

## 1/4" High Precision Flow Meter

V 2.0

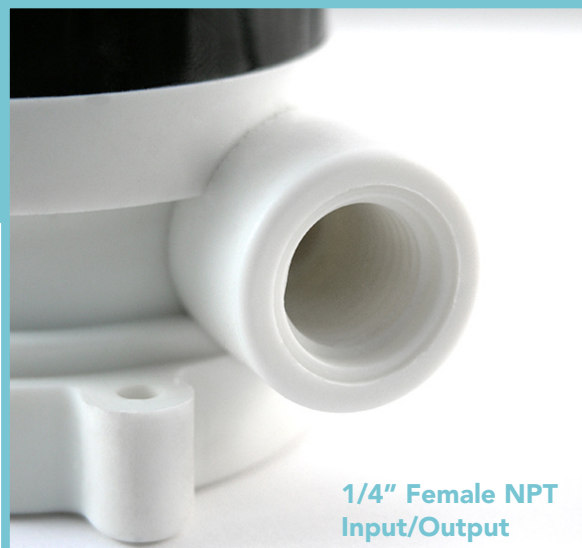
### Features

- High accuracy Flow Meter (+/- 5%)
- See through front panel for visual inspection
- Minimum flow rate 378 mL / min (0.1 GPM)
- Maximum flow rate 19 L / min (5 GPM)
- Max operating pressure 689 KPA (100 PSI)
- Weighs 101.5g
- Operating temperature
- -29° C to 82° C (-20° F to 180° F)
- Max viscosity 200 ssu
- 3 lead cable 71.1cm (28") long
- Food safe
- Diesel safe
- Kerosene safe
- Gasoline safe

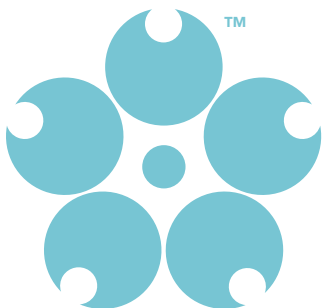


### Materials

**Body:** Polypropylene  
**Rotor Pin:** Ceramic  
**Paddle Wheel:** Polypropylene Sulfide  
**Front Panel:** Polysulfone  
**O-ring:** Buna-N



1/4" Female NPT  
Input/Output



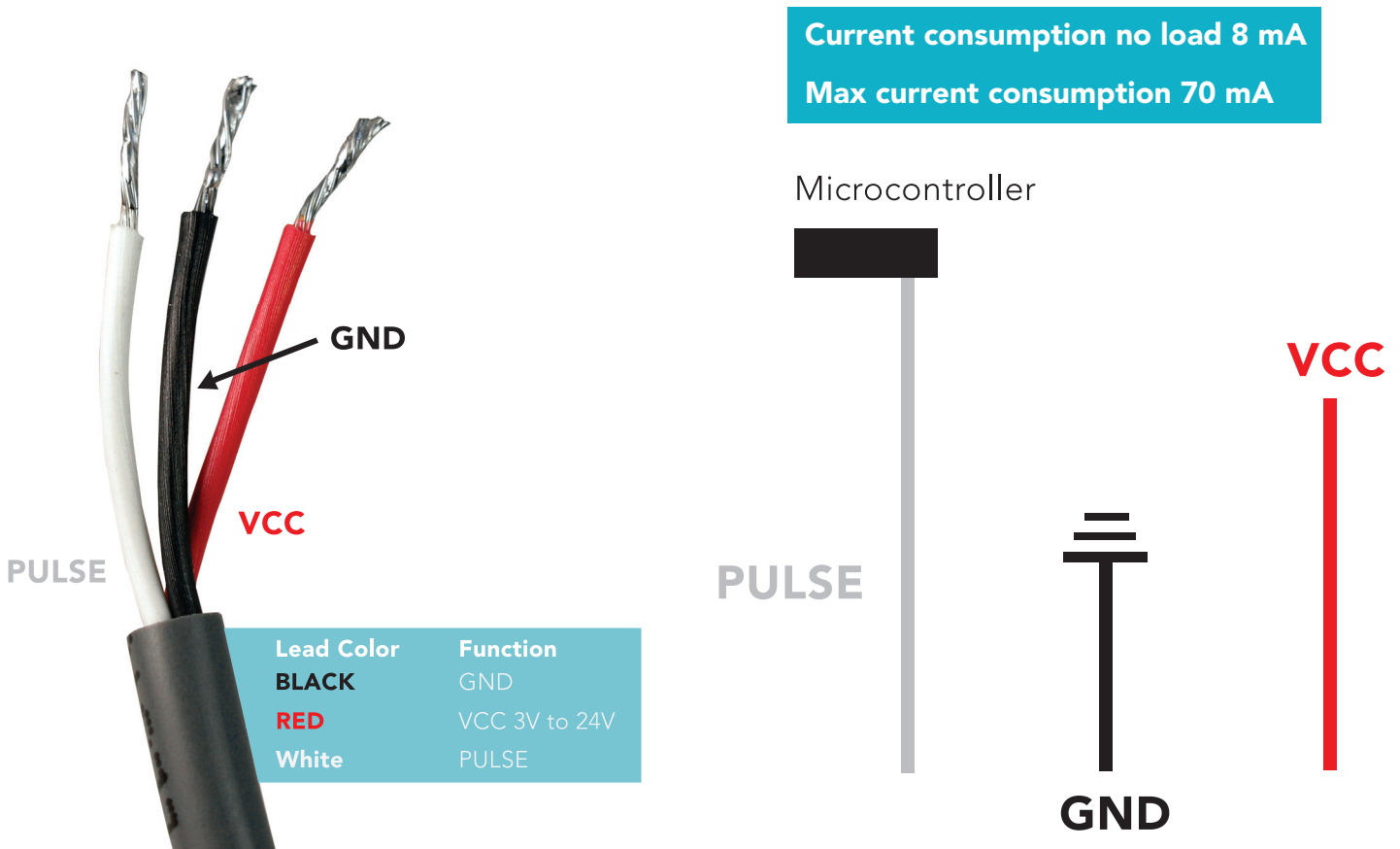
## Description

The 1/4" Paddel Wheel Flow Meter is an extremely accurate flow meter of moderate complexity. This flow meter requires specific timing and calculations to provide meaningful data, all of which is described in this datasheet.

The 1/4" Flow Meter provides the user with extremely reliable readings for flow rates from 378 mL/min (0.1GPM) up to 19 L / min (5 GPM).

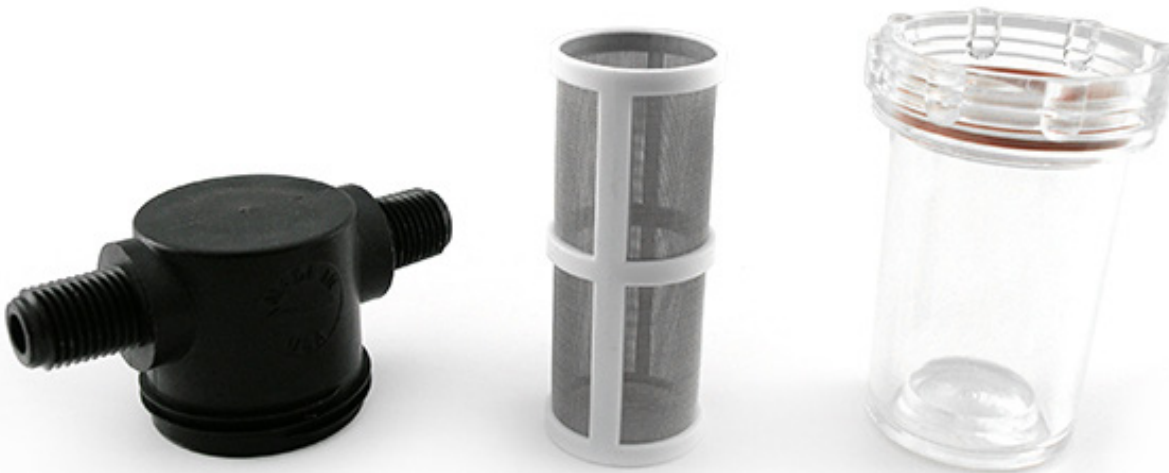
## Wiring

The 1/4" Flow Meter has an 71.1 (28") cable, that terminates with three tinned leads.



## Pre-filter requirements

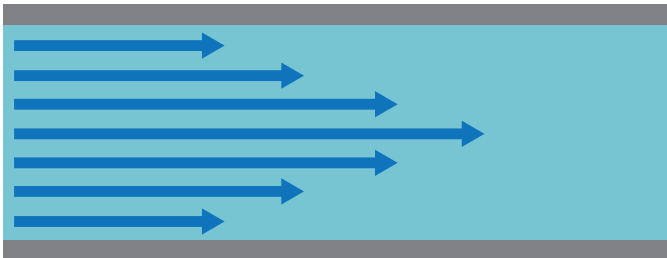
If water with particulate matter will be passing through the flow meter a pre-filter of at least 80 microns must be used. Not using a pre-filter can cause the paddle wheel blades to become jammed. Jammed paddle wheel blades will not damage the flow meter however, it will not be possible to get accurate flow readings until the blockage has been cleared.



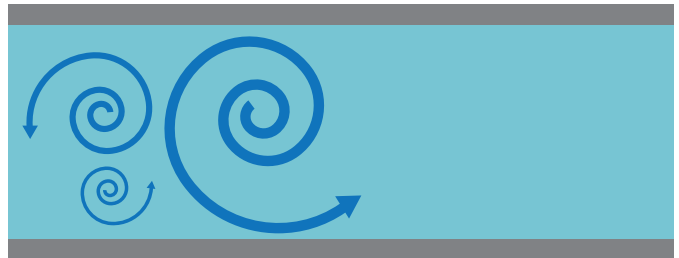
## Laminar flow

Laminar flow can be thought of as the opposite of turbulent flow. In order for the flow meter to work properly liquid entering the flow meter should have a streamlined laminar flow. Achieving laminar flow is not hard to do. Simply allow for 20cm (8") of straight pipe just before the liquid enters the flow meter.

Turbulent liquid entering the flow meter can cause inaccuracies in flow rate monitoring.



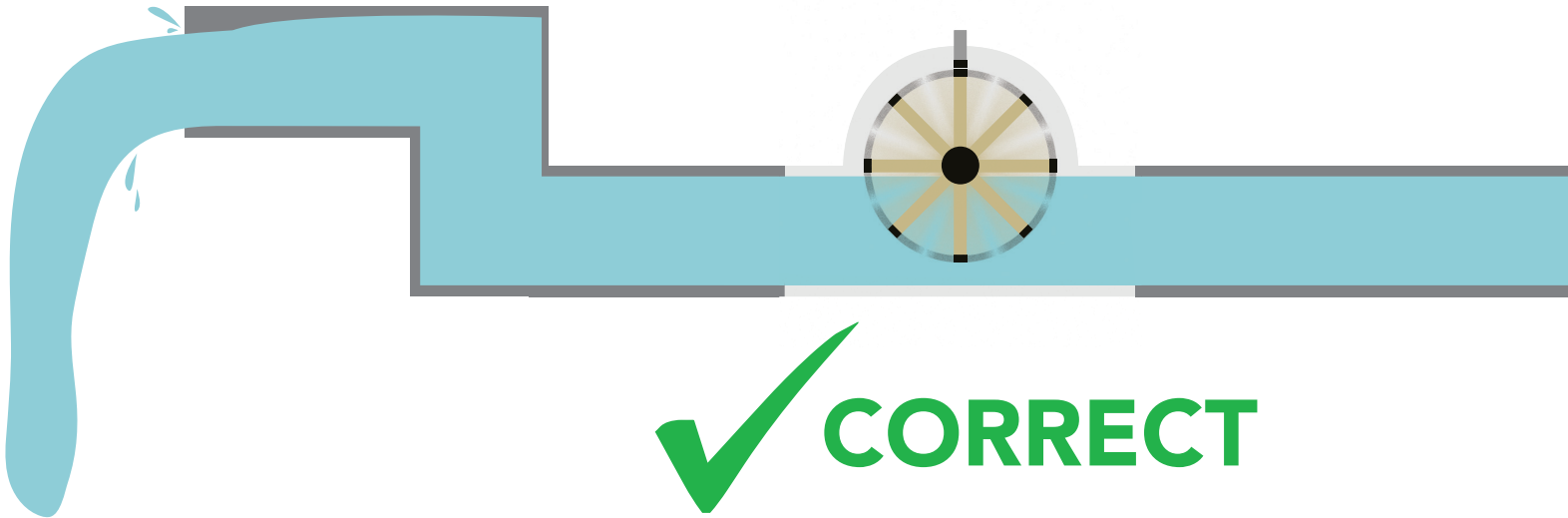
Laminar flow



Turbulent flow

## Liquid exiting the flow meter

Liquid should not be permitted to simply fall out of the flow meter. This would let air enter the device and lead to inaccurate readings.



## Low flow adapter

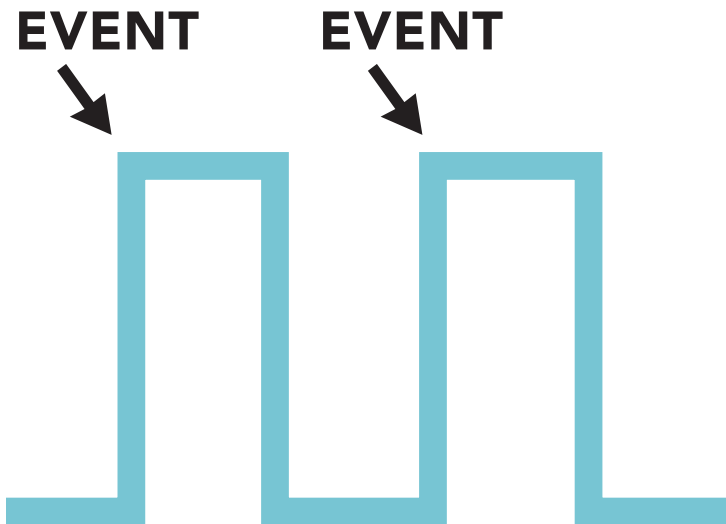
For flow rates between 378 mL/min to 1L/min a low flow adapter should be inserted into the input side of the flow meter. **Low flow adapter is supplied with this flowmeter.**



**Insert low flow adapter on INPUT side of flow meter.**

## Data output

The white lead from the 1/4" flow meter will output a square wave frequency from 0 – 200+ Hz. The amplitude of the frequency will always equal VCC. A single pulse is a rising edge followed by a falling edge.



The amount of liquid moving through the flow meter is quantified by the frequency that the flow meter outputs. This is known as the flow meters K-factor.

**A single pulse does not represent a fixed volume a liquid.**

## K-factor

1/4" flow meter with low flow adapter installed

GPM	LPM	Output Frequency – Hz
0.1	0.38	13
0.25	0.95	41
0.5	1.9	90
0.75	2.85	137
1	3.8	186

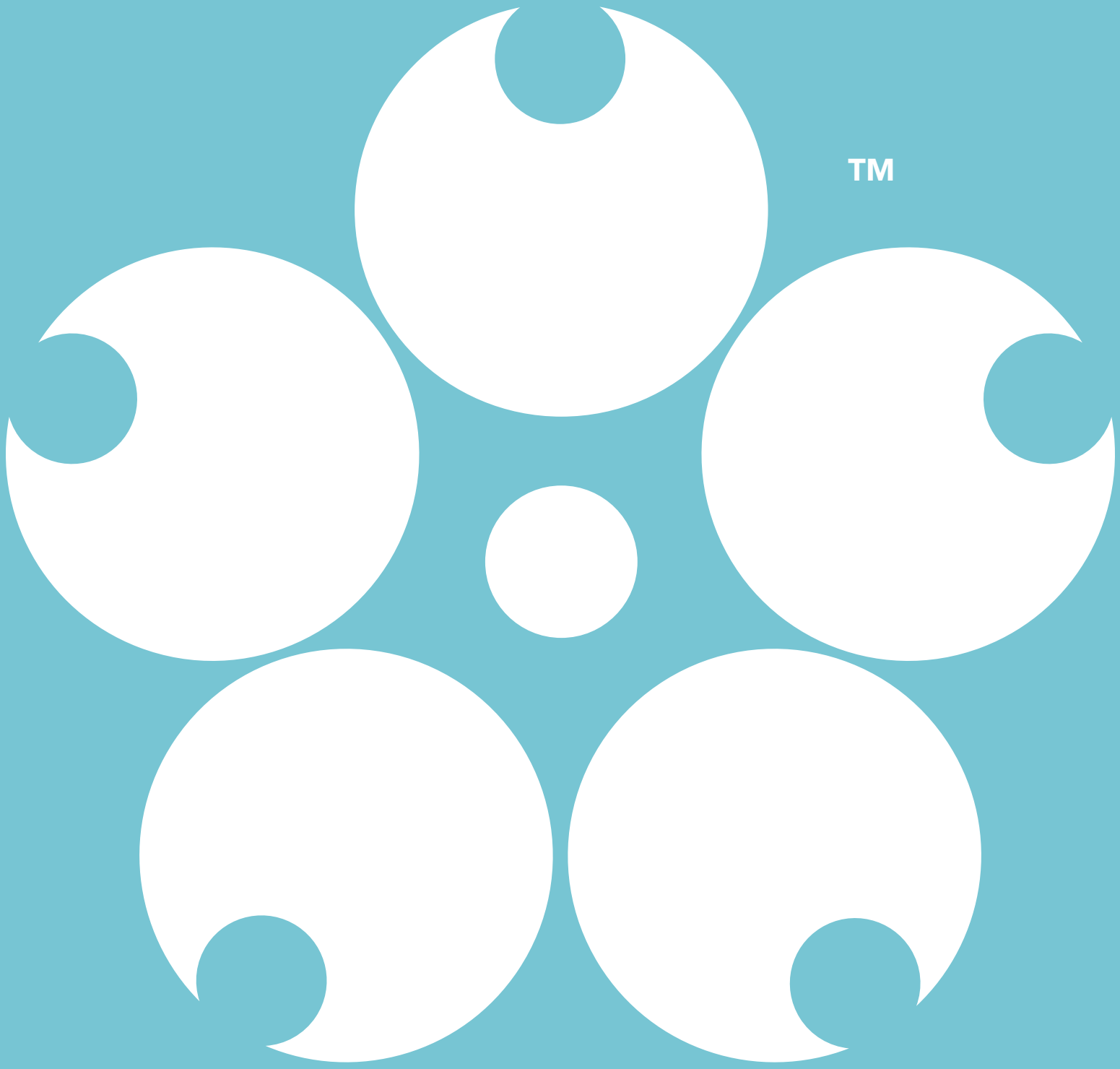
$$\text{LPM} = 0.0198 \times [\text{Hz}] + 0.1298$$

## K-factor

1/4" flow meter without low flow adapter installed

GPM	LPM	Output Frequency – Hz
0.5	1.9	15
1	3.8	34
1.5	5.7	54
2	7.6	73
2.5	9.5	90
3	11.4	110
3.5	13.3	128
4	15.2	148
4.5	17.1	168
5	19	185

$$\text{LPM} = 0.1004 \times [\text{Hz}] + 0.3633$$



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