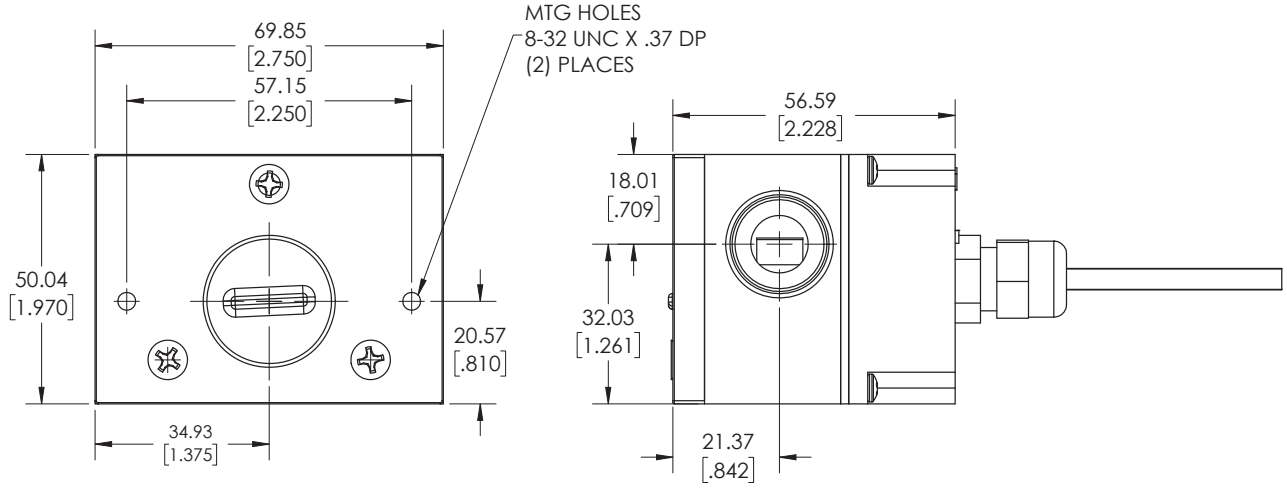
Illustrated is the M-10000 with 3/8" ports





Illustrated is the M-10000 with 1/2" ports





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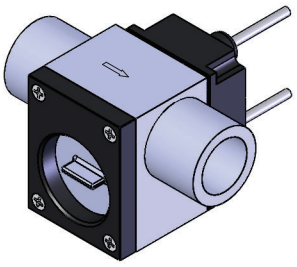
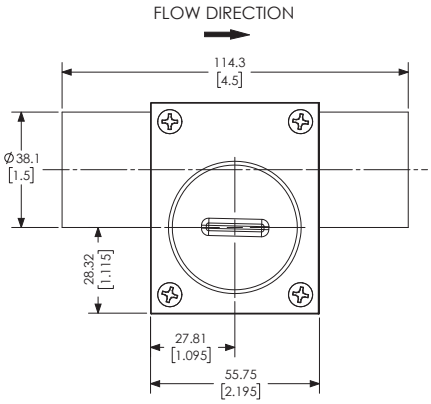
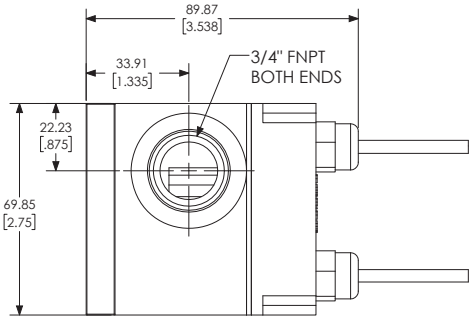
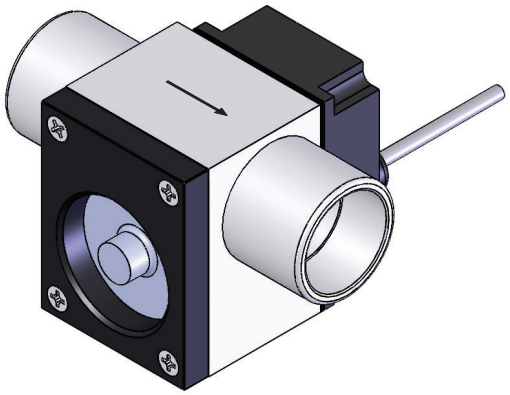
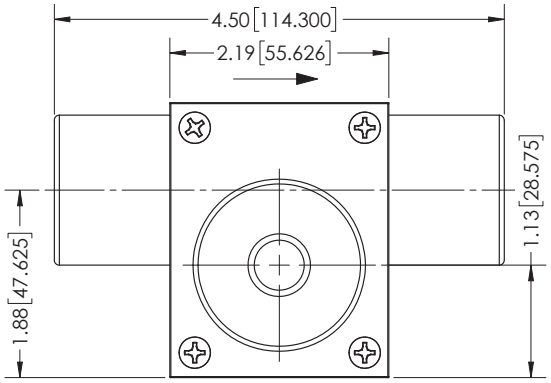


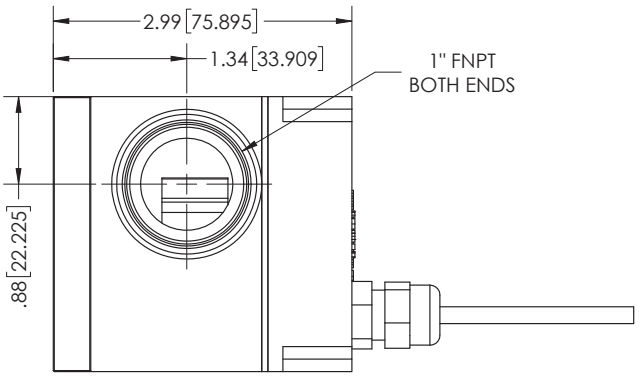




Illustrated is the M-10000 with 1" ports







Ordering Information

Part numbers for SS and Celcon M-10000													
M	-	10000	-	Body	Fluid Connection	Range Code, Flow Range and Connection	Output	-	Window	O-ring	Rotor	Shaft	Faceplate
M	-	10000											
			-										
				S-SS316	2- 1/4" FNPT								
					3- 3/8" FNPT								
					4- 1/2" FNPT								
					6- 3/4" FNPT								
					8- 1" FNPT								
				C-Celcon	2- 1/4" FNPT								
					3- 3/8" FNPT								
					4- 1/2" FNPT								
					6- 3/4" FNPT								
					8- 1" FNPT								
						01 -0.1 -1 l/m (1/4" FNPT)							
						02 -0.3 -3 l/m (1/4" FNPT)							
						03 -0.5 -5 l/m (1/4" FNPT)							
						04 -1 -10 l/m (3/8" FNPT)							
						05 -2 -20 l/m (3/8" FNPT)							
						06 -3 -30 l/m (3/8" FNPT)							
						07 -4 -40 l/m (1/2" FNPT)							
						08 -5 -50 l/m (1/2" FNPT)							
						09 -20 -115 l/m (3/4" FNPT)							
						10 -38 -225 l/m (1" FNPT)							
						11 - 0.026-0.26 GPM (1/4" FNPT)							
						12- 0.08-0.8 GPM (1/4" FNPT)							
						13- 0.13-1.3 GPM (1/4" FNPT)							
						14- 0.26-2.6 GPM (3/8" FNPT)							
						15- 0.52-5.2 GPM (3/8" FNPT)							
						16- 0.8-8.0 GPM (3/8" FNPT)							
						17- 1.0-10.0 GPM (1/2" FNPT)							
						18- 1.3- 13.0 GPM (1/2" FNPT)							
						19- 5.0-30.0 GPM (3/4" FNPT)							
						20- 10.0-60.0 GPM (1" FNPT)							
							1- Voltage (0-10Vdc)+ Relay O/P						
							2-Current (4-20mA)+ Relay O/P						
							3- Pulse O/P						
								-					
									P- Polycarbonate				
									S- SS 316				
										V- FKM			
										K- FFKM			
											P- PPS		
											T-PTFE		
												Z-Zirconium	
												S- Sapphire	
													P- PPS
	Example: Part number for M-10000 with SS316 Body, 1/4" FNPT connection, 0.1-1 l/m range, Current output, SS 316 window, FKM O-ring, PPS rotor, Zirconium shaft, and PPS faceplate is: M-10000-S2012-SVPZP												
M	-	10000	-	S	2	01	2	-	S	V	P	Z	P

Note:
- Pressure and temperature rating mentioned in the datasheet is for M-10000 with SS 316 body, SS 316 Window and PPS face plate
- For flow meter with 4-20mA output, 4mA will always be 0 flow and 20mA will be the maximum flow listed in the above table. Example for the flow meter with 0.1-1 L/M raange 4mA=0 L/M and 20mA = 1 L/M
- For flow meter with 0-10V output, 0V will always be 0 flow and 10V will be the maximum flow listed in the above table. Example for the flow meter with 0.1-1 L/M raange 0V=0 L/M and 10V = 1 L/M
- For the flow meter with Pulse output, the pulse rate corresponding to the flow will be printed on the label of the flow meter
- Please contact the factory for any special requirements.

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