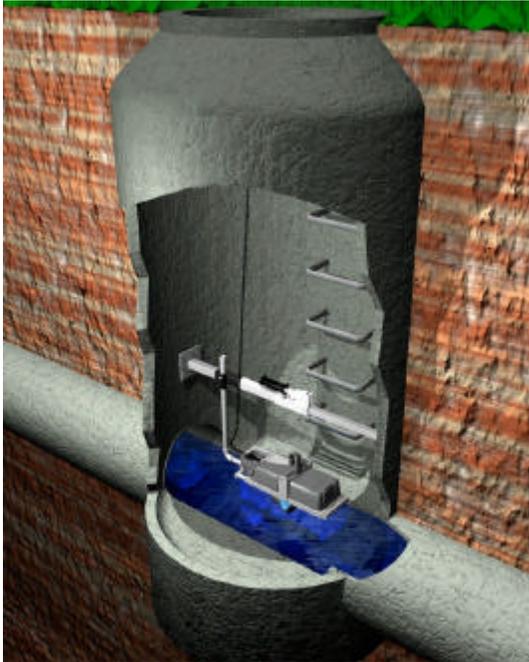


# Chapter 5

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## Model 464-BC Monitor Operation

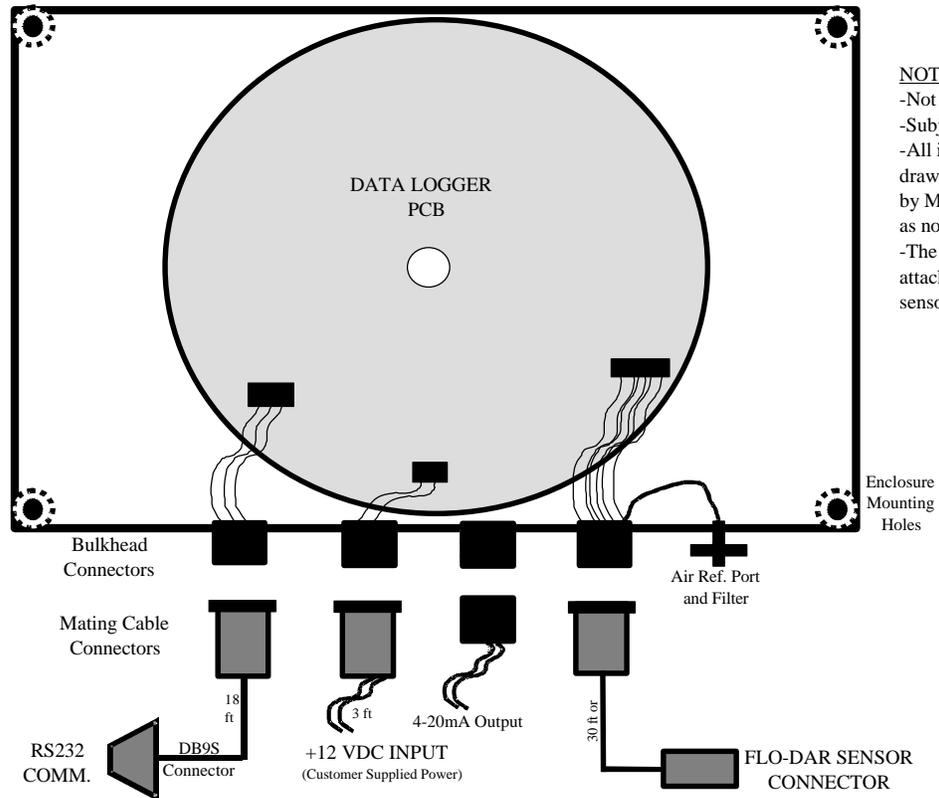


The Model 464-BC Monitor controls and stores flow data from Marsh-McBirney Flo-Dar sensors. A portable computer and Flo-Ware software is used to setup the flowmeter for the particular site and can also serve as a powerful data retrieval and reporting system. The three programmable 4-20 mA outputs provide a convenient way to transfer real time flow data to SCADA and other data collection systems, control systems and display devices.

# RS232 Version/Wiring Diagram

## MODEL 464-BC MONITOR DC POWERED FLO-DAR (RS232 VERSION)

Enclosure:  
Polystyrene with cover  
7.0H x 9.0W x 4.0D



**NOTES:**  
-Not to Scale  
-Subject to Change  
-All items on this drawing supplied by MMI except as noted  
-The connector that attaches to the Flo-Dar sensor is 1.2" diameter.

# Connecting the Monitor

## Sensor Connection

Connect the sensor cable to the sensor connector located monitor housing. If the sensor end of the cable is not already connected to the sensor it should be connected now. See Page 37 for instructions on connecting the sensor cables at the sensor end.

## Power Connections

The Model 464-BC comes with a 3 ft. power cable. The red wire is +12 VDC. The black wire is the power common. A longer customer supplied cable can be substituted if desired.

### **Power Connector Hook-Up (6 Pin Bendix)**

+12 VDC in	A	Red
N/C	B	
N/C	C	
Power Common	D	Black
N/C	E	

### **4-20 mA Output Connector**

The Model 464-BC comes with a 10 ft. 4 to 20 mA output cable. A longer customer supplied cable can be substituted if desired.

### **Output Connector Hook-Up (15 Pin Bendix)**

4 to 20 mA	#3 (+)	C	Blue
4 to 20 mA	#3 (-)	D	Brown
4 to 20 mA	#2 (+)	E	Black
4 to 20 mA	#2 (-)	F	White
4 to 20 mA	#1 (+)	G	Red
4 to 20 mA	#1 (-)	H	Green

Pins A-B and K-R are not used.

## Desiccant Cartridge

The Model 464-BC monitor should be mounted in a relatively dry environment such as a control room or other suitable space. A hydrophobic filter is attached to the APR port and should be all that is required in most applications.

If the monitor is installed in a high moisture environment such as a pit, make sure a fresh desiccant cartridge is attached to the atmospheric pressure reference (APR) port located on the bottom of the Model 464-BC housing. Leave the filter in place and attach the desiccant cartridge to the filter. The desiccant cartridge protects the APR tube from moisture and debris effecting the accuracy of the surcharge level pressure transducer. Whenever a desiccant cartridge turns mostly pink, it should be replaced with a fresh (blue) cartridge. If desired, two cartridges may be used in series for long lasting protection. Desiccant cartridges Part #55032 may be purchased from Marsh-McBirney, Inc.

## RS-232 Serial Communications Cable

A portable computer with Flo-Ware software installed must be connected via a communication cable to the Model 464-BC to set up and collect data from the flowmeter. The communication cable is part of the Flo-Ware software package. Extra cables may be purchased by registered Flo-Ware users. The RS-232 Serial Communications Connector is located on the bottom of the Model 464-BC housing. The protective cover should remain in place whenever the communication cable is not connected.

The Flo-Dar communication cable P/N 131013101 is different from the communication cable used for Flo-Tote flowmeters.

# Setting Up the Model 464-BC for Your Site

Note: The Flo-Ware™ T-200 Software with Flo-Dar File Driver is Required to Set-Up the Model 464-BC Flowmeter

T-200 software with the Flo-Dar file driver is used to configure your Model 464-BC to a particular metering site, scale the 4-20 mA outputs, transfer stored data from the flowmeter to your computer system, view the operation of your meter in real time, and to run reports and graphs based on the collected data.

Detailed instructions for using Flo-Ware T-200 software are contained in the Discovering Flo-Ware Flo-Dar System Manual. This manual covers operation of the Model 460 and 464-BC monitors. The 4-20 mA output setup instructions are found in the extended setup section. Instructions are also accessed directly from the T-200 program via the Help function.

The sensor offset and site specific information such as pipe shape, pipe ID and sediment level obtained during sensor installation will need to be entered into the site set-up section of T-200 Flo-Dar communications.

## Securing the Monitor

- 1** #10 or #8 screws or bolts may be used to secure the monitor to a flat surface. Drill a 6 by 8 inch (153 x 203 mm) hole pattern where the monitor is to be mounted.
- 2** Pull up and turn to remove the four cover screws from the cover of the monitor. Note the cover is sealed and should be left in place.
- 3** Insert the mounting screws or bolts through the four holes at the corners of the monitor and secure the monitor to the flat surface.
- 4** Re-install the cover screws.

# Specifications

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## Sensor

### Enclosure

Material: Polystyrene  
Dimensions: 6.9" W x 16.65" L x 11.7" D  
(17.5 cm x 42.3 cm x 29.7 cm)  
Weight: 10.5 lbs.

### Temperature

Operating Range: -32° F to 122° F  
(-35° C to 50° C)  
Storage Range: -40° F to 140° F  
(-40° C to 60° C)

### Sensor Cable

Material: Polyurethane jacketed  
Standard Length: 30 feet (9.14m),  
maximum 500 feet (152.4 m).  
Both the sensor and the monitor have IP68 waterproof  
connectors for easy disconnection.

### Velocity Measurement

Method: Radar  
Range: 0.75 to 20 ft/s  
(0.23 m/s to 6.10 m/s)  
Accuracy:  $\pm 0.5\%$ ;  $\pm 0.1$  ft/s ( $\pm 0.03$  m/s)

### Level Measurement

Method: Ultrasonic  
Operating Range: 0.25 to 60 in.  
(0.634 to 152.4 cm)  
Temperature Compensated  
Accuracy:  $\pm 0.25$  in. ( $\pm 0.64$  cm)  
1% Accuracy

### Surcharge Level Measurement

Method: Piezo-resistive pressure transducer  
Maximum Range: 138 inches (3.5 meters)

### Flow Measurement

Based on Continuity Equation.  
Accuracy:  $\pm 5.0\%$  of reading typical where flow is in a  
channel with uniform flow conditions and is not  
surcharged.

## Monitor

### Data Storage

64K (16K cycles of velocity/level data)

### Local Terminal

RS232C at 19.2K baud

### 4-20 mA Outputs

(3) fully programmable, isolated outputs capable of driving  
650 $\Omega$  each.

### Power Requirements

+12 VDC @ 220 mA with all three 4-20mA outputs @  
20mA

### Housing

Material: Polystyrene (IP66-7/IP67-7)  
Height: 7" (188 mm)  
Width: 9" (229 mm)  
Depth: 4" (102 mm)  
Weight: 2.75 lbs. (1.25 kg)

### Temperature

Operating Temperature Range:  
32° F to 122° F (0° C to 50° C)  
Storage Temperature Range:  
-4° F to 122° F (-20° C to 50° C)

### Setup/Data Retrieval

Flo-Ware for Windows software (sold separately) is the  
instrument setup and report generation software for the  
Model 464-BC. It is compatible with computers (desktop  
and portable) utilizing Windows 95/98/NT. Flo-Ware for  
Windows software can retrieve data from both Flo-Tote  
and Flo-Dar Flowmeters.

### Sensor/Logger Disconnect

Both the sensor and the logger have waterproof (IP68)  
connectors for easy separation from the interconnecting  
cable.

### Certification

FCC Rules Part 15; Industry Canada RS 210 (No user  
license required.)