

## **PART 1 GENERAL**

### **1.1 REFERENCE STANDARDS**

- .1 American National Standards Institute (ANSI).
  - .1 ANSI C12.7 (Latest Edition), Requirements for Watthour Meter Sockets.
  - .2 ANSI/IEEE C57.13 (Latest Edition), Standard Requirements for Instrument Transformers.
- .2 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM B 148 (Latest Edition), Standard Specification for Aluminum-Bronze Sand Castings.
- .3 National Electrical Manufacturer's Association (NEMA).
  - .1 NEMA 250 (Latest Edition), Enclosures for Electrical Equipment (1000 Volts Maximum).
- .4 Air Movement and Control Association, Inc. (AMCA).
  - .1 AMCA Standard 500-D (Latest Edition), Laboratory Method of Testing Dampers for Rating.
- .5 Canadian Standards Association (CSA International).
  - .1 CSA-C22.1 (Latest Edition), Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.

### **1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit shop drawings and manufacturer's installation instructions in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Pre-Installation Tests.
  - .1 Submit samples at random from equipment shipped, as requested by Departmental Representative, for testing before installation. Replace devices not meeting specified performance and accuracy.
- .3 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions for specified equipment and devices.

### **1.3 EXISTING CONDITIONS**

- .1 Cutting and Patching: in accordance with Section 01 73 00 - Execution supplemented as specified herein.
- .2 Repair surfaces damaged during execution of Work.
- .3 Turn over to Departmental Representative existing materials removed from Work not identified for re-use.

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**PART 2 PRODUCTS**

**2.1 GENERAL**

- .1 Control devices of each category to be of same type and manufacturer.
- .2 Terminations: use standard conduit box with slot screwdriver compression connector block unless otherwise specified.
- .3 Transmitters and sensors to be unaffected by external transmitters including walkie talkies.

**2.2 STAND ALONE CO2 SENSOR**

- .1 Wall mount with LCD display.
- .2 Electrical: 24 VAC.
- .3 Range: 0-2000 ppm.
- .4 Audible alarm: 80 dB, minimum.

**2.3 NO2 TOXIC GAS SENSORS**

- .1 Electrochemical sensing element.
- .2 Output signal: 4-20 mA compatible with gas sensor control panel.
- .3 Range: 0-10 ppm.

**2.4 CO TOXIC GAS SENSORS**

- .1 Electrochemical sensing element.
- .2 Output signal: 4-20 mA, compatible with gas control panel.
- .3 Range: 0-100 ppm.

**2.5 GAS DETECTION SYSTEM**

- .1 General: Gas detection system consisting of alarm panel and remote sensors for carbon monoxide and nitrogen dioxide toxic gases, *and gas calibration equipment.*
- .2 Control Panel:
  - .1 Enclosure: steel, wall-mounted NEMA 1 enclosure 210 mm high x 210 mm wide x 102 mm deep
  - .2 Status readouts: LED display indicating the following:
    - .1 Power (green)
    - .2 Warning (amber)
    - .3 Alarm (red)

- .4 Sensor status - Normal (green)
- .5 Sensor status - Abnormal (red)
- .3 Digital readouts: 4-digit LED display, indicating channel # and concentration.
- .4 Alarms:
  - .1 Visual: red strobe, mounted on control panel, manual reset.
  - .2 Audible: audible alarm, 93 dB at 0/3 m with solid or warbling user-selected options, manual reset.
- .5 Inputs: minimum one NO<sub>2</sub> sensor channels and one CO sensor channels, compatible with sensor output signals.
- .6 Outputs:
  - .1 4-20 mA warning signal and alarm signal to control exhaust fans operation.
  - .2 4-20 mA alarm signal for future connection.
- .7 Electrical requirements: 120/1/60.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- .1 Install equipment, components so that manufacturer's and CSA labels are visible and legible after commissioning is complete.
- .2 Install field control devices in accordance with manufacturer's recommended methods, procedures and instructions.
- .3 Support field-mounted panels, transmitters and sensors on pipe stands or channel brackets.
- .4 Fire stopping: provide space for fire stopping in accordance with Section 07 84 00 - Firestopping. Maintain fire rating integrity.
- .5 Electrical:
  - .1 Complete installation in accordance with Section 26 05 00 - Common Work Results for Electrical.
  - .2 Refer to electrical control schematics included as part of control design schematics on drawings. Trace existing control wiring installation and provide updated wiring schematics including additions, deletions to control circuits for review by Departmental Representative before beginning Work.
  - .3 Terminate wires with screw terminal type connectors suitable for wire size, and number of terminations.
  - .4 Install communication wiring in conduit by Division 23.
    - .1 Conduit sizes to suit wiring requirements and to allow for future expansion capabilities specified for systems.
    - .2 Maximum conduit fill not to exceed 40%.
    - .3 Design drawings do not show conduit layout.

- .5 Do not run exposed conduits in normally occupied spaces unless otherwise indicated or unless impossible to do otherwise. Departmental Representative to review before starting Work. Wiring in mechanical rooms, wiring in service rooms and exposed wiring must be in conduit.

### **3.2 IDENTIFICATION**

- .1 Identify field devices in accordance with Section 23 05 53.01 - Mechanical Identification.

### **3.3 TESTING AND COMMISSIONING**

- .1 Calibrate and test field devices for accuracy and performance in accordance with manufacturer's recommendations.

**END OF SECTION**