

AUTOMATION – PROCESS MEASUREMENT DEVICES (ADDENDUM 3)

1. GENERAL

1.1 Summary

.1 Section Includes:

.1 Process and HVAC instrumentation.

1.2 References

.1 National Electrical Manufacturers Association (NEMA).

.2 Canadian Standards Association (CSA International).

.3 Canadian Electrical Code (CEC).

.4 Canadian Underwriters Laboratory, Inc. (cUL).

.5 National Pipe Thread (NPT).

.6 International Protection Code (IP).

1.3 Submittals

.1 Submit Shop Drawings and manufacturer's installation instructions.

.2 Manufacturer's Instructions:

.1 Include manufacturer's installation instructions for specified equipment and devices in operation and maintenance manuals.

2. PRODUCTS

2.1 General

.1 Control devices of each category to be of same type and manufacturer.

.2 External trim materials to be corrosion resistant.

.3 Operating conditions: 0-35°C with 5-95% RH (non-condensing) unless otherwise specified for indoor components.

.4 All outdoor instrument and equipment to be rated for -40 to 40°C.

.5 Account for hysteresis, relaxation time, maximum and minimum limits in applications of sensors and controls.

2.2 Outdoor/Indoor Temperature Element and Transmitter (Wall mount)

.1 Requirements:

.1 Sensor:

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- .1 3- wire RTD, Pt100.
- .2 Probe length 120 mm.
- .3 Probe diameter 6.25 mm.
- .4 Measurement range: -200 to 850°C.
- .5 Protective sheath for external mounting.
- .2 Transmitter:
 - .1 Output signal: 4-20mA 2 wire with connection to HART.
 - .2 Accuracy: +/- 0.06°C.
- .3 Enclosure:
 - .1 Transmitter is housed in a NEMA4X wall mount electrical enclosure with temperature element mounted externally.
- .4 Operating Ambient Conditions:
 - .1 -40 to 85°C, 98% relative humidity with condensation.
- .5 Approvals: CSA or equivalent.
- .2 Acceptable Products:
 - .1 Siemens SITRANS TH300.
 - .2 This product was standardized by the City via RFP 449-2014.

2.3 HVAC Temperature Element and Transmitter (Pipe mount)

- .1 Requirements:
 - .1 Sensor:
 - .1 3- wire RTD, Pt100.
 - .2 Probe length 120 mm.
 - .3 Probe diameter 6.25 mm.
 - .4 Measurement range: -20 to 85°C.
 - .5 Insertion type element.
 - .2 Transmitter:
 - .1 Output signal: 4-20mA 2 wire with connection to HART.
 - .2 Accuracy: +/- 0.06°C.

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- .3 Enclosure:
 - .1 Transmitter is housed in a NEMA4X electrical enclosure with temperature element mounted.
- .4 Operating Ambient Conditions:
 - .1 -40 to 85°C, 98% relative humidity with condensation.
- .5 Thermowell:
 - .1 Process Connection: 19 mm NPT(M) unless otherwise noted.
 - .2 Material: 316 stainless steel.
 - .3 Insertion Length: 89 mm minimum immersion.
- .6 Approvals: CSA or equivalent.
- .2 Acceptable Products:
 - .1 Siemens SITRANS TH300 or Magnetrol Autrol Series,
 - .2 This product was standardized by the City via RFP 449-2014.

2.4 Room Temperature Element and Transmitter

- .1 Requirements:
 - .1 Sensor:
 - .1 Device box cover type 2- wire RTD, Pt100.
 - .2 Measurement range: 0 to 50°C.
 - .3 Stainless steel or Powder coated white steel.
 - .2 Transmitter:
 - .1 Output signal: 4-20mA 2 wire with connection to HART.
 - .2 Accuracy: +/- 0.06°C.
 - .3 Enclosure:
 - .1 Transmitter is housed in a NEMA4X electrical enclosure with temperature element mounted.
 - .4 Operating Ambient Conditions:
 - .1 -40 to 85°C, 98% relative humidity with condensation.
 - .5 Thermowell:
 - .1 Process Connection: 19 mm NPT(M) unless otherwise noted.

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- .2 Material: 316 stainless steel.
- .3 Insertion Length: 89 mm minimum immersion.
- .6 Approvals: CSA or equivalent.
- .2 Acceptable Products:
 - .1 Siemens SITRANS TH300.
 - .2 Or approved equal in accordance with B7.

2.5 HVAC Temperature Switches

- .1 Requirements:
 - .1 Functionality: Field adjustable with reference dials for each pole.
 - .2 Output: Qty 2, individually adjustable, DPDT dry contacts.
 - .3 Operating Temperature: -20 to 40°C minimum.
 - .4 Sensor: Local.
 - .5 Mounting: Duct.
 - .6 Enclosure Rating: NEMA Type 4X.
 - .7 Approvals: CSA or equivalent.
 - .8 Electrical Connections: Conduit: 19 mm NPT(F) unless otherwise noted.
 - .9 Material: 316 stainless steel.
- .2 Acceptable Products:
 - .1 Ashcroft B-Series.
 - .2 United Electric B402-120.
 - .3 Or approved equal in accordance with B7.

2.6 Thermostat for HVAC applications

- .1 General:
 - .1 Approvals: CSA or cUL.
 - .2 Industrial Grade.
 - .3 Type: Wall mount Thermostat.
- .2 Enclosure:
 - .1 Hazardous locations, Class I Zone 2, Groups C, D.

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- .2 Explosion proof.
- .3 Specifications:
 - .1 Temperature Rating: 2°C to 28°C
 - .2 Contact Type : SPDT, Snap Action.
 - .3 Electrical Rating: 120 VAC.
- .4 Conduit connection: ¾" – 14 NPT.
- .5 Manufacturer and Model:
 - .1 Ruffneck XT-312.
 - .2 Or approved equal in accordance with B7.

2.7 Temperature Gauge. Thermometer

- .1 General:
 - .1 Function: Indicate process temperature.
 - .2 Type: Bi-metallic, circular dial.
 - .3 Parts: Temperature gauge and thermowell.
- .2 Performance:
 - .1 Scale Range: As noted.
 - .2 Accuracy: 1% of full scale.
- .3 Thermometer Features:
 - .1 Stem Length: 100 mm, unless otherwise noted.
 - .2 Stem Type: Every angle, unless otherwise noted. Adjustable 90 degrees vertical, 360 degrees horizontal.
 - .3 Dial:
 - .1 Heavy-duty glass, unless otherwise noted.
 - .2 125 mm circular, unless otherwise noted.
 - .3 Hermetically sealed.
 - .4 Construction: All-welded, stainless steel.
- .4 Thermowell:
 - .1 Type: 13 mm NPT connection, Type 316 stainless steel.

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.2 Extension Neck: When noted, with length as noted.

.5 Manufacturers:

.1 Ashcroft.

.2 WIKA.

.3 Or approved equal in accordance with B7.

2.8 Flow Element and Transmitter, Electromagnetic

.1 No alternates or substitutes will be accepted.

.2 All requests for purchase or quotation shall reference RFP 449-2014 to receive standardized pricing that the City has negotiated with the vendor.

.3 Manufacturer and Model:

.1 Siemens MAG6000 transmitter.

.2 MAG3100 flow tube, unless shown otherwise.

.3 This product was standardized by the City via RFP 449-2014.

2.9 Flow Element and Transmitter, Thermal Mass Flow

.1 General:

.1 Approvals: CSA or cUL

.2 Function: Directly measure, indicate, and transmit the mass flow of the gas in the duct or pipeline.

.3 Type: Insertion type, thermal dispersion detection probe using platinum resistance temperature detectors (RTD).

.4 Parts: Element and transmitter.

.2 Performance:

.1 Flow Turndown: As noted, to 100:1.

.2 Accuracy: Plus or minus 1% of reading or 0.5% full scale.

.3 Temperature, Operating:

.1 Flow Element: -40 to +30°C, unless otherwise noted.

.2 Transmitter Housing: -40 to +30°C.

.4 Pressure, Operating, Flow Element: Up to 10 000 kPa, unless otherwise noted.

.5 Integral temperature compensation for process temperature variation.

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- .3 Flow Element:
 - .1 Features:
 - .1 Insertion Length: As noted or as required by manufacturer's recommendation.
 - .2 Wetted Surfaces Materials: Type 316 stainless steel, unless otherwise noted.
 - .2 Process Connections:
 - .1 Connection Type: Threaded 25 mm (1") NPT full bore ball valve.
 - .2 Connection Material: Type 316 stainless steel, unless otherwise noted.
 - .3 Sensor Termination Enclosure: Aluminum, NEMA 4X, rated for Hazardous locations, Class 1 Zone 2, Group IIA; unless otherwise noted.
 - .4 Process Orientation: Horizontal, unless otherwise noted.
- .4 Transmitter:
 - .1 Features: Minimum 2-line by 16-character LCD, keypad programmable.
 - .2 Signal Interface:
 - .1 Outputs: 4 to 20 mA with HART for maximum 600 ohm load, unless otherwise noted.
 - .2 Communication Protocols: Capable of both PROFIBUS DP and PROFIBUS PA.
 - .3 Provide communication protocol as shown on design documents.
 - .3 Power:
 - .1 Selectable: 115VAC, 230VAC, 24 VDC.
 - .2 Electrical Connection: 2 x 3/4-inch NPT.
 - .4 Transmitter Enclosure: Type: Aluminum NEMA 4X, unless otherwise noted.
 - .5 Mounting: Remote or integral to sensor.
 - .6 Cables: Supply cable as required between sensor and transmitter.
 - .7 Manufacturer and model:
 - .1 Endress and Hauser 65I.
 - .2 Or approved equal in accordance with B7.

2.10 Level Element and Transmitter, Ultrasonic

- .1 No alternates or substitutes will be accepted.
- .2 All requests for purchase or quotation shall reference RFP 449-2014 to receive standardized pricing that the City has negotiated with the vendor.

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.3 Manufacturer and Models:

- .1 Siemens Milltronics Multiranger 100 with XPS 15 sensor.
- .2 Siemens Sitrans Probe LU.
- .3 These products were standardized by the City via RFP 449-2014.

2.11 Level Transmitter, Submersible Hydrostatic

.1 General:

- .1 Approvals: CSA or cUL.
- .2 Function: Directly measure, indicate, and transmit level of process fluid.
- .3 Type: Hydrostatic level measurement.

.2 Service: Wastewater, unless otherwise noted.

.3 Performance:

- .1 Range: As noted.
- .2 Temperature: -10 to +70°C.

.4 Features:

- .1 Ambient Temperature Range (sensor): -10 to +70°C(for 42 mm diameter).
- .2 Transmitter Material and Size: stainless steel housing, external diameter of 42 mm.

.5 Accessories: Terminal box IP66/IP67 with GORE-TEX filter.

.6 Signal Interface:

- .1 Output: Analog 4 to 20 mA.
- .2 Communication: HART 6.0 Protocol.

.7 Manufacturer and model:

- .1 Endress and Hauser, Waterpilot FMX21.
- .2 Or approved equal in accordance with B7.

2.12 Level Switch, Float

.1 General:

- .1 Approvals: CSA or cUL.
- .2 Function: Actuate contact at preset liquid level.
- .3 Type: Direct-acting float with an enclosed switch and integral cable.

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- .2 Service: Wastewater, unless otherwise noted.
- .3 Performance:
 - .1 Set Point: As noted.
 - .2 Temperature: 0 to 50°C.
- .4 Features:
 - .1 Entire Assembly: Watertight and impact-resistant.
 - .2 Float Material and Size: Polyethylene/foam filled; 114 mm diameter max.
- .5 Signal Interface: Switch Contacts: Form C Dry Contact rated 4.5 A continuous at 120 VAC.
- .6 Manufacturer and model:
 - .1 Flygt ENM-10.
 - .2 Or approved equal in accordance with B7.

2.13 Level Controller – Sump Pit

- .1 General:
 - .1 Approvals: CSA or cUL.
 - .2 Ratings: NEMA 4.
 - .3 Function: Mechanical Alternator – Contacts alternate closing when operating within first switch set points, when higher set point is reached, both contacts close.
 - .4 Temperature: -30 to 121°C.
- .2 Service: Liquid; water, wastewater, unless otherwise noted.
- .3 Switch Contacts:
 - .1 Isolated, rated 10A continuous at 120 VAC.
 - .2 Close on liquid rise.
- .4 Float:
 - .1 Center Hole.
 - .2 Material: Stainless Steel.
- .5 Manufacturer and Model:
 - .1 Square D 9038AW1.
 - .2 Or approved equal in accordance with B7.

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2.14 Limit Switch – Clarifier Rake Sensor

- .1 General:
 - .1 Approvals: CSA or cUL.
 - .2 Ratings: Explosion Proof.
 - .3 Function: Normally open and normally closed contacts that switch when the lever arm is actuated by the rotating clarifier scum trough rake.
 - .4 Temperature: -40 to 40°C.
- .2 Service:
 - .1 Rated for wastewater application.
- .3 Wiring:
 - .1 Wiring cable, fittings, and installation to be rated for explosion proof area.
- .4 Manufacturer and Model:
 - .1 Rockwell Automation 802XR with 802MC-W3C lever arm.
 - .2 Or approved equal in accordance with B7.

2.15 Pressure Differential Switch

- .1 General:
 - .1 Approvals: CSA or cUL.
 - .2 Function: Monitor differential pressure, and provide contact closure(s) when differential pressure is at the noted set point.
 - .3 Type: Diaphragm actuated.
- .2 Performance:
 - .1 Set Point: Adjustable over the full range.
 - .2 Range: The noted set point shall fall between 20 and 80% of the range.
 - .3 Set Point Repeatability: Plus or minus 1.0% of range span.
 - .4 Maximum Pressure: Minimum 400% over range.
- .3 Features:
 - .1 Actuator Seal: Buna-N, unless otherwise noted.
 - .2 Pressure Connection: Nickel-plated brass, unless otherwise noted.
- .4 Process Connection: 6.35 mm NPT female connection, unless otherwise noted.

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- .5 Enclosure: NEMA 4X, unless otherwise noted.
- .6 Signal Interface:
 - .1 Contact Type: SPDT, rated for 10 amps at 120 VAC.
 - .2 Hermetically sealed switch, if noted.
- .7 Manufacturers:
 - .1 Ashcroft.
 - .2 United Electric.
 - .3 Or approved equal in accordance with B7.

2.16 Pressure Gauge

- .1 General:
 - .1 Function: Pressure indication.
 - .2 Type: Bourdon tube.
- .2 Performance:
 - .1 Scale Range: As noted.
 - .2 Accuracy: Plus or minus 0.50% of full scale.
- .3 Features:
 - .1 Vibration Dampening: Required – Liquid filled or otherwise.
 - .2 Dial: 114 mm diameter, unless otherwise noted.
 - .3 Case Material: Black phenolic plastic, unless otherwise noted.
 - .4 Element Material: Phosphor-bronze, unless otherwise noted.
 - .5 Throttling Devices:
 - .1 Pulsation Dampener required, unless otherwise noted.
 - .2 Brass, unless otherwise noted.
 - .6 Pointer: Micrometer-adjustable.
 - .7 Movement: Stainless steel, teflon coated bearings, rotary geared.
 - .8 Window: Glass, unless otherwise noted.
 - .9 Socket Materials: brass, unless otherwise noted.
 - .10 Threaded reinforced polypropylene front ring for easy zero adjustment.

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.11 Case Type: Solid front with solid wall between window and element. Rear of case, gasketed pressure relief.

.4 Process Connection:

.1 Mounting: Lower stem, unless otherwise noted.

.2 Size: 13 mm, unless otherwise noted.

.3 Connection Type: Threaded (NPT).

.5 Manufacturers and Products:

.1 Ashcroft.

.2 or approved equal in accordance with B7.

2.17 Pressure Switch

.1 General:

.1 Approvals: CSA or cUL.

.2 Function: Monitor pressure and provide contact closure(s) when pressure is at the noted set point.

.3 Type: Diaphragm sealed piston actuator.

.2 Performance:

.1 Set Point: Adjustable over the full range.

.2 Range: The noted set point shall fall between 30% and 70% of the range.

.3 Set Point Repeatability: Plus or minus 1% of range.

.3 Features:

.1 Diaphragm Material: Buna-N, unless otherwise noted.

.2 Pressure Connection: Stainless steel, unless otherwise noted.

.3 Reset: Automatic, unless otherwise noted.

.4 Enclosure: NEMA 4X, unless otherwise noted.

.5 Signal Interface: SPDT, snap action switch, rated for 15 amps at 120 VAC.

.6 Manufacturer and Model:

.1 Ashcroft B-Series,

.2 Or approved equal in accordance with B7.

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2.18 Pressure Transmitter

- .1 No alternates or substitutes will be accepted.
- .2 All requests for purchase or quotation shall reference RFP 449-2014 to receive standardized pricing that the City has negotiated with the vendor.
- .3 Provide factory installed block and bleed manifold, unless otherwise shown.
- .4 Manufacturer and Model:
 - .1 Siemens Sitrans P 320.
 - .2 This product was standardized by the City via RFP 449-2014.

2.19 Pressure Transmitter – HVAC

- .1 General:
 - .1 The measurement of room to atmospheric pressure.
 - .2 Local indication.
- .2 Material:
 - .1 316 Stainless Steel
- .3 Signal Interface:
 - .1 4-20 mA signal.
- .4 Accuracy
 - .1 0.2% of span.
- .5 Manufacturer and Model:
 - .1 Honeywell STD 700 Basic.
 - .2 Or approved equal in accordance with B7.

2.20 Density Meter

- .1 General:
 - .1 Solids analyzers shall measure the concentration of the solids pumped through the process pipeline.
 - .2 316 stainless steel flangeless wafer-style flow-through in-line transmitter.
- .2 Performance:
 - .1 Measuring range: 0-50% total solids.
 - .2 Repeatability: +/- 0.01% TS.

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- .3 Sensitivity: of +/-0.001%TS over the entire range.
- .3 Features:
 - .1 Touch screen display 7 Inch.
 - .2 Interconnection cable: 10 M.
 - .3 Measuring range: 0-50% total solids.
 - .4 Repeatability: +/- 0.01% TS.
 - .5 Sensitivity: of +/-0.001%TS over the entire range.
- .4 Enclosure:
 - .1 Sensor housing: NEMA 4X.
 - .5 Power supply: 120 VAC.
 - .6 Signal Interface:
 - .1 Input: 4 digital programmable relay.
 - .2 Output: 2 4-20 mA.
 - .3 Communication: Profibus-PA.
- .7 Manufacturer and Model:
 - .1 Valmet TS 4G CSA.
 - .2 Or approved equal in accordance with B7.

2.21 Horn

- .1 General:
 - .1 Approvals: CSA or cUL.
 - .2 Function: Audible alarm.
- .2 Performance:
 - .1 Temperature, Operating: -40 to+65°C.
 - .2 Sound Output Level: 100 dB nominal at 3 m.
- .3 Features:
 - .1 Dimensions: 111 mm in height and width, and 63.5 mm in depth, for horn and enclosure.
 - .2 Diaphragm: Stainless steel.
 - .3 Projector: None, unless otherwise noted.

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- .4 Enclosure: Type: Corrosion resistant NEMA 4X.
- .5 Voltage: 120 VAC, 60 Hz, unless otherwise noted.
- .6 Current: less than 0.2 A.
- .7 Manufacturers:
 - .1 Federal Signal 350WB.
 - .2 Or approved equal in accordance with B7.

2.22 Warning Light, Strobe

- .1 General:
 - .1 Approvals: CSA or cUL.
 - .2 Function: Visual alarm.
 - .3 Type: Rotating reflector or flashing bulb.
 - .4 Provide means to synchronize flashes within corridors or rooms in the same field of view.
- .2 Performance:
 - .1 Temperature, Operating: -37 to 87°C.
 - .2 Flash Rate: Minimum 80 per minute.
 - .3 Light Intensity: 800,000 candela or greater.
- .3 Features:
 - .1 Dome Colour: Red, unless noted otherwise.
 - .2 Lamp Life: 60,000 hours minimum.
 - .3 Lamp: LED.
- .4 Enclosure:
 - .1 Type: Corrosion resistant NEMA 4X.
 - .2 Mounting: Wall bracket, unless otherwise noted.
 - .3 Indoor/outdoor use.
- .5 Voltage: 120 VAC, 60 Hz, unless otherwise noted.
- .6 Current: less than 0.2 A.
- .7 Manufacturer and model:
 - .1 Federal Signal SLM100.

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- .2 Or approved equal in accordance with B7.

2.23 Door Switch

- .1 General:
 - .1 Approvals: CSA or cUL.
 - .2 Function: Monitor intrusion of standard door.
 - .3 Type: Magnetic, indoor use.
 - .4 Parts: Magnet on door, switch on door frame.
- .2 Features:
 - .1 Type: Aluminum housing with 914 mm (36") armored cable, unless otherwise noted.
 - .2 Gap Distance/Type: 76 mm (3") Make.
- .3 Signal Interface.
 - .1 Voltage: 24 VDC.
 - .2 Contact Type: SPDT.
 - .3 Contact Rating: 0.25 A @ 24 VDC.
 - .4 Connection: 914 mm (36") lead wires.
- .4 Manufacturer and model:
 - .1 GE Security 2507A.
 - .2 Or approved equal in accordance with B7.

2.24 Motion Detector

- .1 General:
 - .1 Approvals: CSA or cUL.
 - .2 Function: Monitor occupancy.
 - .3 Type: Dual Technology Ultrasonic and Passive Infrared.
- .2 Features:
 - .1 Type: plastic Casing.
 - .2 Coverage: 150 square meter (1600 square feet).
 - .3 Mounting: Mounting base provided.
 - .4 Operating temperature: 0° to 40°C

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- .5 Relative humidity: 0% to 95%.
- .6 Power Requirements: Voltage: 24 VDC.
- .3 Signal Interface.
 - .1 Voltage: 24 VDC.
 - .2 Contact Type: SPDT.
 - .3 Contact Rating: 500 mA @ 24 VDC.
- .4 Manufacturer and model:
 - .1 Hubbell LODTRP.
 - .2 Or approved equal in accordance with B7.

2.25 Grinder Pump Level Control Switch

- .1 General:
 - .1 Provide an integral alternating pump control switch rated for wastewater applications.
 - .2 The pump controller will activate the output contacts based on the float position.
 - .3 Configure the start and stop height of the pump controller based on the sump pit high and low/empty levels.
- .2 Manufacturer and Model:
 - .1 Pedastal Mounted mechanical alternator Square D Pumptrol 9038AG1C complete with float kit Schneider Electric 9049A6.
 - .2 Or approved equivalent as per Section B7.

2.26 Card Access Reader

- .1 General:
 - .1 RFID Card Reader with 2.5"-4" range or better.
 - .2 -55C to 85C Operating temperature.
 - .3 Must be compatible with existing plant RFID card access system.
 - .4 Integrate new Card Readers with the existing Card access system. Work with the City to configure access.
 - .1 Electrical room shall only be accessible by the AICG and EI staff; all other rooms shall be accessible by all plant staff.
- .5 Test and demonstrate to the Contract Administrator cards of different access levels and incorrect card types.

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.2 Manufacturer and product line:

.1 HID multiCLASS SE RP40

3. EXECUTION

3.1 Installation

.1 Install equipment and 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 Electrical:

.1 Complete installation in accordance with Section 40 90 00 and 26 05 00.

.2 Install communication wiring in conduit or utilizing ACIC cabling if shown on the Drawings.

.1 Provide complete conduit/cable system to link instrumentation and the control panel(s).

.2 Conduit sizes to suit wiring requirements and to allow for future expansion capabilities specified for systems.

.3 Maximum conduit fill not to exceed 40%.

.4 Design Drawings do not show conduit layout.

3.2 Temperature Sensors

.1 Stabilize to ensure minimum field adjustments or calibrations.

.2 Readily accessible and adaptable to each type of application to allow for quick easy replacement and servicing without special tools or skills.

.3 Duct installations:

.1 Do not mount in dead air space.

.2 Locate within sensor vibration and velocity limits.

.3 Securely mount extended surface sensor used to sense average temperature.

.4 Thermally isolate elements from brackets and supports to respond to air temperature only.

.5 Support sensor element separately from coils or filter racks.

.4 Averaging duct type temperature sensors.

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- .1 Install averaging element horizontally across the ductwork starting 300 mm from top of ductwork. Each additional horizontal run to be no more than 300 mm from the one above it. Continue until complete cross sectional area of ductwork is covered. Use multiple sensors where single sensor does not meet required coverage.

3.3 Pressure Switches and Transmitters

- .1 Install in a manner to allow easy removal of the transducer and cable assembly for maintenance purposes.
- .2 Survey and document the exact elevation of the pressure transmitter installation.

3.4 Differential Pressure Transmitter

- .1 Install a valve and tee on each line coming into transmitter to allow tubing to be blown out.

3.5 Identification

- .1 Identify field devices with lamacoids. Install in a conspicuous location.

3.6 Testing and Commissioning

- .1 Calibrate and test field devices for accuracy and performance in accordance with Section 40 99 92 – Automation Testing and Commissioning.

3.7 TRAINING

- .1 Provide one (1) 4-hour training for instrument including but not limited to items listed in specification Section 40 91 01.

END OF SECTION