

Mechanical – Purchase Specs

23 05 19.51 Gas Meter – Purchase Spec

PART 1 – GENERAL

1.01 DESCRIPTION

A. Purpose

1. This section covers gas meters and sub-meters for use in the Owner's systems.

1.02 QUALIFICATIONS

A. Approved manufacturers

1. UW Gas Main Meter for up to 1 1/2" C
 - a. American Meter – AL-1000
 - b. Or approved equal
2. UW Gas Main Meter for 2" or Larger
 - a. American Meter
 - b. Dresser Measurement
3. UW Gas Sub-Meter
 - a. To be determined
4. Twisted-pair shielded cable
 - a. Belden 88760
 - b. Or Approved Equal
5. PSE Gas Meter
 - a. Provided by PSE

1.03 RELATED SECTIONS

- A. 01 91 00 – General Commission Requirements
- B. 23 08 00.11 – Mechanical Meter Integration and Commissioning
- C. 26 09 13.11 – Data Collection Controller

1.04 REFERENCES

- A. Applicable codes, standards, and references codes, regulations and standards

1. ANSI B109.1 Diaphragm-Type Gas Displacement Meters (under 500 cubic feet per hour capacity)
2. ANSI B109.2 Diaphragm-Type Gas Displacement Meters (500 cubic feet per hour and over)
3. ANSI B109.3 Rotary-Type Gas Displacement Meters
4. UL 61010-1 Electrical Equipment for Measurement, Control and Laboratory Use
5. NEMA 4X/6P (IP66/IP67)
6. State and local codes and ordinances

1.05 COORDINATION

- A. Coordinate Operations and Maintenance training times with the Owner.
- B. Contractor shall provide a completed "Mechanical Meter Profile Report" form per Specification 23 08 00.11 Appendix A for each meter.

1.06 SUBMITTALS

- A. General
 1. Submittals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.
 2. Submit detailed maintenance manuals and drawings, which include catalog information indicating the complete electrical and mechanical characteristics.
 3. Submit dimensioned cross-sectional drawings (manufacturer's data sheets are acceptable).
 4. Submit finished meter tests – Manufacturer's Certified Test Reports showing accuracy tests

1.07 OPERATIONS AND MAINTENANCE (O&M) MANUALS

- A. Operations and Maintenance Manuals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.
- B. Operations and Maintenance Manuals shall include catalog information indicating complete electrical and mechanical characteristics.
- C. Manufacturer's Certified Test Reports
- D. Manufacturer's drawings of meter wiring diagram.

1.08 MEETINGS

- A. Pre-installation conference
 1. The Contractor shall request a pre-installation conference with the UW Engineering Services for UW projects
- B. Attend meetings with the Owner and/or Owner's Representative as required to resolve any installation or functional problems.

PART 2 - PRODUCTS

2.01 GENERAL

- A. These gas meter specifications are in accord with the Owner's policy to construct permanent installations with long life, coupled with maximum reliability and safety.

2.02 GAS METER

- A. The following shall apply to the UW gas meters installed on the UW Campus:
 1. Gas meter shall use a hybrid analog/digital thermal mass flow sensing method.
 2. Gas meter shall have the following accuracy for natural/propane gas:
 - a. +/- 1.0% of reading from 500 to 7000 SFPM
 - b. +/- 2.0% of reading from 100 to 500 SFPM
 3. Gas meter shall be wet calibrated in a flow laboratory. A certificate of calibration shall accompany each meter.
 4. Gas meter shall have an overall flow range of 5 to 35,000 SFPM.
 5. Gas meter shall accommodate fluid temperature range of -40 to 200° F
 6. Gas meter shall have digital display for local monitoring
 7. Gas meter electronics shall be housed in a NEMA 4X enclosure. Meter electronics shall be mounted remotely when direct wiring is not feasible.
 8. Gas meter shall be suitable ambient temperatures of 0 to 150° F.
 9. Gas meter connections shall be as follows:
 - a. Diaphragm style meters shall be threaded.
 - b. Rotary meters shall have meter body flanges.
 10. Gas meter shall accommodate a 120V AC source.
 11. Gas meter shall be capable of operating at 60 PSIG MAOP, with the option for operating in pressures up to 100 PSIG MAOP.
 12. Gas meter shall accommodate a delivery pressure of 10 inches of water column.
 13. Gas meter shall have a maximum pressure drop of 0.5" w.c. in pipe sizes above 1-1/2" diameter, and less than 0.9" w.c. for pipe diameters of 1-1/2" and below.
 14. Gas meter shall have a digital pulse output.
 15. Gas meter shall be constructed of die cast aluminum, diaphragms shall be made of Buna-N rubber.

PART 3 - EXECUTION

3.01 REQUIREMENTS

- A. General installation
 1. Identification

- a. Reference section 23 05 53 Identification of Mechanical Piping and Equipment
2. Installation
 - a. Only personnel qualified and experienced in this type of work shall make connections.
 - b. The installation of meters shall be done with care to avoid damage.
 - i. Meters showing damage after installation shall be replaced.
 - ii. Meters shall have adequate clearance to service, repairs, and replacement.
 - c. Provide adequate pipe diameters upstream and downstream of installed meter. See Manufacturer's recommendations.
 - d. Rotary meters shall have a filter installed before the intake of the meter.
 - e. Each gas meter shall have dedicated twisted shielded pair communication cable installed to connect the meter's digital pulse port to the Data Collection Controller.
 - f. Meters shall be installed such that the odometer can be easily read.
 - g. Provide appropriate installation kit based upon pipe material.
 - h. Provide adequate slack in flexible communication conduit to allow for the removal of the flow meter.
3. UW will check the Contractor's work to ensure the accuracy of the installation.
 - a. The Contractor shall arrange with the Owner for the times when their services will be required, and under no circumstances shall the Contractor connect to the existing system without Owner's knowledge.
 - b. The proper connection of the wires and cables to other systems as specified is entirely the responsibility of the Contractor.
 - c. In the event the connections cannot be made as specified, the Contractor shall make the necessary corrections at his own expense.
4. Install meters per manufacturer's recommendations.
5. Meter shall be UL Listed from manufacture or shall be field listed.
- B. Mounting and electrical connections
 1. In accordance with manufacturer's installation instructions.
 2. Install a dedicated 24V circuit from the Data Collection Controller to provide power to the meter.
 3. 24V circuit shall be THWN or XHHW insulation and installed in a rigid conduit to a junction box located next to the meter. A flexible conduit shall be connected from the junction box to the meter with enough slack to allow for removal of the meter.
- C. Testing
 1. Contractor to verify meter is reading accurately.
- D. Integration and Commissioning
 1. See section 23 08 00.11 Meter Integration and Commissioning