

## BW Digi-Meter F-1000

F-1000 Series paddle wheel flow meters provide the performance and features of electronic meters, without the need for an external electricity supply. A large range of installation tees and saddles enables the meter to be fitted on pipe sizes up to 12"/315mm.

Ideal for use with water and mildly corrosive liquids.



### Main Features

- Factory calibrated
- 6 digit LCD, up to 4 decimal places.
- Display & update time: every 2 seconds
- Battery operated (2 batteries alkaline AAA)
- Suitable for outdoor installations
- Total reset function can be disabled
- Tamper proof
- Installs quickly on existing pipe
- Available sizes 1 1/2" - 12" / 20mm - 315mm
- Can be mounted horizontally or vertically
- Minimal maintenance required
- Custom calibration available

Three versions of this digital flowmeter are available:

#### F-1000RB

Rate of flow display

#### F-1000TB

Total flow display

#### F-1000RT

Rate & total display

### Specifications

Accuracy: +/- 2% full scale  
 Repeatability: +/- 1% full scale  
 Display: 6-digit LCD, rate and total  
 Max pressure: (20bar) @ 20°C  
 Max fluid temp @ 0 psi: 60°C  
 Max ambient temperature: -10° to +43°C  
 Minimal pressure drop  
 Calibration units: LPM, m3/min, LPH

#### Materials:

Sensor body/paddle/axle: PVDF  
 Mounting tee: Polypropylene, PVCu  
 Mounting saddle: 1 1/2" to 3": PVDF, 6" to 10": PVC  
 Sensor O-Rings: Viton®  
 Power: Two AAA batteries (included)  
 Battery life: 1 year minimum  
 Enclosure: NEMA 4X, (IP56), ABS



**BW Digi-Meter F-1000  
Polypropylene Body Male BSP**

Pipe Size M/NPT	LPM Range	Rate Only Model Number	Total Only Model Number	Rate & Total Model Number
3/8"	3 to 30	RB-375MB1-LPM1	TB-375MB1-LPM1	RT-375MB1-LPM1
3/8"	1 to 10	RB-375MB1-LPM2	TB-375MB1-LPM2	RT-375MB1-LPM2
1/2"	7 to 70	RB-500MB1-LPM1	TB-500MB1-LPM1	RT-500MB1-LPM1
1/2"	2 to 20	RB-500MB1-LPM2	TB-500MB1-LPM2	RT-500MB1-LPM2
3/4"	11 to 110	RB-750MB1-LPM1	TB-750MB1-LPM1	RT-750MB1-LPM1
3/4"	3 to 30	RB-750MB1-LPM2	TB-750MB1-LPM2	RT-750MB1-LPM2
1"	20 to 200	RB-100MB1-LPM1	TB-100MB1-LPM1	RT-100MB1-LPM1
1"	7 to 70	RB-100MB1-LPM2	TB-100MB1-LPM2	RT-100MB1-LPM2
1 1/2"	15 to 150	RB-150MB1-LPM1	TB-150MB1-LPM1	RT-150MB1-LPM1
1 1/2"	25 to 250	RB-150MB1-LPM2	TB-150MB1-LPM2	RT-150MB1-LPM2
1 1/2"	40 to 400	RB-150MB1-LPM3	TB-150MB1-LPM3	RT-150MB1-LPM3
2"	15 to 150	RB-200MB1-LPM1	TB-200MB1-LPM1	RT-200MB1-LPM1
2"	25 to 250	RB-200MB1-LPM2	TB-200MB1-LPM2	RT-200MB1-LPM2
2"	40 to 400	RB-200MB1-LPM3	TB-200MB1-LPM3	RT-200MB1-LPM3
2"	70 to 700	RB-200MB1-LPM4	TB-200MB1-LPM4	RT-200MB1-LPM4

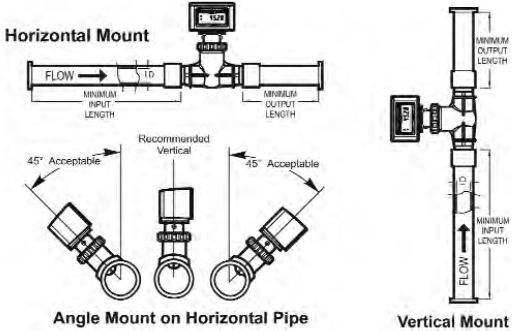


**Installation Requirements:**

**Minimum Straight Pipe Length Requirements**

The meter's accuracy is affected by disturbances such as pumps, elbows, tees, valves etc., in the flow stream. Install the meter in a straight run of pipe as far as possible from any disturbances. The distance required for accuracy will depend on the type of disturbance.

Type of Disturbance	Minimum Inlet Pipe Length	Minimum Outlet Pipe Length
Flange	10 x Pipe I.D.	5 x Pipe I.D.
Reducer	15 x Pipe I.D.	5 x Pipe I.D.
90° Elbow	20 x Pipe I.D.	5 x Pipe I.D.
Two Elbows - 1 Direction	25 x Pipe I.D.	5 x Pipe I.D.
Two Elbows - 2 Directions	40 x Pipe I.D.	5 x Pipe I.D.
Pump or Gate Valves	50 x Pipe I.D.	5 x Pipe I.D.



**Mounting Location**

- The meter is designed to withstand outdoor conditions. A cool, dry location, where the unit can be easily serviced is recommended.
- The meter can be mounted on horizontal or vertical runs of pipe. Mounting at the vertical (twelve o'clock) position on horizontal pipe is recommended. Mounting anywhere around the diameter of vertical pipe is acceptable, however, the pipe must be completely full of water at all times. Back pressure is essential on downward flows. See the minimum straight length of pipe requirement chart above.
- The meter can accurately measure flow from either direction.

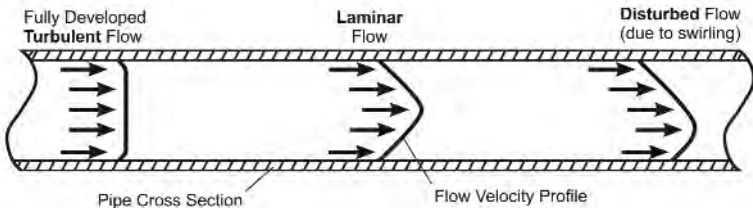
**Flow Stream Requirements:**

Measuring accuracy requires a fully developed *turbulent* flow profile. Pulsating, swirling and other disruptions in the flow stream will effect accuracy. Flow conditions with a *Reynolds Number* greater than 4000 will result in a fully developed *turbulent* flow. A Reynolds Number less than 2000 is *laminar* flow and may result in inaccurate readings.

**REYNOLDS NUMBER EQUATION:**

$$\text{REYNOLDS NUMBER} = \frac{3160 \times Q \times G}{D \times V}$$

- Where:
- Flow rate of the fluid in GPM = Q
  - Specific gravity of the fluid = G
  - Pipe inside diameter in inches = D
  - Fluid viscosity in centipoise = V



## BW Digi-Meter F-1000 PVCu Tee Solvent Socket

Pipe Size	LPM Flow Range	Rate Only Model Number	Total Only Model Number	Rate & Total Model Number
1"	25 to 250	RB-100AT-LPM1	TB-100AT-LPM1	RT-100AT-LPM1
1 1/2"	60 to 600	RB-150AT-LPM1	TB-150AT-LPM1	RT-150AT-LPM1
2"	100 to 1000	RB-200AT-LPM1	TB-200AT-LPM1	RT-200AT-LPM1

LPM Models



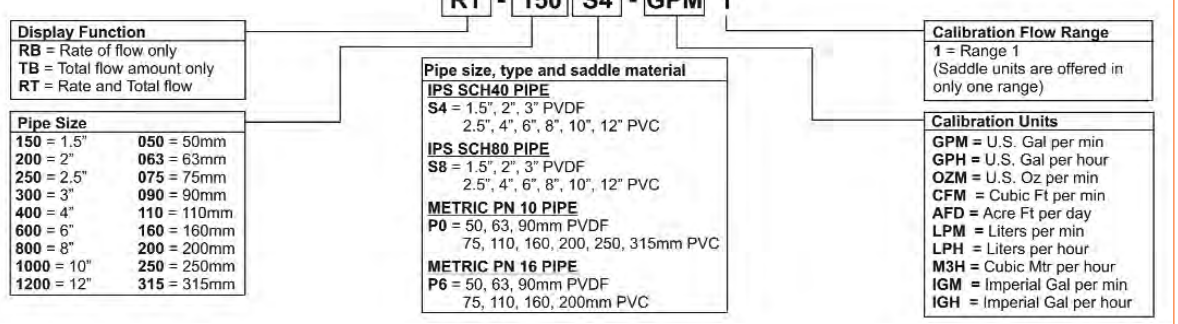
## BW Digi-Meter F-1000 PVDF & PVCu Saddle



Pipe Size	LPM Flow Range	Rate Only Model Number	Total Only Model Number	Rate & Total Model Number
50mm	70 to 700	RB-050P0-LPM1	TB-050P0-LPM1	RT-050P0-LPM1
63mm	110 to 1100	RB-063P0-LPM1	TB-063P0-LPM1	RT-063P0-LPM1
75mm	150 to 1500	RB-075P0-LPM1	TB-075P0-LPM1	RT-075P0-LPM1
90mm	230 to 2300	RB-090P0-LPM1	TB-090P0-LPM1	RT-090P0-LPM1
110mm	350 to 3500	RB-110P0-LPM1	TB-110P0-LPM1	RT-110P0-LPM1
160mm	720 to 7200	RB-160P0-LPM1	TB-160P0-LPM1	RT-160P0-LPM1
200mm	1150 to 11500	RB-200P0-LPM1	TB-200P0-LPM1	RT-200P0-LPM1
250mm	1700 to 17000	RB-250P0-LPM1	TB-250P0-LPM1	RT-250P0-LPM1
315mm	2700 to 27000	RB-315P0-LPM1	TB-315P0-LPM1	RT-315P0-LPM1

Models for METRIC PN10 Pipe (DIN 8062) display in litres per minute

### Model Number Matrix:



### BW Digi-Meter F-2000

F-2000 Series electronic insertion style flowmeters, are well suited for monitoring flow in municipal water and wastewater applications.

The clamp on saddle fitting and insertion sensor is quickly installed on imperial pipe sizes from 1½" through 12" and metric pipe sizes from 50 mm through 315 mm. The electronic display and communication enclosure can be mounted directly to the sensor, or remotely mounted to a pipe or panel.

Standard models display flow rate and accumulated total flow, and include an NPN open collector output for communication with dataloggers, SCADA systems, and other external devices.



#### Main Features

- 8 digit LCD, up to 4 decimal places.
- Display & update time: every 2 seconds.
- AC/DC Transformer or battery operated (RT models only)
- Factory programmed with calibration certificate
- Field programmable via front panel touch pad.
- Front panel security lockout.
- Total reset function can be disabled.
- Tamper proof.
- Suitable for outdoor installations.
- Installs quickly on existing pipe.
- Available pipe sizes 1½" -12"/20mm - 315mm
- Can be mounted horizontally or vertically
- Minimal Maintenance Required

Four versions of this digital flowmeter are available:

#### RT

Rate & Totalizer. Transformer or battery operated

#### AQ

4-20mA, 0-10 VDC analogue output, Rate & Totalizer. Transformer operated

#### PC

Batch Processing, flow rate alarm, proportional chemical metering, flow rate & totalizer. Transformer operated.

#### AP

Anaologue output Batch Processing, flow rate alarm, proportional chemical metering, flow rate & totalizer. Transformer operated.

#### Specifications

Accuracy: +/-1% full scale  
 Repeatability: +/- 1% full scale  
 Display: 8-digit LCD, rate and total  
 Signal Distance: AC sine wave sensor = 60m (200ft)  
 Optional Hall effect sensor = 1.6km (1 mile)  
 Max pressure: (20bar) @ 20°C  
 Max fluid temp @ 0 psi : 60°C  
 Max Ambient temperature: -10° to + 43°C  
 Minimal pressure drop  
 Calibration Units: LPM, m3/min, LPH

#### Materials:

Sensor body/paddle/axle: PVDF  
 Mounting Tee: Polypropylene, PVCu  
 Mounting saddle: 1½" to 3": PVDF, 6" to 10": PVC  
 Sensor O-Rings: Viton<sup>®</sup>  
 Power: AC/DC Transformer or battery operated (RT models only) -Two AAA batteries (included)  
 Battery life: 1-year minimum  
 Enclosure: NEMA 4X, (IP56), ABS



## BW DIGI-METER<sup>®</sup>

## BW Digi-Meter F-2000 Tee Fitting, remote mount display



Pipe Size M/NPT	LPM Flow Range	Rate & Total Display Model Number	Analog Output Model Number	Process Control Model Number
3/8"	3 to 30	RTP-238MB1-LM1	AOP-238MB1-LM1	PCP-238MB1-LM1
3/8"	1 to 10	RTP-238MB1-LM2	AOP-238MB1-LM2	PCP-238MB1-LM2
1/2"	7 to 70	RTP-250MB1-LM1	AOP-250MB1-LM1	PCP-250MB1-LM1
1/2"	2 to 20	RTP-250MB1-LM2	AOP-250MB1-LM2	PCP-250MB1-LM2
3/4"	11 to 110	RTP-275MB1-LM1	AOP-275MB1-LM1	PCP-275MB1-LM1
3/4"	3 to 30	RTP-275MB1-LM2	AOP-275MB1-LM2	PCP-275MB1-LM2
1"	20 to 200	RTP-210MB1-LM1	AOP-210MB1-LM1	PCP-210MB1-LM1
1"	7 to 70	RTP-210MB1-LM2	AOP-210MB1-LM2	PCP-210MB1-LM2
1 1/2"	15 to 150	RTP-215MB1-LM1	AOP-215MB1-LM1	PCP-215MB1-LM1
1 1/2"	25 to 250	RTP-215MB1-LM2	AOP-215MB1-LM2	PCP-215MB1-LM2
1 1/2"	40 to 400	RTP-215MB1-LM3	AOP-215MB1-LM3	PCP-215MB1-LM3
2"	15 to 150	RTP-220MB1-LM1	AOP-220MB1-LM1	PCP-220MB1-LM1
2"	25 to 250	RTP-220MB1-LM2	AOP-220MB1-LM2	PCP-220MB1-LM2
2"	40 to 400	RTP-220MB1-LM3	AOP-220MB1-LM3	PCP-220MB1-LM3
2"	70 to 700	RTP-220MB1-LM4	AOP-220MB1-LM4	PCP-220MB1-LM4

Display in litres per minute

Pipe Size M/NPT	IGM Flow Range	Rate & Total Display Model Number	Analog Output Model Number	Process Control Model Number
3/8"	0.8 to 8	RTP-238MB1-IM1	AOP-238MB1-IM1	PCP-238MB1-IM1
3/8"	0.4 to 4	RTP-238MB2-IM2	AOP-238MB2-IM2	PCP-238MB2-IM2
1/2"	2 to 20	RTP-250MB1-IM1	AOP-250MB1-IM1	PCP-250MB1-IM1
1/2"	0.5 to 5	RTP-250MB2-IM2	AOP-250MB2-IM2	PCP-250MB2-IM2
3/4"	3 to 30	RTP-275MB1-IM1	AOP-275MB1-IM1	PCP-275MB1-IM1
3/4"	0.8 to 8	RTP-275MB2-IM2	AOP-275MB2-IM2	PCP-275MB2-IM2
1"	5 to 50	RTP-210MB1-IM1	AOP-210MB1-IM1	PCP-210MB1-IM1
1"	2 to 20	RTP-210MB2-IM2	AOP-210MB2-IM2	PCP-210MB2-IM2
1 1/2"	4 to 40	RTP-215MB1-IM1	AOP-215MB1-IM1	PCP-215MB1-IM1
1 1/2"	6 to 60	RTP-215MB2-IM2	AOP-215MB2-IM2	PCP-215MB2-IM2
1 1/2"	10 to 100	RTP-215MB3-IM3	AOP-215MB3-IM3	PCP-215MB3-IM3
2"	4 to 40	RTP-220MB1-IM1	AOP-220MB1-IM1	PCP-220MB1-IM1
2"	6 to 60	RTP-220MB2-IM2	AOP-220MB2-IM2	PCP-220MB2-IM2
2"	10 to 100	RTP-220MB3-IM3	AOP-220MB3-IM3	PCP-220MB3-IM3
2"	20 to 200	RTP-220MB4-IM4	AOP-220MB4-IM4	PCP-220MB4-IM4

Display in imperial gallons per minute

### Model Number Matrix:

**RT P 2 50 MB1 GM 1**

<b>Display Function</b> RT = Rate and Total flow AO = Rate, Total, 4-20mA PC = Rate, Total, Relay AP = Rate, Total, 4-20mA, relay	<b>Display Mount / Sensor Type</b> S = Display mounted on AC coil sensor P = Display remote mount, AC coil sensor H = Display remote mount, Hall Effect sensor	<b>Power</b> B = Battery holder with 4 AA cells 1 = U.S. Transformer, AC 115V60Hz/15Vdc, NEMA5/15 plug 2 = Europe Transformer, AC 230V50Hz/15Vdc, CEE 7/11 plug 3 = U.S. Transformer, AC 230V60Hz/15Vdc, NEMA 5/15 plug 4 = U.S. Transformer, 115V60Hz and Battery back-up 5 = Europe Transformer, 230V50Hz and Battery back-up 6 = U.S. Transformer, 230V60Hz and Battery back-up X = No Selection (Customer must supply power)	<b>Pipe Size</b> 38 = 3/8 inch 50 = 1/2 inch 75 = 3/4 inch 10 = 1 inch 15 = 1-1/2 inch 20 = 2 inch	<b>Pipe Fitting type and Material</b> MB1 = PP body British BSPT, range #1 MB2 = PP body British BSPT, range #2 MB3 = PP body British BSPT, range #3 MB4 = PP body British BSPT, range #4 FB1 = PVDF body British BSPT, range #1 FB2 = PVDF body British BSPT, range #2 FB3 = PVDF body British BSPT, range #3 FB4 = PVDF body British BSPT, range #4 M1 = PP body U.S. NPT, range #1 M2 = PP body U.S. NPT, range #2 M3 = PP body U.S. NPT, range #3 M4 = PP body U.S. NPT, range #4 F1 = PVDF body U.S. NPT, range #1 F2 = PVDF body U.S. NPT, range #2 F3 = PVDF body U.S. NPT, range #3 F4 = PVDF body U.S. NPT, range #4	<b>Calibration Flow Range</b> 1 = Range 1 (see pipe data) 2 = Range 2 (see pipe data) 3 = Range 3 (see pipe data) 4 = Range 4 (see pipe data) 5 = Range 5 (see pipe data) 6 = Range 6 (see pipe data)
<b>Calibration Units</b> GM = U.S. Gal per min GH = U.S. Gal per hour OM = U.S. Oz per min FM = Cubic Ft per min AD = Acre Ft per day LM = Liters per min LH = Liters per hour MH = Cubic Mtr per hour IM = Imperial Gal per min IH = Imperial Gal per hour					

**BW Digi-Meter F-2000**  
**Saddle Fitting, remote mount display**



Pipe Size	LPM Flow Range	Rate & Total Model Number	Analog Output Model Number	Process Control Model Number
50mm	70 to 700	RTP-105K0-LM1	AOP-105K0-LM1	PCP-105K0-LM1
63mm	110 to 1100	RTP-106K0-LM1	AOP-106K0-LM1	PCP-106K0-LM1
75mm	150 to 1500	RTP-108A0-LM1	AOP-108A0-LM1	PCP-108A0-LM1
90mm	230 to 2300	RTP-109K0-LM1	AOP-109K0-LM1	PCP-109K0-LM1
110mm	350 to 3500	RTP-111A0-LM1	AOP-111A0-LM1	PCP-111A0-LM1
160mm	720 to 7200	RTP-116A0-LM1	AOP-116A0-LM1	PCP-116A0-LM1
200mm	1150 to 11500	RTP-120A0-LM1	AOP-120A0-LM1	PCP-120A0-LM1
250mm	1700 to 17000	RTP-125A0-LM1	AOP-125A0-LM1	PCP-125A0-LM1
315mm	2700 to 27000	RTP-131A0-LM1	AOP-131A0-LM1	PCP-131A0-LM1

Models for METRIC PN10 pipe (DIN 8062)

Pipe Size	GPM Flow Range	Rate & Total Model Number	Analog Output Model Number	Process Control Model Number
1 1/2"	15 to 150	RTP-115K4-GM1	AOP-115K4-GM1	PCP-115K4-GM1
2"	30 to 300	RTP-120K4-GM1	AOP-120K4-GM1	PCP-120K4-GM1
2 1/2"	40 to 400	RTP-125A4-GM1	AOP-125A4-GM1	PCP-125A4-GM1
3"	60 to 600	RTP-130K4-GM1	AOP-130K4-GM1	PCP-130K4-GM1
4"	100 to 1000	RTP-140A4-GM1	AOP-140A4-GM1	PCP-140A4-GM1
6"	250 to 2500	RTP-160A4-GM1	AOP-160A4-GM1	PCP-160A4-GM1
8"	400 to 4000	RTP-180A4-GM1	AOP-180A4-GM1	PCP-180A4-GM1
10"	600 to 6000	RTP-1100A4-GM1	AOP-1100A4-GM1	PCP-1100A4-GM1
12"	800 to 8000	RTP-1120A4-GM1	AOP-1120A4-GM1	PCP-1120A4-GM1

Models for U.S. IPS sch40 pipe (ASTM 1785)

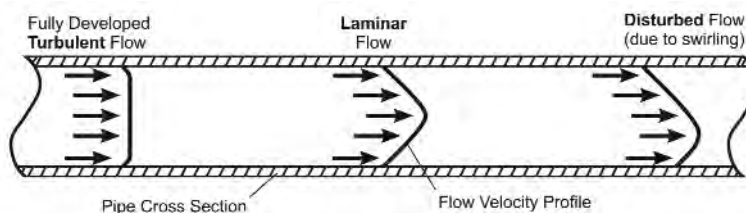
**Flow Stream Requirements:**

Measuring accuracy requires a fully developed *turbulent* flow profile. Pulsating, swirling and other disruptions in the flow stream will effect accuracy. Flow conditions with a *Reynolds Number* greater than 4000 will result in a fully developed *turbulent* flow. A Reynolds Number less than 2000 is *laminar* flow and may result in inaccurate readings.

$$REYNOLDS \ NUMBER = \frac{3160 \times Q \times G}{D \times V}$$

Where:

- Flow rate of the fluid in GPM = Q
- Specific gravity of the fluid = G
- Pipe inside diameter in inches = D
- Fluid viscosity in centipoise = V

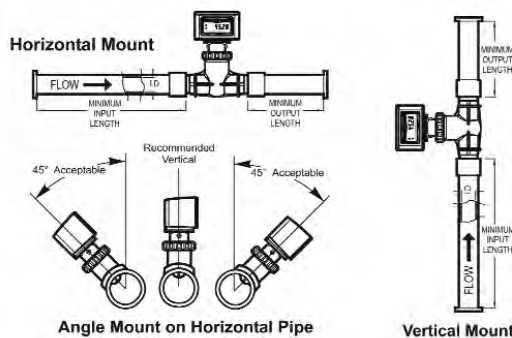


**Installation Requirements:**

**Minimum Straight Pipe Length Requirements**

The meter's accuracy is affected by disturbances such as pumps, elbows, tees, etc., in the flow stream. Install the meter in a straight run of pipe as far as possible from any disturbances. The distance required for accuracy will depend on the type of disturbance.

Type of Disturbance	Minimum Inlet Pipe Length	Minimum Outlet Pipe Length
Flange	10 x Pipe I.D.	5 x Pipe I.D.
Reducer	15 x Pipe I.D.	5 x Pipe I.D.
90° Elbow	20 x Pipe I.D.	5 x Pipe I.D.
Two Elbows - 1 Direction	25 x Pipe I.D.	5 x Pipe I.D.
Two Elbows - 2 Directions	40 x Pipe I.D.	5 x Pipe I.D.
Pump or Gate Valves	50 x Pipe I.D.	5 x Pipe I.D.



**Mounting Location**

- The meter is designed to withstand outdoor conditions. A cool, dry location, where the unit can be easily serviced is recommended.
- The meter can be mounted on horizontal or vertical runs of pipe. Mounting at the vertical (twelve o'clock) position on horizontal pipe is recommended. Mounting anywhere around the diameter of vertical pipe is acceptable, however, the pipe must be completely full of water at all times. Back pressure is essential on downward flows. See the minimum straight length of pipe requirement chart above.
- The meter can accurately measure flow from either direction.