

SECTION 16930

INSTRUMENTS AND ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Level Transmitters.
- B. Rain Gauge.
- C. Backup Float Switch.

1.2 RELATED SECTIONS

- A. Section 16160 - Cabinets and Enclosures: Cabinets and terminal blocks.
- B. Section 16902 - Electric Controls and Relays.
- C. Section 16903 - Programmable Controllers.
- D. Section 16940 - Sequence of Operations.

1.3 REFERENCES

- A. NEMA ICS 1 - General Standards for Industrial Control Systems.
- B. NEMA ICS 2 - Standards for Industrial Control Devices, Controllers and Assemblies.
- C. NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
- D. NEMA ST 1 - Standard for Specialty Transformers (Except General Purpose Type).

1.4 SUBMITTALS

- A. Submit shop drawings to NEMA ICS 1 indicating instrument wiring connections and diagrams, dimensions, and support points.
- B. Submit product data for each component specified.
- C. Submit manufacturer's installation instructions and manufacturer's certificate under provisions of Section 01400 – Quality Control that products meet or exceed specified requirements.
- D. Include instructions for adjusting and resetting transmitters and controllers.
- E. Include recommended preventive maintenance procedures and materials.
- F. Submit electronic files for all CAD produced shop drawings.

1.5 PROJECT RECORD DOCUMENTS

- A. Submit record documents under provisions of Section 01700 – Contract Closeout.
- B. Accurately record locations of controller cabinets and sensors. Include interconnecting wiring and cabling information, and terminal block layouts in controller cabinets.

1.6 QUALIFICATIONS

- A. Manufacturer: company specializing in manufacturing the products specified in this Section with minimum three years experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Section 01600 – Material and Equipment.
- B. Store and protect products under provisions of Section 01600 – Material and Equipment.
- C. Accept products on site in factory containers and verify damage.
- D. Store Products in clean, dry area; maintain temperature to NEMA ISC1.

1.8 MAINTENANCE SERVICE

- A. Provide maintenance services for instruments for one year from Date of Substantial Completion.

PART 2 PRODUCTS

1.9 LEVEL TRANSMITTERS:

- A. Manufacturer: Ohmart Vega.
- B. Options:
  - 1. Measuring Range: 0.5 - 35 m.
  - 2. Connection: 4-inch flange.
  - 3. Electronics Housing: NEMA 4 & 7.
  - 4. Measuring Principle: radar.
  - 5. Signal Output: 4-20 mA.
  - 6. Horn antenna.
  - 7. Input power +24VDC. ? 25%, 1.5 Watts.
  - 8. No FCC license required.

1.10 Rain Gauge (B only)

- A. Provided by Owner.

1.11 Float Switches

- A. Manufacturer: ABS Pumps, Inc; Substitutions under provisions of Section 01600 – Material and Equipment.
  - 1. Mercury float.
  - 2. Model: #3288881.

### PART 3 EXECUTION

#### 1.12 EXAMINATION

- A. Verify that all surface are ready to receive work and sensors will not be damage by additional construction.
- B. Verify field measurements are shown on the plans or instructed by manufacturer.
- C. Verity that all required utilities are available, in proper location, and read for use.
- D. Beginning of installation means installer accepts conditions.

#### 1.13 INSTALLATION

- A. Install instrumentation in accordance with manufacturer's instructions.
- B. Install all sensors at verified locations, in accordance with the plans, and in a manner that shall permit them to function as designed.
- C. Level Transmitters:
  - 1. Install exterior sensors in still pipes per drawing detail. Pipe shall be stainless steel conduit sized per manufacturers instructions and the plans.
  - 2. Install in the location indicated on the plans. Verify locations and connections.
  - 3. Connect field instruments to proper control panel terminals. Verify locations and connections.
  - 4. Connect to power supply.
- D. Rain gauge:
  - 1. Connect to PLC's high-speed counting module and power supply per Manufacturer's instructions and per plans.
- E. Float Switch:
  - 1. Install float switch to keep pumps from running at or below a pump well level of elevation as determined by the Engineer.
  - 2. Confirm operation of switch.

#### 1.14 TESTING AND CALABRATION

- A. Verify each instrument produces an appropriate output current.
- B. Calibrate instruments per manufactures instructions and to give accurate readings.
- C. Provide documentation of procedures used and the results of the procedures.
- D. Calibrate instruments to display level in terms of elevation.

1.15 DEMONSTRATION AND TRAINING

- A. Provide training for a minimum of 2 hours minimum, at each site of installation, of training for items listed in this Section to Owner's personnel and engineer giving one-week prior notice.
- B. Items in this section are to be included in factory system wide test in accordance with Section 16902 – Electric Controls and Relays and Section 16903 – Programmable Controllers.

END OF SECTION