

# Flow Computer Installation

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**WARNING: Only personnel who are experienced with field wiring should perform these procedures.**

**All field wiring must conform to the National Electrical Code, NFPA 70, Article 501-4(b) for installations within the United States. Additional Local wiring ordinances may also apply.**

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## Installation Overview

Read the following steps before installation.

1. Pre-Configure flow computer Input/Outputs
  - Connect RS232 Communication (3 wires – TX, RX and Ground)
  - Wire the flow computer to the external power source and power the unit.
  - Verify Display is ON.
  - Configure flow computer using Dynacom Window Software on PC
  - Disconnect the power and the unit is now ready to install.
2. Remove the meter run from service
3. Mount the flow computer assembly according to the mounting procedures.
4. If an external RTD is required, install the RTD and connect it to the termination board.
5. Connect the impulse lines if frequency input is configured.
6. Install all other input/outputs according the pre-configured software (Analog inputs, Status inputs, Switch outputs and Analog outputs).
7. Wire the flow computer to the external power source and power the unit.
8. Verify Display is ON.
9. Connect the flow computer unit to any other external communication devices such as DCS or PLC.
10. Calibrate the inputs from multi-variable sensor, analog input, and RTD using the calibration buttons on the Dynacom software.
11. Calibrate the Analog Output if used.
12. Verify the status inputs and switch outputs.
13. Place the meter run in service
14. Monitor the flow computer and Consult the Fault Finding if a problem is incurred.

## **Installation Requirements**

To plan an installation, location, ground locations, climate, and site accessibility and application should be considered.

## **Environmental Requirements**

The flow computer enclosure is classified as a NEMA 4 equivalent enclosure. That provides the level of protection required to keep the units operating under a variety of weather conditions.

The flow computer is designed to operate over a -40 to 85°C (-40 to 185°F) temperature range. The LCD temperature range is -20 to 70°C (-4 to 158°F). Errors or failure of the unit could occur if operation is beyond the recommended temperature range.

## **Compliance with Hazardous Area Standards**

The flow computer unit also has a Class I Division 1, 2, Groups A, B, C & D approval.

**Class** defines the general nature of the hazardous material in the surrounding atmosphere. Class I is for locations where flammable gases or vapors may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

**Division** defines the probability of hazardous material being present in an ignitable concentration in the surrounding atmosphere.

**Division 1** locations are presumed to be hazardous.

**Division 2** locations are areas where gas, dust or vapors can exist under abnormal conditions.

**Group** defines the hazardous material in the surrounding atmosphere.

**Group A** – Atmosphere containing acetylene, gases or vapors of equivalent hazards.

**Group B** – Atmosphere containing hydrogen, gases or vapors of equivalent hazards.

**Group C** – Atmosphere containing ethylene, gases, or vapors of equivalent hazards.

**Group D** – Atmosphere containing propane, gases, or vapors of equivalent hazards.



**WARNING: Installation in a hazardous area could result in personal injury or property damage.**

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### **Mounting the Flow Computer**

The flow computer enclosure assembly can mount directly to an orifice plate meter or cone meter by using a 5 valve manifold.

#### **Hardware**

A 5 valve manifold for connecting process lines to the flow computer, mounting adapter, the threaded HEX adaptor, tubing and/or pipe for plumbing process connections, and other tools and accessories. To prevent fittings from turning and/or to avoid putting tension on stainless steel tubing, use a backup wrench to attach stainless steel tubing to a manifold.



**WARNING: The tubing and fixtures used to connect the flow computer to the flow line must be manufactured from materials that are appropriately rated for the pressure of the process.**

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### **Installation Steps**

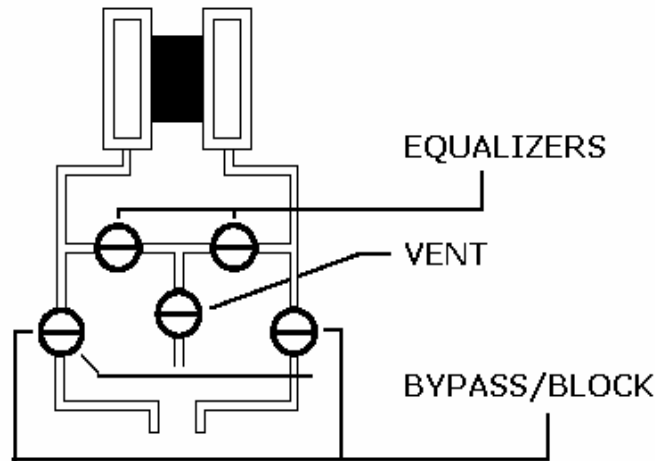
1. Remove the meter run from service.
2. Bolt a flange-by-flange 5-valve manifold to the flow computer
  - Locate the **H** and **L** markings on the flow computer sensor body
  - Orient the flow computer and manifold assembly

#### **Considerations:**

The upstream side of flow line must be connected to the sensor's "High" port.  
The downstream side of flow must be connected to the sensor's "Low" port.  
For orifice plate applications, the handle of the orifice has the word "Inlet" on the side that faces upstream.

- Rotate flow computer to face the desired direction
3. Position the manifold so that all valves are easily accessible.
  4. Connect the flow computer and manifold assembly to the differential pressure meter. A mounting adapter may be required. Hardware requirements will vary.
  5. Locate the Multivariable RTD boss, remove the nut, and install RTD assembly if using the Multivariable RTD. If using the on-board RTD connection bring the RTD wiring through any of the 3/4" NPT side openings on the housing.
  6. Route any additional inputs/outputs or communication cable connections, etc. through the conduit 3/4" NPT opening at the top of the flow computer. In hazardous environments, add a conduit seal. **NOTE:** For wiring drawings for a particular flow computer model please refer to that model's manual.

7. Perform a manifold leak test



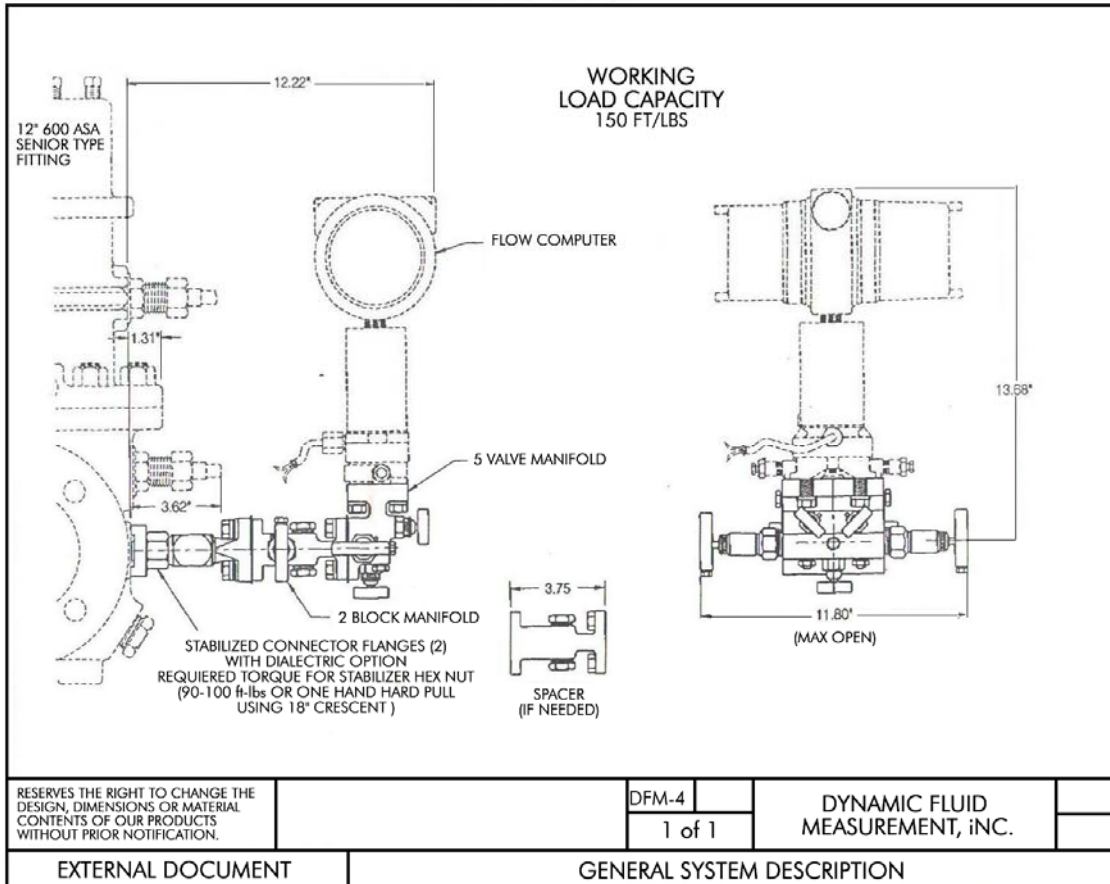
- Verify the instrument is properly connected to the pressure source
  - Close vent valve. (The bypass/block valves should be open)
  - Close bypass and block valves to isolate pressure between the block valve and the flow computer.
  - Open both equalizer valves to distribute pressure throughout.
  - Monitor the pressure reading and watch for a steady decrease in pressure.
  - If leakage is indicated, depressurize the system by opening bypass and block valves, then check manifold and piping joints. Retest the leaks.
  - If the test is leak free, close equalizing valves and the open the vent.
  - Repair or replace the manifold if required.
8. The transmitter should be zeroed after mounting in order to correct for installation effects.
9. Verify the zero offset if required



**WARNING: Do not put flow computer into service until the valves are positioned properly.**

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The following Figures are a basic illustration of a direct-mount installation











**CHAPTER 1: Explosion-Proof Installation Drawings**

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AA				

**12.** INSTALLATION TO BE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE.

**9.** NON-INCENDIVE FIELD WIRING METHODS MAY BE USED FOR CONNECTING THE TEMPERATURE SENSING ASSEMBLY. WHEN USING NON-INCENDIVE FIELD WIRING, THE CONNECTION HEAD AND TEMPERATURE SENSOR ASSEMBLY NEED NOT BE EXPLOSION PROOF, BUT ALL COMPONENTS CONNECTED TO THE TEMP SENSOR CONNECTOR MUST BE CLASSIFIED "SIMPLE APPARATUS". SIMPLE APPARATUS ARE DEVICES WHICH ARE INCAPABLE OF GENERATING OR STORING MORE THAN 1.2V, 0.1A, 25MW, OR 20uJ (RTD'S QUALIFY AS SIMPLE APPARATUS).

**8.** DIVISION 2 WIRING METHOD.

**6.** CLASS II INSTALLATIONS MUST USE A CSA APPROVED DUST-IGNITIONPROOF SENSOR.

**5.** IN AMBIENTS GREATER THAN 40°C, SPRING LOADED TEMPERATURE SENSORS USED WITHOUT AN EXPLOSION PROOF THERMOWELL MUST BE RATED FOR AT LEAST 85°C.

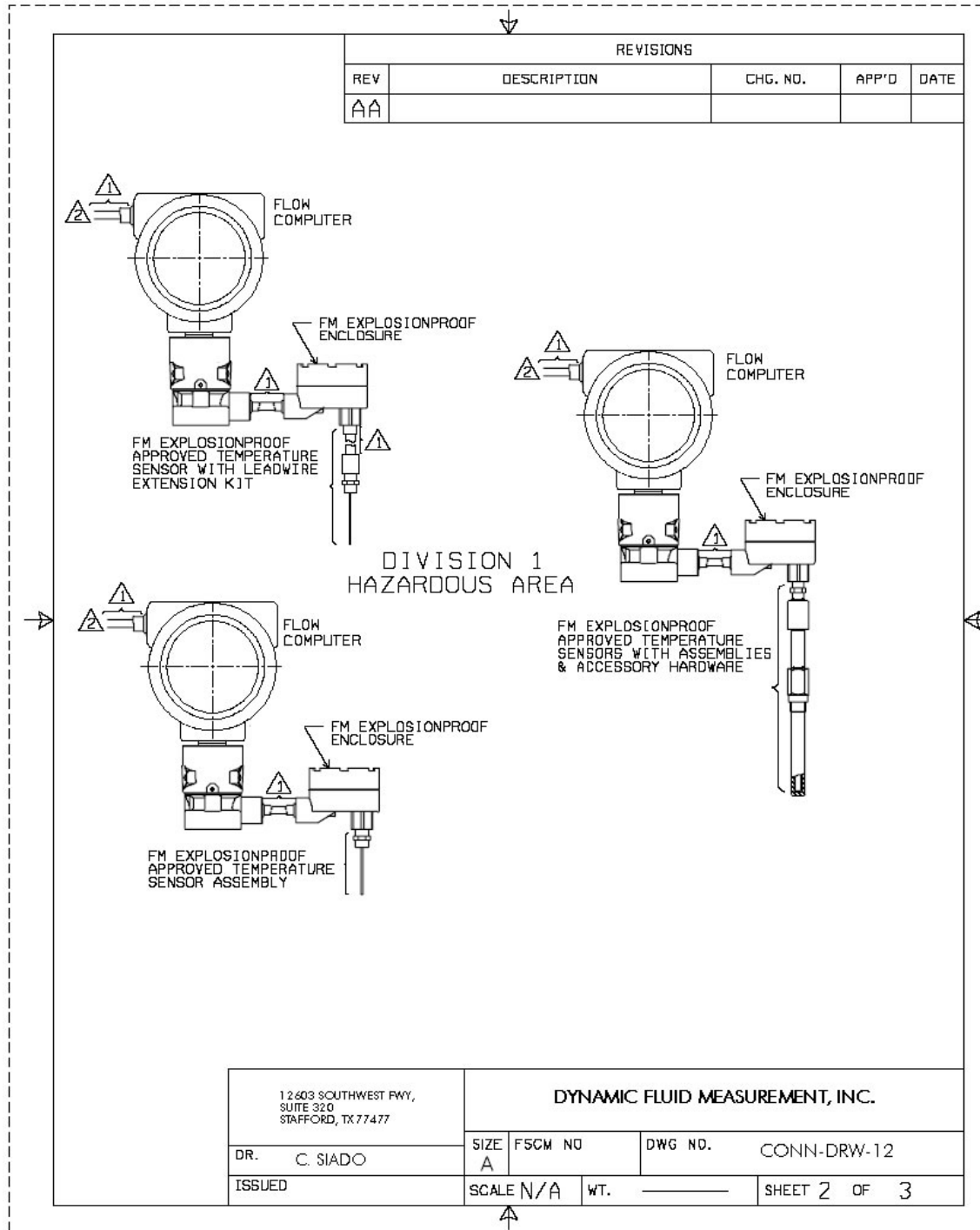
**4.** COMPONENTS REQUIRED TO BE APPROVED MUST BE FOR GAS GROUP APPROPRIATE TO AREA CLASSIFICATION.

**3.** ALL CONDUITS THREADS TO BE ASSEMBLED WITH FIVE FULL THREADS MINIMUM.

**2.** TRANSMITTER MUST NOT BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250VAC.

**1.** WIRING METHOD SUITABLE FOR CLASS I, DIV 1, ANY LENGTH.

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES (mm). REMOVE ALL BURRS AND SHARP EDGES, MACHINE SURFACE FINISH 125	CONTRACT NO.	<b>DYNAMIC FLUID MEASUREMENT, INC.</b>		12603 SOUTHWEST FWY, SUITE 320 STAFFORD, TX 77477
	DR. C. SIADO	TITLE MODEL MICROMV AND ECHART EXPLOSIONPROOF INSTALLATION DRAWING, FACTORY MUTUAL		
CHK'D				
	APP'D. S. HALILAH	SIZE A	FSCM NO	DWG NO. CONN-DRW-12
-TOLERANCE- .X * .1 [2.5] .XX * .02 [0.5] .XXX * .010 [0.25] FRACTIONS ANGLES * 1/32 * 2° DO NOT SCALE PRINT	APP'D. GOVT.	SCALE	WT. _____	SHEET 1 OF 3



REVISIONS				
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12603 SOUTHWEST FWY, SUITE 320 STAFFORD, TX 77477		<b>DYNAMIC FLUID MEASUREMENT, INC.</b>		
DR. C. SIADO	SIZE A	F5CM NO	DWG NO.	CONN-DRW-12
ISSUED	SCALE N/A	WT. _____	SHEET 2 OF 3	