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**Part 1**      **General****1.1**      **RELATED SECTIONS**

- .1 Section 01 00 10 – General Instructions.
- .2 Section 07 84 00 - Firestopping.
- .3 Section 25 01 11 - EMCS: Start-Up, Verification and Commissioning.
- .4 Section 25 05 01 - EMCS: General Requirements.
- .5 Section 25 05 02 - EMCS: Shop Drawings, Product Data and Review Process.
- .6 Section 25 05 54 - EMCS: Identification.
- .7 Section 25 05 60 – EMCS: Field Installation.
- .8 Section 25 90 01 - EMCS: Site Requirements Applications and Systems Sequences of Operation.
- .9 Section 26 05 00 - Common Work Results for Electrical.

**1.2**      **REFERENCES**

- .1 Canadian Standards Association (CSA International).
  - .1 CSA-C22.1-12, Canadian Electrical Code, Part 1 (22<sup>nd</sup> Edition), Safety Standard for Electrical Installations.

**1.3**      **DEFINITIONS**

- .1 Acronyms and Definitions: refer to Section 25 05 01 - EMCS: General Requirements.

**1.4**      **SUBMITTALS**

- .1 Submit shop drawings and manufacturer's installation instructions in accordance with Section 25 05 02 - EMCS: Submittals and Review Process.
- .2 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions for specified equipment and devices.

**Part 2**      **Products****2.1**      **GENERAL**

- .1 Control devices of each category to be of same type and manufacturer.
- .2 Operating conditions: 0 - 50 degrees C with 10 - 90% RH (non-condensing) unless otherwise specified.
- .3 Terminations: use standard conduit box with slot screwdriver compression connector block unless otherwise specified.

- .4 Transmitters and sensors to be unaffected by external transmitters including walkie-talkies.
- .5 Account for hysteresis, relaxation time, maximum and minimum limits in applications of sensors and controls.

## **2.2 TEMPERATURE SENSOR - T**

- .1 General: to be resistance type to following requirements:
  - .1 RTD's: 1000 or 10,000 ohm platinum element with strain minimizing construction. Coefficient of resistivity: 0.00385 ohms/ohm degrees C.
  - .2 Sensing element: hermetically sealed.
  - .3 Stem and tip construction: copper or type 304 stainless steel.
  - .4 Time constant response: less than 3 seconds to temperature change of 10°C.
- .2 Room temperature sensors.
  - .1 Wall mounting, in slotted type covers.
  - .2 Separate mounting base.
  - .3 Element accuracy of plus or minus 0.2 degrees C.

## **2.3 TRANSFORMER (LOW VOLTAGE)**

- .1 Single phase transformer, enclosed type complete with fuse holder and fuse. Capacity in VA of each transformer must be at least 20% greater than the rated charge to be connected.

## **2.4 ELECTROMECHANICAL RELAYS - R**

- .1 Requirements:
  - .1 4PDT, plug-in type with termination base and LED status indicators.
  - .2 Coils: rated for 120V AC or 24V DC.
  - .3 Contacts: rated at 10 amps at 120 V AC.
  - .4 In applications where relay is subject to vibration, provide hold-on clips.

## **2.5 LOCAL CONTROL PANEL - CP**

- .1 Unitized Cabinet type, 610 mm x 815 mm x 205 mm complete with key-lockable front door mounted on concealed hinges, easily removable to provide interior access. Installed on rigid support for mounting on wall, floor, ceiling or ductwork.
- .2 Locate to provide a minimum clearance of 1000 mm (40") in front of panel.
- .3 All controls equipment including relays, switches, fuses, terminal blocks, etc., to be installed inside the panel. Push buttons, pilot lights, selector switches, filter pressure indicators, etc., to be surface mounted on the panel's front door. All wiring shall be inside raceways of adequate size with 40% of free space.
- .4 Control panel and all its associated equipment, field devices, wiring and pneumatic tubing must be identified in accordance with Section 25 05 54 – EMCS: Identification.
- .5 Supply and install a manual switch inside the panel for the 120V power supply.

- .6 Terminal blocks:
  - .1 All joints and connections inside the panel must be done on screw-type terminal blocks.
  - .2 Industrial grade modular type terminal blocks, DIN-rail mounted with vibration proof screw connections and color coded labelled terminals and voltage and current separators.
  - .3 Supply and install on the interior of the panel's front door, a detailed schematic drawing of the system's arrangement, including all wiring and devices identification. Schematic drawing to be sealed in a transparent plastic.

## 2.6 UNINTERRUPTIBLE POWER SUPPLY (UPS)

- .1 Each standalone digital controller (SDC) is connected to emergency power via an uninterruptible power supply.
- .2 In addition, power supply management system can provide the following functions:
  - .1 Scheduled shutdown following a power failure, in order to close applications/software and allow data saving.
  - .2 Independent control of connected loads.
  - .3 System shutdown and restart based on a programmed schedule.
  - .4 Sequential start-up for components powered by the system.
  - .5 Restart sequentially component powered by the system.
  - .6 Regulated power supply.
  - .7 Monitor and trigger power supply alarms.
  - .8 Perform routine verifications of system, including batteries and generation of alarms in case of system failure or faults.
- .3 The uninterruptible power supply unit shall be able to provide power to connected equipment for a minimum of 15 minutes. The unit has the following features:
  - .1 Power supply : 120 V A.C.
  - .2 Output : minimum extra capacity of 15%, dependant of the connected load.
  - .3 On line double conversion type.
  - .4 Batteries can be replaced while the unit is operational.
  - .5 Line regulation : -10% to + 6%.
  - .6 Rechargeable acid/lead batteries, maintenance-free.
  - .7 Battery life expectancy: three to six years.
  - .8 Three years extended warranty on system and battery.

## 2.7 WIRING

- .1 In accordance with Section 25 05 60 – EMCS: Field Installation.

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**Part 3 Execution****3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

**3.2 INSTALLATION**

- .1 In accordance with Section 25 05 60 – EMCS: Field Installation.
- .2 Install equipment, components so that manufacturer's and CSA labels are visible and legible after commissioning is complete.
- .3 Install field control devices in accordance with manufacturers recommended methods, procedures and instructions.
- .4 Support field-mounted panels, transmitters and sensors on pipe stands or channel brackets.
- .5 Fire stopping: provide space for fire stopping in accordance with Section 07 84 00 - Firestopping. Maintain fire rating integrity.
- .6 Electrical:
  - .1 Complete installation in accordance with Section 25 05 01 – EMCS: General Requirements and Section 26 05 00 –Common Work Results for Electrical.
  - .2 Terminate wires with screw terminal type connectors suitable for wire size, and number of terminations.

**3.3 TEMPERATURE AND HUMIDITY SENSORS**

- .1 Stabilize to ensure minimum field adjustments or calibrations.

**3.4 PANELS**

- .1 Arrange for conduit and tubing entry from top, bottom or either side.
- .2 Wiring and tubing within panels: locate in trays or individually clipped to back of panel.
- .3 Identify wiring and conduit clearly.

**3.5 IDENTIFICATION**

- .1 Identify field devices in accordance with Section 25 05 54 - EMCS: Identification.

**3.6 TESTING AND COMMISSIONING**

- .1 Calibrate and test field devices for accuracy and performance in accordance with Section 25 01 11 - EMCS: Start-up, Verification and Commissioning.

**END OF SECTION**