

• **FB-1220 DUAL TURBINE** •  
**BI-DIRECTIONAL**  
**INSERTION FLOW METER**  
**DIVIDED OUTPUT**



Made in the USA

**DESCRIPTION**

ONICON insertion turbine flow meters are suitable for measuring electrically conductive water-based liquids. The FB-1220 model provides binary (digital) dry contact output signals for flow rate and direction.

**APPLICATIONS**

- Primary/secondary decoupling loop (bypass)
- HVAC thermal storage tank
- Domestic water tank charge/discharge

**GENERAL SPECIFICATIONS**

**ACCURACY**

- ± 0.5% OF READING at calibrated velocity
- ± 1% OF READING from 3 to 30 ft/s (10:1 range)
- ± 2% OF READING from 0.4 to 20 ft/s (50:1 range)

**SENSING METHOD**

Electronic impedance sensing  
 (non-magnetic and non-photoelectric)

**PIPE SIZE RANGE**

2½" through 72" nominal

**SUPPLY VOLTAGE**

24±4 V AC/DC at 70 mA

**LIQUID TEMPERATURE RANGE**

Standard: 180° F continuous, 200° F peak  
 High Temp: 280° F continuous, 300° F peak  
 Meters operating above 250° F require  
 316 stainless steel construction option

**AMBIENT TEMPERATURE RANGE**

-5 to 160° F (-20 to 70° C)

**OPERATING PRESSURE**

400 PSI maximum

**PRESSURE DROP**

Less than 1 PSI at 20 ft/s in 2½" pipe,  
 decreasing in larger pipes and lower velocities

**OUTPUT SIGNALS PROVIDED:**

**DIRECTIONAL CONTACT OUTPUT**

Isolated solid state dry contact  
 Contact rating: 100 mA, 50V  
 Switch closed when flow is in direction of arrow  
 Latches at 0.18 ft/s  
 Switches within 20 seconds of direction change

**DIVIDED CONTACT OUTPUT**

Isolated solid state dry contact  
 Contact rating: 100 mA, 50V

**FREQUENCY OUTPUT**

0-15 V peak pulse, typically less than 300 Hz

**CALIBRATION**

Every ONICON flow meter is wet-calibrated in our flow laboratory against primary volumetric standards directly traceable to NIST. Certification of calibration is included with every meter.

**FEATURES**

**Unmatched Price vs. Performance** - Custom calibrated, highly accurate instrumentation at very competitive prices.

**Excellent Long-term Reliability** - Patented electronic sensing is resistant to scale and particulate matter. Low mass turbines with engineered jewel bearing systems provide a mechanical system that virtually does not wear.

**Industry Leading Two-year "No-fault" Warranty** - Reduces start-up costs with extended coverage to include accidental installation damage (miswiring, etc.). Certain exclusions apply; see our complete warranty statement for details.

**Installation Flexibility** - Patented dual turbine models deliver outstanding accuracy in short pipe runs.

**Simplified Hot Tap Insertion Design** - Standard on every insertion flow meter. Allows for insertion and removal by hand without system shutdown.

OPERATING RANGE FOR COMMON PIPE SIZES 0.17 TO 20 ft/s ± 2% accuracy begins at 0.4 ft/s	
Pipe Size (Inches)	Flow Rate (GPM)
2½	2.5 - 230
3	4 - 460
4	8 - 800
6	15 - 1800
8	26 - 3100
10	42 - 4900
12	60 - 7050
14	72 - 8600
16	98 - 11,400
18	120 - 14,600
20	150 - 18,100
24	230 - 26,500
30	360 - 41,900
36	510 - 60,900

(continued on back)

# FB-1220 SPECIFICATIONS cont.

## MATERIAL

- Wetted metal components
  - Standard: Electroless nickel plated brass
  - Optional: 316 stainless steel

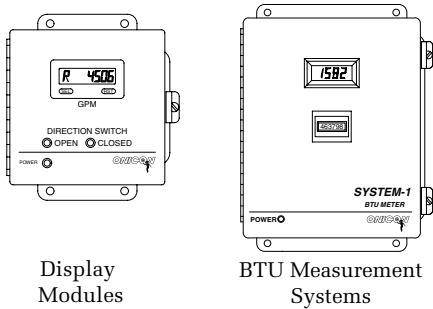
## ELECTRONICS ENCLOSURE

- Standard: Weathertight aluminum enclosure
- Optional: Submersible enclosure

## ELECTRICAL CONNECTIONS

- 6-wire minimum for directional switch and divided flow signal switch output
- Frequency output requires an additional wire
- Standard: 10' of cable with 1/2" NPT conduit connection
- Optional: Plenum rated cable

## ALSO AVAILABLE

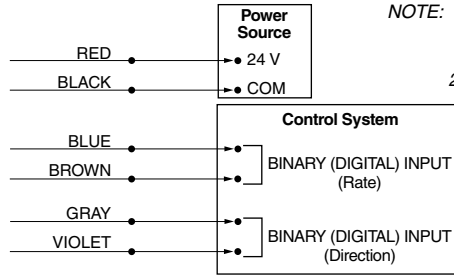


# FB-1220 Wiring Information

WIRE COLOR CODE		NOTES
RED	(+) 24 V AC/DC supply voltage, 70 mA	Connect to power supply positive
BLACK	(-) Common ground (Common with pipe ground)	Connect to power supply negative
GREEN	(+) Frequency output signal: 0-15 V peak pulse	Required when meter is connected to local display or BTU meter
BLUE	Dry contact divided output - indicates flow rate	Output can be divided by any binary number up to 4096 to meet frequency limitations of control system
BROWN		
GRAY	Dry contact directional output - indicates flow direction	Contact closed when flow is in direction of arrow on meter
VIOLET		
DIAGNOSTIC SIGNALS		
ORANGE	Bottom turbine frequency	These signals are for diagnostic purposes - connect to local display or BTU meter
WHITE	Top turbine frequency	

## FB-1220 Wiring Diagram

### Flow Meter into Control System (No Display or BTU Meter)

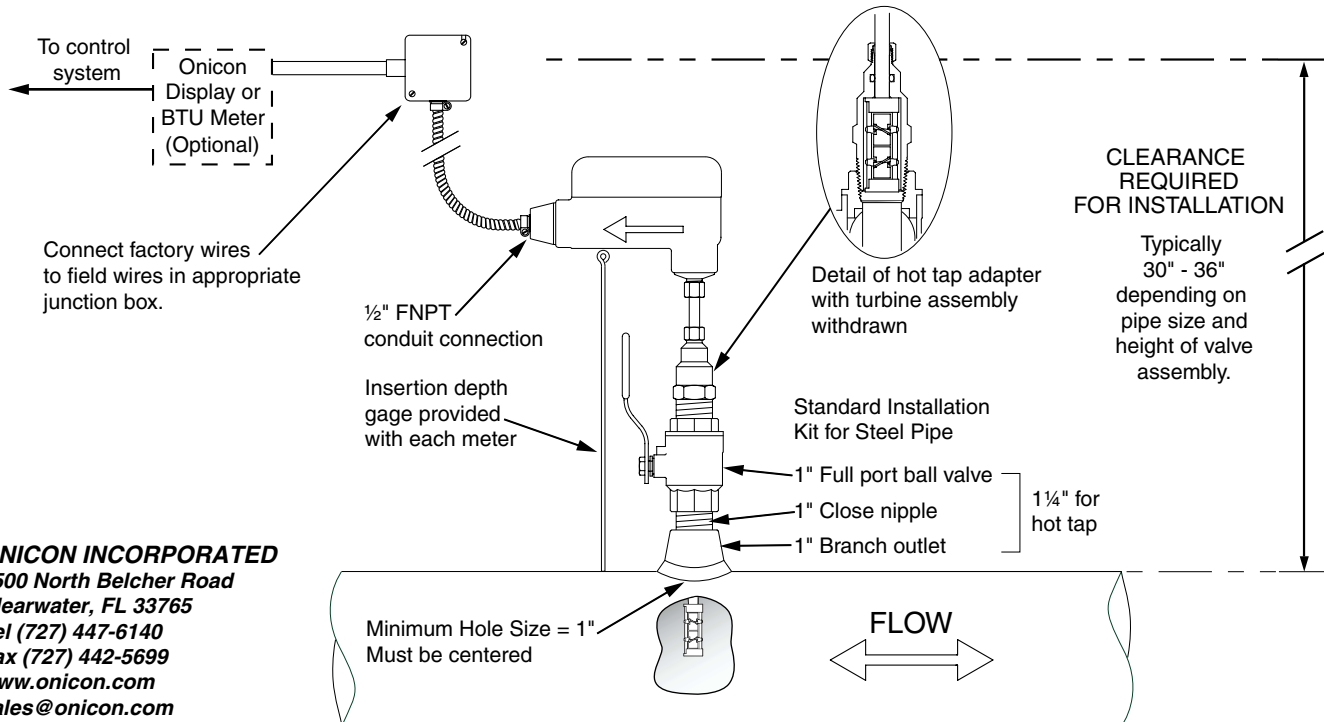
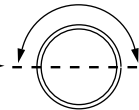


- NOTE:**
1. Black wire is common with the pipe ground (typically earth ground).
  2. Frequency output required for ONICON display module or BTU meter, refer to wiring diagram for peripheral device.

## Typical Meter Installation

(New construction or scheduled shutdown)

- Acceptable to install in vertical pipe
- Position meter anywhere in upper 180° for horizontal pipe



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Note: Installation kits vary based on pipe material and application. For installations in pressurized (live) systems, use "Hot tap" 1 1/4 inch installation kit and drill hole using a 1 inch wet tap drill.