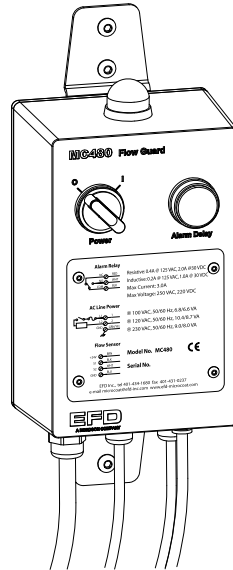
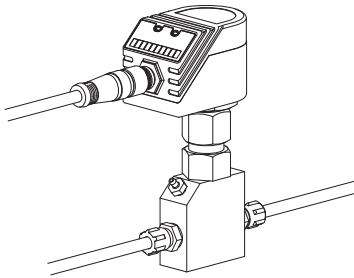


MicroCoat® Flow Guard

Operating Manual

MC480M Series



IMPORTANT!
Save this Sheet.

Forward to
Maintenance or
Tool Crib Supervisors

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Contents

Introduction	3
Specifications.....	4
Features	5
MC800 System Assembly	6-7
Priming the System	7
System Diagram	8-9
MC4000 System Assembly	10
MC2000 System Assembly	10
Setup.....	11-13
Making Flow Adjustments	14
Operation	15
Preventive Maintenance.....	16
Troubleshooting Guide.....	17
Replacement Part Numbers	18-19
Warranty	Back Cover

Introduction

The purpose of the Flow Guard system is to signal a high or low flow condition. The MC480M operates on the calorimetric principle. As lubricant flows over the tip of the sensor, it removes thermal energy from the sensor. The amount of power required to maintain the temperature of the sensor is proportional to fluid flow. Coupled with the sensor is a controller that provides a logic interface between the sensor output and the stamping/forming press. The MC480M system provides an alarm signal when lubricant flow varies enough to cross either the low flow or high flow set points. The signal is typically connected to an E-Stop circuit to shut the press down when an alarm condition is present. The set points are determined empirically and are based on an acceptable range of flow determined by the user.

The MC480M Flow Guard system is designed to work together with the MicroCoat lubrication system. Control pressure used to operate the MicroCoat System also provides press status input to the MC480M.

Upon initiation of control air:

1. The MicroCoat system valves open and lubricant begins to flow.
2. The MC480M alarm system becomes active and a 30-second delay period commences while the sensor completes a start-up sequence.
3. The sensor's green LED settles between the upper and lower control switch points indicating the flow is recognized and being monitored.

When flow exceeds an alarm set point:

1. The MC480M stops press operation through the press E-Stop circuit.
2. The system "control air" is turned off.
3. The alarm indicator illuminates.

Once the error condition is corrected, the press is restarted resuming "control pressure" and flow monitoring.

Specifications

MC480 Controller

Size:	11.9 W x 19.1 H x 8.9 D cm (4.7" x 7.5" x 3.5")
Weight:	1.45 kg (3.20 lb)
Input voltage:	MC480M-120: 120 VAC, 50/60 Hz, 10.4/8.7 VA MC480M-220: 220 VAC, 50/60 Hz, 9.0/8.0 VA
Resistive:	0.4A @ 125 VAC, 2.0A @ 30 VDC
Inductive:	0.2A @ 125 VAC, 1.0A @ 30 VDC
Maximum current:	3.0A
Maximum voltage:	250 VAC, 220 VDC
Minimum air pressure:	40 psi (2.76 bar)
Protection:	IP67

MC480-FS Flow Sensor

Size:	4.1 W x 10.9 H x 7.1 D cm (1.6" x 4.3" x 2.8")
Weight:	0.47 kg (1.03 lb)
Operating voltage:	20-36 VDC
Current rating:	2 x 125mA, short-circuit protection Reverse polarity protection/overload protection
Temperature range:	-25°C to 80°C (-13°F to 176°F)
Protection:	IP67
Sensor material:	Type 316 stainless steel

Meets CE standards



NOTE: Specifications and technical details are subject to engineering changes without prior notification.

RoHS标准相关声明 (China RoHS Hazardous Material Declaration)

产品名称 Part Name	有害物质及元素 Toxic or Hazardous Substances and Elements					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr6)	多溴联苯 Polybrominated Biphenyls (PBB)	多溴联苯醚 Polybrominated Diphenyl Ethers (PBDE)
金属转接头 All Brass Fittings	X	0	0	0	0	0

0: 表示该产品所含有的危险成分或有害物质含量依照EIP-A, EIP-B, EIP-C 的标准低于SJ/T11363-2006 限定要求。
Indicates that this toxic or hazardous substance contained in all the homogeneous materials for this part, according to EIP-A, EIP-B, EIP-C is below the limit requirement in SJ/T11363-2006.

X: 表示该产品所含有的危险成分或有害物质含量依照EIP-A, EIP-B, EIP-C 的标准高于SJ/T11363-2006 限定要求。
Indicates that this toxic or hazardous substance contained in all the homogeneous materials for this part, according to EIP-A, EIP-B, EIP-C is above the limit requirement in SJ/T11363-2006.

Features

1. Power Switch

Turns the system on and off.

2. Alarm Delay Switch

Starts a 3-minute delay that prevents press shutdown when setting new oil flow rate.
Push and hold for 3 seconds to cancel alarm.

3. Alarm Indicator

Illuminates when improper flow is detected—
blinks in override mode.

4. AC Power

5. E-Stop Circuit Connection

6. Control Air Input

Activates the system when control air is
supplied.
Minimum 40 psi (2.76 bar) required.

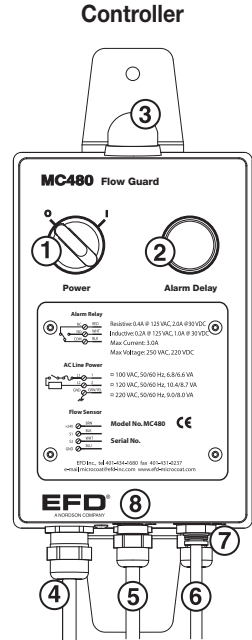
7. Flow Sensor Connector

8. Fuse

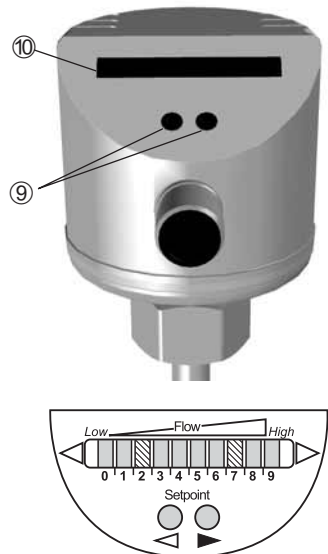
9. Setting Buttons for Adjustment and Configuration

10. Operation Display

Green LEDs indicate the current flow (the LEDs 0-9 represent the range between no flow and maximum flow)
Two LEDs indicate the position of the switch points (orange = output closed, red = output open).



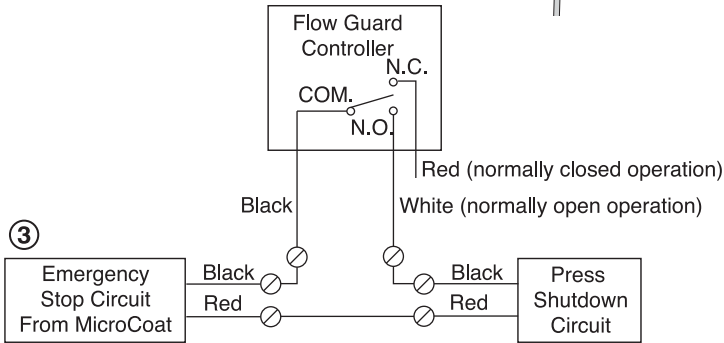
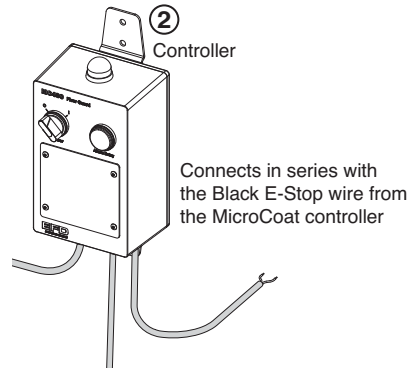
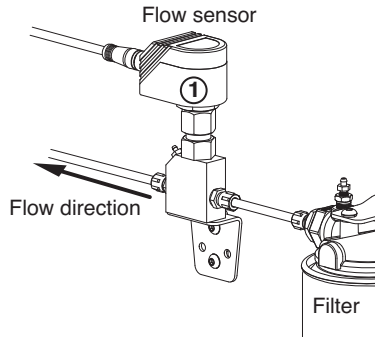
Flow Sensor



System Assembly

MC800

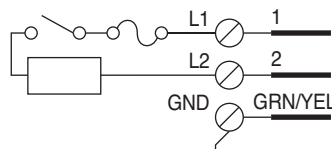
1. Install the flow sensor with adapter at the MCFILTER outlet using the supplied fittings. The bar graph side of the unit should face the downstream flow direction.
2. Find a suitable location where ambient temperature is fairly constant, then securely mount the controller and flow sensor. The MicroCoat stand is an ideal location if used.
3. Connect the MC480M E-Stop circuit wire to the MicroCoat E-Stop circuit.
4. Refer to the schematic and connect the controller power cord to an appropriate source.



④ **Caution!**
Risk of electric shock

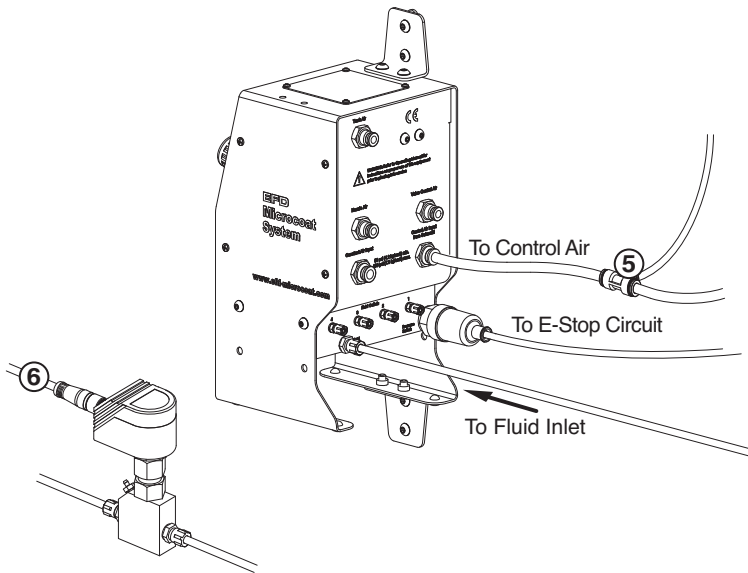
Warning!
Disconnect power before removing cover

AC Line Power



IMPORTANT: Electrical connections must be made by a licensed electrician.

5. Install the supplied tee fitting onto the MicroCoat control air coupling, and connect the grey hose from the air tee on the controller to the input on the Flow Guard controller.
6. Secure the connecting cable to the flow sensor.



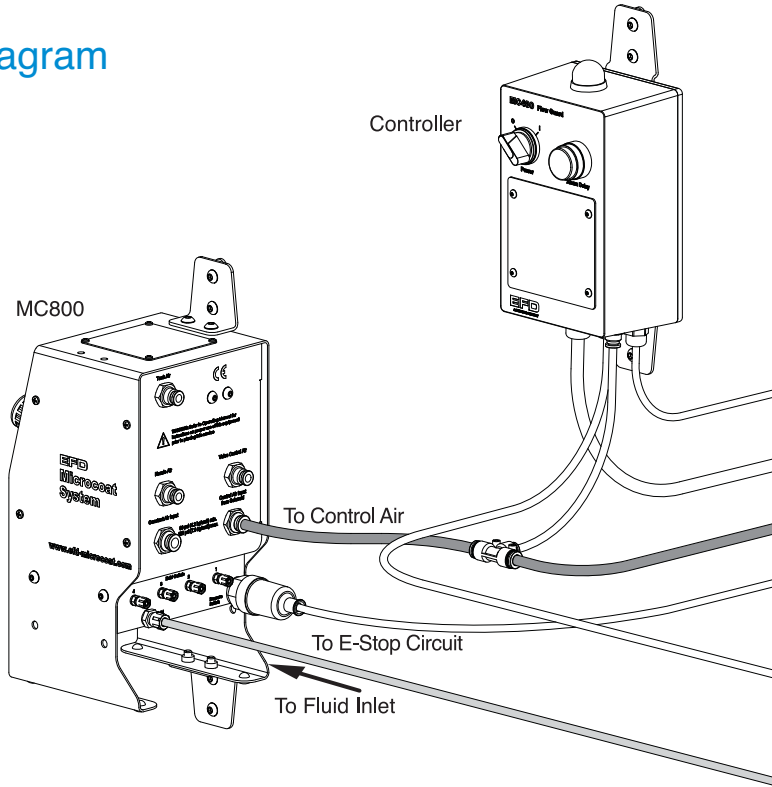
Priming the System










IMPORTANT: The system must be primed free of air for proper performance.

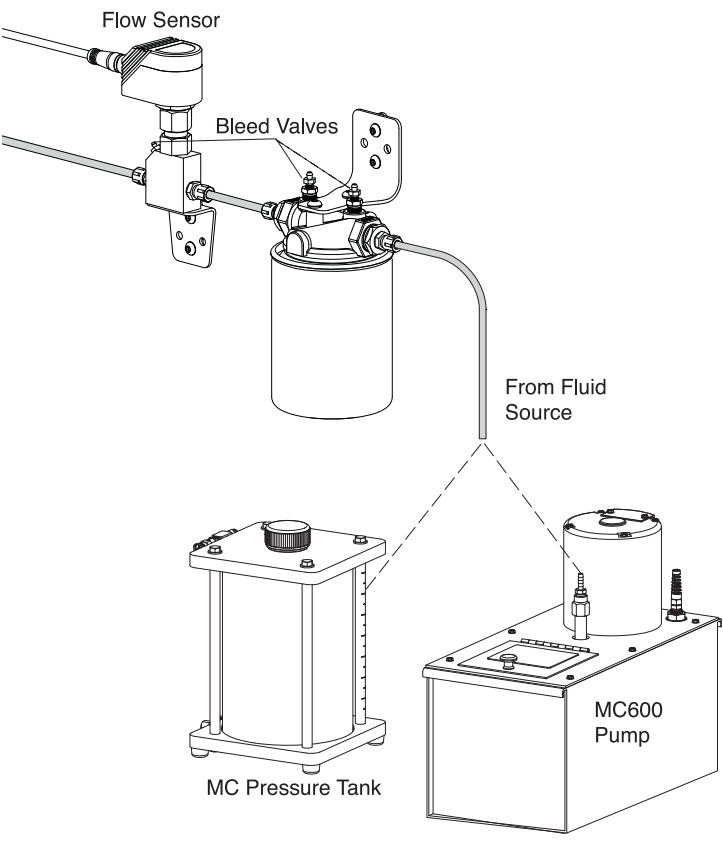
Refer to the System Setup instructions in the MC800 MicroCoat System manual for detailed explanation on priming the system.

System Diagram



	Lubricant (clear hose)
	Operating Air
	Fluid sensor connection

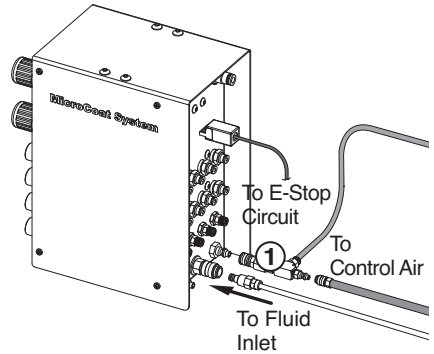
-  Connects in series with the Black E-Stop wire from the MicroCoat controller
-  To AC Line Power
-  From Control Air Solenoid
-  To E-stop Circuit



System Assembly

MC4000

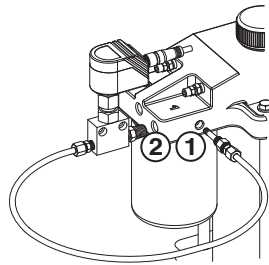
- A. Refer to the figure to the right for installation assistance. Follow steps 1 through 4 on MC800 System assembly instructions (page 6).
- B. Install the supplied tee fitting onto the MicroCoat control air coupling ① and connect the grey hose from the air tee on the controller to the input on the Flow Guard controller.
- C. Secure the connecting cable to the flow sensor.



System Assembly

MC2000

- A. Refer to the figure to the right and remove the pipe plugs from ports ① and ②.
- B. Install the flow sensor with adapter into the rear hole ② of the MC2000. The bar graph side of the sensor should face towards the front of the MC2000.
- C. Install the special fitting with O-ring into the side port ① of the MC2000 and tighten.
- D. Using the fittings and tubing supplied, connect the side port ① to the inlet of the flow sensor as shown.

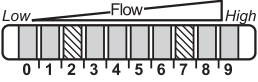
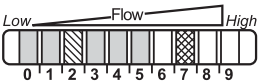
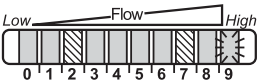


NOTE: Complete the MC2000 assembly using steps 4 through 6 on pages 6 and 7.

Set-up and settings for water

(For media other than water → 7.1: Low flow adjustment).

- Switch on the supply voltage.
- All LEDs light and go out again step by step. During this time the outputs are closed (if configured as normally open). The unit is in the operating mode.
- Let the normal flow circulate in the installation.
- Check the display and determine further actions.

1		<p>The factory setting is suitable for the application.</p> <ul style="list-style-type: none"> • Adapt the switch points to your application if necessary (→ 6.2, 6.3).
2		<p>Your normal flow is below the representation range of the display.</p> <ul style="list-style-type: none"> • Carry out high flow adjustment (→ 6.1). • Adapt the switch points to your application if necessary (→ 6.2, 6.3).
3		<p>Your normal flow exceeds the representation range of the display (LED 9 flashes).</p> <ul style="list-style-type: none"> • Carry out high flow adjustment (→ 6.1). • Adapt the switch points to your application if necessary (→ 6.2, 6.3).

You can restore the factory setting any time. (→ 7.3).

High flow adjustment (optional)

The unit determines the existing flow as normal flow and adapts the display representation

(all LEDs except the switch point LEDs light green).

- Let the normal flow circulate in the installation.
- Press the pushbutton ► and keep it pressed.
 > LED 9 lights, after approx. 5 s it flashes.
- Release the pushbutton.

The unit is now adapted to your flow conditions. It passes into the operating mode, the display should now show example 1.



NOTE: The adjustment affects the switch points: They are increased proportionally.

Change switch point SP1

- Briefly press the pushbutton ◀.
> The SP1-LED flashes red, the SP2-LED lights red.
- Press the pushbutton ◀ or ▶ as often as required. Each press of the pushbutton shifts the LED by one position in the indicated direction.



NOTE: If no pushbutton is pressed for 2 s, the unit returns to the operating mode with the newly set value.

Change switch point SP2

- Briefly press the pushbutton ▶.
> The SP2-LED flashes red, the SP1-LED lights red.
- Press the pushbutton ◀ or ▶ as often as required. Each press of the pushbutton shifts the LED by one position in the indicated direction.



NOTE: If no pushbutton is pressed for 2 s, the unit returns to the operating mode with the newly set value.

Additional settings (optional)

Low flow adjustment

If the unit is used in media other than water, you should additionally adapt the unit to the minimum flow.



NOTE: The following adjustment must only be carried out after the high flow adjustment.

- Let the minimum flow circulate in the installation or ensure flow standstill.
- Press the pushbutton ◀ and keep it pressed.
> LED 0 lights, after approx. 5 s it flashes.
- Release the pushbutton. The unit adopts the new value and passes into the operating mode.

Configure the switching outputs

The unit is delivered as normally open. In case of need you can change the outputs to normally closed (the changing applies to both outputs):

- Press the pushbutton ◀ for at least 15 s.
 - > LED 0 lights, after approx. 5 s it flashes.
 - > After 10 s the current setting is displayed: LEDs 5...9 light orange (= outputs normally open). > After approx. 15 s LEDs 0...4 flash orange.
- Release the pushbutton. The outputs are changed to normally closed operation.

For a new changeover repeat the operation.

Restore the factory setting (reset)

- Press the pushbutton ▶ for at least 15 s.
 - > LED 9 lights, after approx. 5 s it flashes.
 - > After approx. 15 s LEDs 0...9 flash orange.
- Release the pushbutton. All settings are reset to the factory setting:
 - operating area: 5 ...100 cm/s for water
 - switch point SP1: LED 2 / switch point SP2: LED 7
 - output function: NO
 - unlocked.

Lock / unlock the unit

The unit can be locked electronically to prevent unintentional settings.

- Press both setting pushbuttons simultaneously for at least 10 s in the operating mode.
 - > The indication goes out, the unit locks or unlocks.

On delivery: unlocked.

Making Flow Adjustment

Making an adjustment to the flow volume may cause the flow sensor to cross the preset alarm set points. To avoid triggering the E-Stop circuit, the MC480M is equipped with an alarm delay. Initiating this delay provides three minutes to reset the flow and reprogram the sensor.

1. Push the Alarm Delay switch on the controller to initiate the 3-minute delay. The alarm indicator will begin to flash.



NOTE: If more time is required, pushing the switch again will restart the 3-minute delay.

2. Establish the new flow setting for the MicroCoat System.
3. Program the sensor as instructed on page 11.
4. Push and hold the Alarm Delay switch for 3 seconds to cancel the delay or just allow the time to run out. The alarm indicator will stop flashing.






NOTE: Switch points are factory set to LEDs #2 and #7. These settings should be right for most applications. If you require more or less sensitivity, follow the procedure on page 13 to change the switch points.

Operation

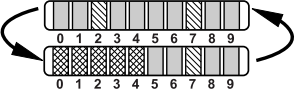
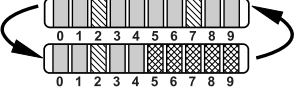
After every power on all LEDs light and go out again step by step (during this time the outputs are closed if configured as normally open). The unit is then ready for operation.

In case of power failure or interruption all settings remain.

Operating indicators

	<p>Green LED bar: Current flow within the representation range. Indication of the switch points (SP1 / SP2): - LED orange: output closed. - LED red: output open.</p>
	<p>LED 9 flashes: current flow above the representation range.</p>
	<p>LED 0 flashes: current flow far below the representation range.</p>

Interference indicators

	<p>Short circuit at the switching output S1. The operating indicator and 5 red LEDs on the left hand light alternately. If the short circuit has been rectified, the unit immediately passes into the normal operating state. The current operating state is displayed.</p>
	<p>Short circuit at the switching output S2. The operating indicator and 5 red LEDs on the right hand light alternately. If the short circuit has been rectified, the unit immediately passes into the normal operating state. The current operating state is displayed.</p>
<p>Display OFF (no LED lights):</p>	<p>Operating voltage too low (< 19 V) or failed. Ensure a correct voltage supply.</p>

Preventive Maintenance

The MC480M is designed for long life with minimal maintenance.



CAUTION: Before performing any maintenance, set the system pressure to the OFF position and disconnect power.

Check the sensor tip after the first month of operation to establish an appropriate cleaning schedule. Clean the sensor probe periodically.

Troubleshooting Guide

Unstable oil flow causes unit to switch off.

Unstable oil flow can be caused by air pressure fluctuations. Make sure the MicroCoat system pressure is stable.

The lubricant system may have entrapped air. This air, when it reaches a flow control, can cause a flow surge from the valve.

System trips off and indicates an underflow condition even though there is no air pressure fluctuation or air in the lubricant system.

Reset the minimum flow level by turning the MicroCoat system off, then push the Learn/Set button and hold until LEDs light step by step from left to right, then step by step from right to left. The low switch point will now be 20% above zero flow.

The low switch is slow to respond to an underflow condition.

The low switch point can be moved closer to the center of the bar graph. The low switch point is factory set at #2. Changing the setting to #3 will provide a faster response time. Refer to page 13 for this procedure.

Sensor is very unstable. Sometimes switching off low and at other times high.

Check the sensor probe for contamination and clean if necessary.

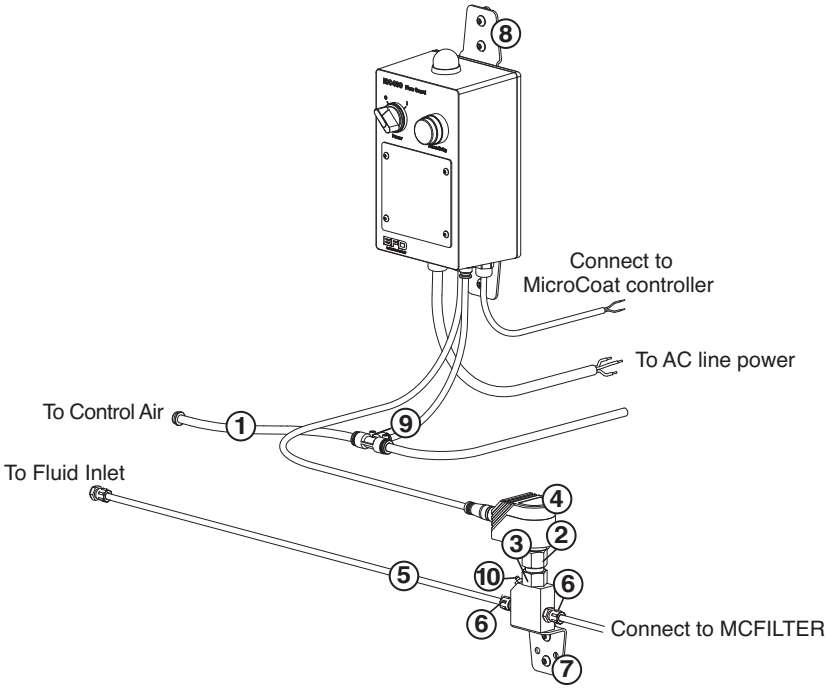
Check the sensor location. The bar graph display must face downstream.

Check to make sure the sensor is installed fully into the adapter.

The sensor must be located in an area that is away from air currents that can cause temperature changes. If necessary, wrap the sensor adapter with an insulating blanket.

Replacement Part Numbers

- | | | |
|-----|----------|-----------------------------------|
| 1. | 8126-W | Tubing - 6 mm OD, urethane, white |
| 2. | 4070 | Sensor to adapter coupler |
| 3. | 4069 | Low flow adapter |
| 4. | 480FS | Flow sensor assembly |
| 5. | 2024-6mm | Tubing - 6 mm OD, urethane, blue |
| 6. | 8131 | Fitting - 1/8 BSPP x 6 mm OD barb |
| 7. | MC7302 | Sensor bracket |
| 8. | MC7301 | MicroCoat controller brackets |
| 9. | 8155 | Fitting - 8 mm x 6 mm push-in tee |
| 10. | 8150 | Bleed valve |
| 11. | 4084 | MC2000 sensor adapter (not shown) |



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