

Sign-In Roster

Site-Visit Conference: "Construct New Mental Health Facility" Project #557-380

Date: March 22, 2016

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QUESTION:

We did not see spec 23 09 11 included in the documents, which it usually is for this type of project. Do you know if this spec will be associated with this project?

ANSWER:

VA specification 23 09 11 "Instrumentation and Control for Boiler Plant" is typically used for Central Energy Plants. It is inapplicable for this project's small heating water boilers.

QUESTION:

The following specs call for meters (see below)... can you please tell me which drawings has the meter schedule and info? I was unable to find it. -- I am assuming that the meter needs for vortex, turbine and mag are new not existing meters since this is a new construction project... is this valid?

23 09 23

B. Water flow sensors:

1. Type: Insertion vortex type with retractable probe assembly and 2

IN full port gate valve. a. Pipe size: 3 to 24 IN.

b. Retractor: ASME threaded, non-rising stem type with hand wheel.

c. Mounting connection: 2 IN 150 PSI flange.

d. Sensor assembly: Design for expected water flow and pipe size. e. Seal: Teflon (PTFE).

2. Controller:

a. Integral to unit.

b. Locally display flow rate and total.

c. Output flow signal to BMCS: Digital pulse type.

3. Performance:

a. Accuracy: 1.0% of reading

b. Repeatability: 0.15% of reading c. Turndown: 20:1

d. Response time: Adjustable from 1 to 100 seconds.

e. Power: 24 volt DC

4. Manufacturer: Emco V-Bar 910

5. Install flow meters according to manufacturer's recommendations.

Where recommended by manufacturer because of mounting conditions, provide flow rectifier.

C. Water Flow Sensors:

1. Sensor shall be insertion turbine type with turbine element, retractor and preamplifier/transmitter mounted on a two-inch full port isolation valve; assembly easily removed or installed as a single unit under line pressure through the isolation valve without interference with process flow; calibrated scale shall allow precise positioning of the flow element to the required insertion depth within plus or minus 1 mm (0.05 inch); wetted parts shall be constructed of stainless steel. Operating power shall be nominal 24

VDC. Local instantaneous flow indicator shall be LED type in NEMA 4 enclosure with 3-1/2 digit display, for wall or panel mounting.

2. Performance characteristics:

- a. Ambient conditions: -40 to 60 degrees C (-40 to 140 degrees F), 5 to 100 percent humidity.
- b. Operating conditions: 850 kPa (125 psig), 0 to 120 degrees C (30 to 250 degrees F), 0.15 to 12 m per second (0.5 to 40 feet per second) velocity.
- c. Nominal range (turn down ratio): 10 to 1.
- d. Overall accuracy plus or minus one percent of reading.
- e. Repeatability: plus or minus 0.25 percent of reading.
- f. Preamplifier mounted on meter shall provide 4-20 ma divided pulse output or switch closure signal for units of volume or mass per a time base. Signal transmission distance shall be a minimum of 1,800 meters (6,000 feet).
- g. Pressure Loss: Maximum 1 percent of the line pressure in line sizes above 100 mm (4 inches).
- h. Ambient temperature effects, less than 0.005 percent calibrated span per degree C (degree F) temperature change.
 - i) RFI effect - flow meter shall not be affected by RFI.
 - j) Power supply effect less than 0.02 percent of span for a variation of plus or minus 10 percent power supply.

2.3 AIR FLOW CONTROL VALVE

H. Airflow measuring devices and airflow control devices that are not venturi valves (e.g., Pitot tube, flow cross, air bar, orifice ring, vortex shedder, etc.) are acceptable, provided the following conditions are met:

- 1. They meet the performance and construction characteristics stated throughout this section of the specification.

2. Suppliers of airflow control devices or airflow measuring devices requiring minimum duct diameters: provide revised duct layouts showing the required straight duct runs upstream and downstream of these devices.
3. Supplier of the airflow control system: submit coordination drawings reflecting these changes and include static pressure loss calculations as part of submittal.

2.7 WATER AND GAS METER DEVICES

A. Water and gas meter applications:

1. Natural Gas Meters: provide vortex-shedding flowmeters with pressure sensors.
2. Potable (Domestic) Water: provide a magnetic flowmeter in new installations.

B. Associated Devices (to provide outside air conditions):

1. Temperature Sensors: Resistance Temperature Device (RTD) with an integral transmitter type.
 - a. Immersion sensors shall be provided with a separable thermowell. Pressure rating of well is to be consistent with the system pressure in which it is to be installed.
 - b. Outdoor air temperature sensors shall have watertight inlet fittings and be shielded from direct sunlight.
 - c. Output Signal: 4-20 ma or digital.
2. Humidity Sensors: Bulk polymer sensing element type.
 - a. Outdoor humidity sensors shall be furnished with element guard and mounting plate and have a sensing range of 0 to 100 percent RH.
 - b. Output Signal: 4-20 ma continuous output signal.

3.

C. Vortex-shedding flowmeters.

1. Meter shall have an all-welded flanged 316 stainless steel meter body with no seals. No sensor parts shall be exposed to the flow stream. Provide a 316 stainless steel trapezoidal shedder bar, sensing by detecting stresses in the shedder bar caused by vortices, and dual piezoelectric crystals located outside the process flow sense the shed vortices (dual crystal alignment cancels effects of noise and vibration). Design meter for Schedule 40 piping.
 - a. Meter shall be suitable for 25% warmer than the fluid operating temperature and for 25% higher than either the fluid's operating pressure or 25% higher than the piping system's safety valve set pressure, whichever is higher.
 - b. Meter flanges shall be Class 300 or higher, if required by the piping system's temperature and pressure Class.

c. Meter shall be suitable for installation in ambient conditions ranging from -29 to 60 degrees C (-20 to 140 degrees F).

2. Provide meter data head.

a. Meters shall have digital readout of pressure-compensated flow rate and totalization located at transmitter and transmit flow rate and totalization digital signals to the Site Data Aggregation Device and recorders.

As an option, pressure compensation and the compensated flow rate may be performed and displayed by the Site Data Aggregation Device receiving signals from the flow meter and from a pressure transmitter.

b. Provide programmable microprocessor electronics with on-board programming. Output signals shall be immune to ambient temperature swings. Processor shall include continuous self-diagnostic routines that identify electronics problems and provide a warning. Electronics shall be replaceable in the field without affecting metering accuracy. Provide power supply as recommended by meter manufacturer. Mount electronics in a NEMA 4 enclosure separate from meter body in position accessible from platform or floor without the use of a portable ladder.

1) Power supply to meter and transmitter shall be 120V/60hz.

Provide a Class 2 control voltage transformer for 24VDC power to meter as needed.

2) Provide an internal battery, provided for 24-month retention of RAM contents when all other power sources are removed.

3. Performance:

a. Transmitted signal from flowmeter and its transmitter shall have a total (rms) accuracy plus or minus 1.5% of flow rate.

b. Flowmeter accuracy shall be no more than plus or minus 1% of span for gasses and plus or minus 0.7% of span for liquids.

Flowmeter repeatability shall be no more than 0.2% of actual flow rate. Meter shall be designed to minimize vibration effect and to provide elimination of this effect.

c. Minimum turndown ratio shall be 20:1 for gasses and liquids.

Maximum fluid pressure drop shall be as scheduled. D. Magnetic flowmeters.

1. Meter shall have an all-welded flanged 316 stainless steel engineered flow tube with no seals. No sensor parts shall be exposed

to the flow stream. Design meter for mating with Schedule 40 piping.

- a. Meter shall be suitable for 25% warmer than the fluid operating temperature and for 25% higher than either the fluid's operating pressure or 25% higher than the piping system's safety valve set pressure, whichever is higher.
- b. Meter flanges shall be Class 150 or higher, if required by the piping system's temperature and pressure Class.
- c. Meter shall be suitable for installation in ambient conditions ranging from -29 to 60 degrees C (-20 to 140 degrees F).

2. Provide meter data head.

- a. Meters shall have digital readout of pressure-compensated flow rate and totalization located at transmitter and transmit flow rate and totalization digital signals to the Site Data Aggregation Device and recorders. As an option, pressure compensation and the compensated flow rate may be performed and displayed by the Site Data Aggregation Device receiving signals from the flow meter and from a pressure transmitter.
- b. Provide programmable microprocessor electronics with on-board programming. Output signals shall be immune to ambient temperature swings. Processor shall include continuous self-diagnostic routines that identify electronics problems and provide a warning. Electronics shall be replaceable in the field without affecting metering accuracy. Provide power supply as recommended by meter manufacturer. Mount electronics in a NEMA 4 enclosure separate from meter body in position accessible from platform or floor without the use of a portable ladder.

1) Power supply to meter and transmitter shall be 120V/60hz.

Provide a Class 2 control voltage transformer for 24VDC power to meter as needed.

3. Performance:

- a. Transmitted signal from flowmeter and its transmitter shall have a total (rms) accuracy plus or minus 1.5% of flow rate.
- b. Flowmeter accuracy shall be no more than plus or minus 1.5% of actual flow rate for gasses and plus or minus 1% of actual flow rate for liquids. Flowmeter repeatability shall be no more than 0.2% of actual flow rate. Meter shall be designed to minimize vibration effect and to provide elimination of this effect.
- c. Minimum turndown ratio shall be 20:1 for gasses and liquids.

Maximum fluid pressure drop shall be as scheduled.

<https://www.fbo.gov/index?s=opportunity&mode=form&id=e393ce1844079f1e006be3d013cf4e71&tab=core&cvview=1>

ANSWER:

Per our Mechanical Engineer, the response to the question is as follows:

Meters are control systems devices; so, they do not appear on separate schedules. However, they are indicated in the M700 series drawings, along with other control system devices.

As this is new construction, all metering equipment and requirements are new.