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Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat, SectionFormat,* and *PageFormat*

This section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all “Specifier Notes” after editing this section.

Section numbers are from *MasterFormat 2020 Update.*

SECTION 28 42 00

GAS DETECTION AND ALARM

Specifier Notes: Delete any information below in Parts 1, 2 or 3 which is not required or relevant for the project.

1. GENERAL
   1. SECTION INCLUDES
      1. Fixed Gas Detection.
         1. AMC-UTx-M-400 Transmitter.
         2. AMC-400 Transmitter.
         3. AMC-1DBX Digital Monitor.
      2. Modular Boxes.
         1. AMC-1DMB–RL 8CH Relay Module.
         2. AMC-1DPS 24VDC, 7A, Power Supply.
         3. AMC-1DMB–PS-R Power Supply w Repeater.
         4. AMC-1DMB-AI 8CH 0-20mA Analog Input.
         5. AMC-1DMB-RL-AO 8CH Relay and Analog Out Module.
      3. Remote Alarm Modules.
         1. AMC-RAM-3 Remote Audio/Visual Alarm.
   2. RELATED SECTIONS
      1. Division 16 - Electrical.
   3. REFERENCES
      1. CSA Group (CSA):
         1. CAN/CSA C22.2 No. 205-17 - Signal Equipment - Second Edition).
      2. Underwriters Laboratories (UL):
         1. ANSI / UL 1635: 2018 - Digital Alarm Communicator System Units - Fourth Edition.
      3. National Electrical Manufacturers Association (NEMA):
         1. NEMA 4X - Watertight and corrosion resistant enclosures constructed for indoor or outdoor use.
         2. NEMA 4 – Water resistant and corrosion resistant enclosures constructed for indoor or outdoor use.
         3. NEMA 1 – Protection from solid objects and access to hazardous parts, constructed for indoor use.
   4. SUBMITTALS
      1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
      2. Product Data:
         1. Manufacturer's data sheets on each product to be used.
         2. Preparation instructions and recommendations.
         3. Storage and handling requirements and recommendations.
         4. Typical installation methods.
      3. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
   5. QUALITY ASSURANCE
      1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
      2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
      3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
   6. PRE-INSTALLATION CONFERENCE
      1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
   7. DELIVERY, STORAGE, AND HANDLING
      1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
      2. Protect from damage due to weather, excessive temperature, and construction operations.
   8. PROJECT CONDITIONS
      1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
   9. WARRANTY
      1. Manufacturer's standard limited warranty unless indicated otherwise.
2. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Armstrong Monitoring, which is located at: 215 Colonnade Road South.; Ottawa, Ontario, Canada K2E 7K3; Toll Free Tel: 1-800-465-5777; Fax: (613) 225-6965; Email: [quotes@armstrongmonitoring.com](mailto:quotes@armstrongmonitoring.com)) Web: [https://armstrongmonitoring.com/](https://armstrongmonitoring.com/%20)
      2. Substitutions: Not permitted.
      3. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
   2. FIXED GAS DETECTION
      1. Basis of Design: Model AMC-UTx-M Transmitter as manufactured by Armstrong Monitoring.
         1. Highly configurable fixed gas detector for single or dual sensor applications.
         2. Recommended Mounting Height: 4-5 ft. (1.2 – 1.5m) A.F.F
         3. Coverage Area: up to 7500 sq. ft. (700 sq. m.); 50 ft (15m) radius
         4. Gas Options:
            1. Carbon Monoxide (CO).

AMC-UTx-M-91A01-N-R-0400 (CO) 0-100 PPM, EC.

AMC-UTx-M-91B01-N-R-0400 (CO) 0-300 PPM, EC.

* + - * 1. Carbon Monoxide (CO) and Nitrogen Dioxide (NO2).

AMC-UTx-M-VCA01-N-R-0400 (CO) 0-100 PPM, (NO2) 0-10 PPM, EC.

AMC-UTx-M-91B01-98A01-R-0400 (CO) 0-300 PPM, (NO2) 0-10 PPM, EC.

* + - * 1. Nitrogen Dioxide (NO2)

AMC-UTx-M-98A01-N-R-0400 (NO2) 0-10ppm

* + - 1. Expected Sensor Life: Up to 6 years (CO) or up to 3 years (NO2). End-of-life notification.
      2. Sensor Calibration: Recommended recalibration every6 months, or more frequently as required
         1. Patent pending ADAPTiCal™ algorithm ensures safe, reliable and rapid calibrations optimized for the unique operating conditions of each sensor.
         2. The integral sensor module(s) are easily changed, and are eligible for the EZ Cal™ service program, allowing sensor maintenance to be a simple swap-out
      3. Intelligent sensors transfer sensor information to transmitter including sensor type, measurement range, calibration span values, last calibration date, serial number, sensor life and manufacture date.
      4. Housing: Grey Polycarbonate Enclosure (LxWxH): 5.45 x 4.64 x 2.35 inch (138 x 118 x 60 mm)
      5. Power Supply: 12-24 VDC, 40mA.
      6. Temperature Range: -4 to +104 degrees F (-20 to 40 degrees C).
      7. Humidity Range: 15-90 percent RH Non-condensing.
      8. Atmospheric Pressure: 0.9 to 1.1 atm.
      9. Weight: 1.0 lbs. (0.45 kg) max.
      10. Display: OLED Display (8 lines x 20 characters).
          1. Displays gas values, units of measurement, system configuration options and alarm levels.
          2. Three button user interfaces to view or change system configuration parameters
      11. Front Panel Indicators: 3 LEDs
          1. Sensor; indicates status of the Sensor Module or highest error level if multiple errors are reported.
          2. Network; indicates status of Modbus interface.
          3. Sensor Module; indicates status of sensor element or module.
      12. Relay
          1. SPDT, 2A @ 30VDC, resistive.
      13. Serial Interface
          1. RS-485 RTU addressable interface MODBUS RTU over RS-485 9600 Baud, 8bit Even Parity
      14. Connecting Terminals
          1. Wire Range, Signal: 22 AWG to 20 AWG (0.33-0.5 sq.mm.); The cable characteristics required are an impedance of 120 ohms and a low capacitance: ≈ 13pf/ft conductor to conductor and ≈ 23pf/ft conductor to shield.
          2. Wire Range, Power: 18 AWG to 16 AWG (0.82-1.3 sq.mm.);
          3. Strip Length: 0.35 in. (9 mm)
      15. Accessories
          1. AMC-WS00-SL Weathershield
          2. AMC-VG-XL Vandal Guard Universal fit
          3. 3473501-6 Pole Mounting Bracket (included with each transmitter)
          4. AMC-C1-FM1 Calibration Kit
          5. AMC-FM1 Calibration Adaptor (included with Calibration Kit or can be ordered separately)
    1. Basis of Design: Model AMC-400 Transmitter as manufactured by Armstrong Monitoring.
       1. Fixed gas detector for single or dual sensor applications.
       2. Recommended Mounting Height: 4-5 ft. (1.2 – 1.5m) A.F.F
       3. Coverage Area: up to 7500 sq. ft. (700 sq. m.); 50 ft (15m) radius
       4. Gas Options:
          1. Carbon Monoxide (CO).

AMC-400-CO (CO) 0-100 PPM, EC.

AMC-400-CO-HC (CO) 0-200 PPM, EC.

* + - * 1. Nitrogen Dioxide (NO2)

AMC-400-NO2 (NO2) 0-10ppm

* + - * 1. Hydrogen (H2)

AMC-400-H2 (H2) 0-100% LEL

* + - * 1. Methane (CH4)

AMC-400-CH4 (CH4) 0-100% LEL

* + - * 1. Propane (C3H8)

AMC-400-C3H8 (C3H8) 0-100% LEL

* + - 1. Expected Sensor Life: Up to 6 years (CO) or up to 3 years (NO2).
      2. Sensor Calibration: Recommended recalibration every 6 months.
      3. Housing: Grey Polycarbonate Enclosure (LxWxH): 5.45 x 4.64 x 2.35 inch (138 x 118 x 60 mm)
      4. Power Supply: 12-24 VDC, 40mA.
      5. Temperature Range: -4 to 104 degrees F (-20 to 40 degrees C).
      6. Humidity Range: 15-90 percent RH Non-condensing.
      7. Atmospheric Pressure: 0.9 to 1.1 atm.
      8. Weight: 0.8 lbs. (0.36 kg) max.
      9. Display: LCD Display (3 characters).
         1. Displays gas concentration and status information
         2. Momentary On/Off Pushbutton User Interface for Configuration
      10. Front Panel Indicators: 3 LEDs
          1. Transmitter Status; indicates status of the transmitter.
          2. Sensor; indicates status of sensor.
      11. Serial Interface
          1. RS-485 RTU addressable interface MODBUS RTU over RS-485 9600 Baud, 8bit Even Parity
      12. Connecting Terminals
          1. Wire Range, Signal: 22 AWG to 20 AWG (0.33-0.5 sq.mm.); The cable characteristics required are an impedance of 120 ohms and a low capacitance: ≈ 13pf/ft conductor to conductor and ≈ 23pf/ft conductor to shield.
          2. Wire Range, Power: 18 AWG to 16 AWG (0.82-1.3 sq.mm.);
          3. Strip Length: 0.35 in. (9 mm)
      13. Accessories
          1. AMC-WS00-SL Weathershield
          2. AMC-VG-XL Vandal Guard Universal fit
          3. 3473501-6 Pole Mounting Bracket (included with each transmitter)
          4. AMC-C1-FK1 CO Cal Kit (use for all non-reactive gases)
          5. AMC-C1-FK2 NO2 Cal Kit (use for reactive gases)
    1. Basis of Design: Model AMC-1DBX Digital Monitor as manufactured by Armstrong Monitoring.
       1. The AMC-1DBx Digital Monitor provides a versatile monitoring package systems using Armstrong’s addressable AMC-UTx-M-400 and AMC-400 Series transmitters. Supports up to 988 sensors divided over up to 128 zones.
       2. Certifications
          1. CSA Listed for Canada and USA.
       3. Housing: 16-gauge steel (LxWxH): 12 x 12.25 x 6.875 inch (305 x 311 x 175 mm).
          1. Grey powder coating
          2. Degree of Protection: NEMA 1.
          3. Latchable with hinged door.
          4. Knockouts: 3x 1.375/1.125-inch diameter and 3x 1.125/0.875-inch diameter on bottom surface
          5. Mounting flanges extend 0.8 inches top and bottom
       4. Power Supply, Input:
          1. AC Option: 120 VAC, 60 Hz, 100 VA.
          2. DC Option: 24VDC, 2A.
       5. Power Output:
          1. DC: 24VDC, 1A max to provide power for external devices on RS-485 network.
       6. Options:
          1. AMC-1DB1-30000B Gas Monitor, Nema 1, 120VAC 4 Integral DPDT Relays
          2. AMC-1DB1-30000D Gas Monitor, Nema 1, 120VAC 8 Integral DPDT Relays
          3. AMC-1DB1-30000F Gas Monitor, Nema 1, 120VAC 12 Integral DPDT Relays
          4. AMC-1DB1-30000H Gas Monitor, Nema 1, 120VAC 16 Integral DPDT Relays
          5. AMC-1DB1-40000B Gas Monitor, Nema 1, 24VDC 4 Integral DPDT Relays
          6. AMC-1DB1-40000D Gas Monitor, Nema 1, 24VDC 8 Integral DPDT Relays
          7. AMC-1DB1-40000F Gas Monitor, Nema 1, 24VDC 12 Integral DPDT Relays
          8. AMC-1DB1-40000H Gas Monitor, Nema 1, 24VDC 16 Integral DPDT Relays
       7. Display: 3.5 inch (89mm), 320x240 pixel.
          1. Displays gas values, units of measurement, system configuration options and alarm levels.
       8. User Interface. Eight pushbuttons:
          1. UP, DOWN and BACK pushbuttons to navigate menu on display.
          2. ENTER pushbutton to select options on menu.
          3. RESET RELAY will reset latching relays if the associated alarm condition has passed.
          4. TEST pushbutton to activate relays and audio alarm for test purposes.
          5. SILENCE. Allows silencing of audible alarms and can be configured to allow resetting of relay outputs.
          6. HOLD. When activated will freeze the display content on the currently displayed sensor reading.
       9. Front Panel Indicators: Nine LEDs
          1. SYSTEM LED indicates power supply status
          2. FAULT LED to indicate system health
          3. ALARM LEDs. Three LEDs to indicate if gas concentrations exceed alarm thresholds.
          4. MODBUS LEDs to indicate MODBUS traffic; sending and receiving.
          5. ETHERNET LEDs to indicate Link Activity and Speed.
       10. Alarm: 95 dBa at (100 mm), 2.9 kHz piezoelectric element.
       11. Temperature Range: Minus 4 to 122 degrees F (Minus 20 to 50 degrees C).
       12. Humidity Range: 0-90 percent RH Non-condensing.
       13. Atmospheric Pressure: 0.9 to 1.1 atm.
       14. Connecting Terminals
           1. Wire Range, Power and Signal: 26 AWG to 14 AWG (0.13-2.08 sq.mm.);
           2. Wire Range, Chassis Ground: 14 AWG to 2 AWG (2.08-33.6 sq.mm.
           3. Strip Length: 0.3 in. (7 mm)
           4. Torque: 2.6 lb.-in. (0.3 Nm)
       15. Weight: 15.8 lbs. (7.2 kg) max.
       16. Serial Interface
           1. Four RS-485 lanes providing MODBUS interface for transmitters.
           2. RS-485 9600 Baud, 8bit Even Parity interface to provide optional BACnet/MSTP uplink to BAS.
           3. Ethernet Interface. 10/100 UTP providing optional BACnet/IP uplink to BAS.
           4. USB 2.0 Interface for external flash drives used in firmware upgrades or downloading the units database.
       17. Analog Outputs:
           1. Four user selectable 0-20mA or 0-10V outputs
           2. Additional outputs available using external Modular Boxes connected to the RS485 lanes.
       18. Analog Inputs
           1. 0-20mA inputs available using external Modular Boxes connected to the RS485 lanes.
       19. Relays:
           1. DPDT 10 A @ 250 VAC Res.
           2. Up to 16 relays per Control Panel.
           3. Up to 255 relays with use of external Modular Boxes.
  1. MODULAR BOXES
     1. Basis of Design: Model AMC-1DMB–RL 8CH Relay Module as manufactured by Armstrong Monitoring.
        1. Each AMC-1DMB-RL provides an additional eight DPDT relay interfaces that are controlled over the AMC-1DBX Control Panel Modbus interface.
        2. Certifications:
           1. CSA Listed for Canada and USA.
        3. Housing: 16-gauge steel (LxWxH): 12 x 12.25 x 6.875 inch (305 x 311 x 175 mm).
           1. Grey powder coating
           2. Degree of Protection: NEMA 1.
           3. Latchable with hinged door.
           4. Knockouts: 3x 1.375/1.125-inch diameter and 3x 1.125/0.875-inch diameter on bottom surface
           5. Mounting flanges extend 0.8 inches top and bottom
        4. Power Supply:
           1. DC: 24VDC Input, +/- 10%, 450mA (with all relays energized)
        5. Serial Interface
           1. RS-485 RTU addressable interface MODBUS RTU over RS-485 9600 Baud, 8bit Even Parity
        6. Temperature Range:
           1. 1450 to 122 degrees F (Minus 10 to 50 degrees C).
        7. Humidity Range:
           1. 0-95 percent RH Non-condensing.
        8. Atmospheric Pressure: 0.9 to 1.1 atm.
        9. Connecting Terminals
           1. Wire Range, Power and Signal: 22 AWG to 12 AWG (0.2-2.5 sq.mm.);
           2. Wire Range, Ground: 22 AWG to 10 AWG (0.2-4 sq.mm.
           3. Strip Length: 0.3 in. (8 mm)
           4. Torque: 7 lb.-in. (0.4 Nm)
        10. Weight: 11.6 lbs. (5.26 kg) max.
     2. Basis of Design: Model AMC-1DPS-7A Power Supply as manufactured by Armstrong Monitoring.
        1. Each AMC-1DPS-7A provides up to an additional 7 amps of 24VDC power to provide power to devices within the network.
        2. Certifications:
           1. CSA Listed for Canada and USA.
        3. Housing: 16-gauge steel (LxWxH): 12 x 12.25 x 6.875 inch (305 x 311 x 175 mm).
           1. Grey powder coating
           2. Degree of Protection: NEMA 1.
           3. Latchable with hinged door.
           4. Knockouts: 3x 1.375/1.125-inch diameter and 3x 1.125/0.875-inch diameter on bottom surface
           5. Mounting flanges extend 0.8 inches top and bottom
        4. Power Supply:
           1. Input: 120VAC, 60 Hz, 5.3A
           2. Output: DC: 24VDC, 10A
        5. Fuses:
           1. 5x20mm 4A Input
           2. 5x20mm 10A Output
        6. Temperature Range:
           1. 32 to 122 degrees F (0 to 50 degrees C).
        7. Humidity Range:
           1. 0-90 percent RH Non-condensing.
        8. Atmospheric Pressure: 0.9 to 1.1 atm.
        9. Connecting Terminals
           1. Wire Range, Power and Signal: 22 AWG to 12 AWG (0.2-2.5 sq.mm.);
           2. Wire Range, Ground: 22 AWG to 10 AWG (0.2-4 sq.mm.
           3. Strip Length: 0.3 in. (8 mm)
           4. Torque: 7 lb-in. (0.4 Nm)
        10. Weight: 11.6 lbs. (5.26 kg) max.
     3. Basis of Design: Model AMC-1DMB–PS-R Modular Box as manufactured by Armstrong Monitoring.
        1. An AMC-1DMB-PS-R can be used to expand RS-485 networks, while also offering up to 7A of 24VDC power for nodes on the RS-485 network. It was designed to isolate the data coming from the AMC-1DBX Control Panel RS-485 input and transmit to a four loop, expanded, RS-485 network.
        2. Certifications:
           1. CSA Listed for Canada and USA.
        3. Housing: 16-gauge steel (LxWxH): 12 x 12.25 x 6.875 inch (305 x 311 x 175 mm).
           1. Grey powder coating
           2. Degree of Protection: NEMA 1.
           3. Latchable with hinged door.
           4. Knockouts: 3x 1.375/1.125-inch diameter and 3x 1.125/0.875-inch diameter on bottom surface
           5. Mounting flanges extend 0.8 inches top and bottom
        4. Power Supply:
           1. Input 120VAC, 60 Hz, 5.3A
           2. Output 24VDC, 10A
        5. Fuses:
           1. 5x20mm 4A Input
           2. 5x20mm 10A Output
        6. Serial Interface
           1. Input: RS-485 RTU addressable interface MODBUS RTU over RS-485 9600 Baud, 8bit Even Parity
           2. Output: Electrically isolated four loop RS-485 network.
        7. Temperature Range:
           1. 32 to 122 degrees F (0 to 50 degrees C).
        8. Humidity Range:
           1. 0-90 percent RH Non-condensing.
        9. Atmospheric Pressure: 0.9 to 1.1 atm.
        10. Connecting Terminals
            1. Wire Range, Power and Signal: 22 AWG to 12 AWG (0.2-2.5 sq.mm.);
            2. Wire Range, Ground: 22 AWG to 10 AWG (0.2-4 sq.mm.
            3. Strip Length: 0.3 in. (8 mm)
            4. Torque: 7 lb.-in. (0.4 Nm)
        11. Weight: 11.6 lbs. (5.26 kg) max.
     4. Basis of Design: Model AMC-1DMB-AI Modular Box as manufactured by Armstrong Monitoring.
        1. Each AMC-1DMB-AI provides eight channels of 0-20mA Analog Inputs that can be communicated to the AMC-1DBX Control Panel over the RS-485 Modbus Interface.
        2. Certifications:
           1. CSA Listed for Canada and USA.
        3. Housing: 16-gauge steel (LxWxH): 12 x 12.25 x 6.875 inch (305 x 311 x 175 mm).
           1. Grey powder coating
           2. Degree of Protection: NEMA 1.
           3. Latchable with hinged door.
           4. Knockouts: 3x 1.375/1.125-inch diameter and 3x 1.125/0.875-inch diameter on bottom surface
           5. Mounting flanges extend 0.8 inches top and bottom
        4. Power Supply:
           1. DC: 12-24VDC Input, 250mA
        5. Serial Interface
           1. RS-485 RTU addressable interface MODBUS RTU over RS-485 9600 Baud, 8bit Even Parity.
        6. Analog Inputs (AMC-1DMB-AI only):
           1. Eight channels 0 to 20 mA.
        7. Temperature Range:
           1. 14 to 122 degrees F (Minus 10 to 50 degrees C).
        8. Humidity Range:
           1. 0-90 percent RH Non-condensing.
        9. Atmospheric Pressure: 0.9 to 1.1 atm.
        10. Connecting Terminals
            1. Wire Range, Power and Signal: 22 AWG to 12 AWG (0.2-2.5 sq.mm.);
            2. Wire Range, Ground: 22 AWG to 10 AWG (0.2-4 sq.mm.
            3. Strip Length: 0.3 in. (8 mm)
            4. Torque: 7 lb.-in. (0.4 Nm)
        11. Weight: 11.6 lbs. (5.26 kg) max.
     5. Basis of Design: Model AMC-1DMB-RL-AO Modular Box as manufactured by Armstrong Monitoring.
        1. Each AMC-1DMB-RL-AO provides eight DPDT relay interfaces and eight channels of 0-20mA Analog Outputs controlled by the AMC-1DBX Control Panel over the Modbus Interface.
        2. Certifications:
           1. CSA Listed for Canada and USA.
        3. Housing: 16-gauge steel (LxWxH): 12 x 12.25 x 6.875 inch (305 x 311 x 175 mm).
           1. Grey powder coating
           2. Degree of Protection: NEMA 1.
           3. Latchable with hinged door.
           4. Knockouts: 3x 1.375/1.125-inch diameter and 3x 1.125/0.875-inch diameter on bottom surface
           5. Mounting flanges extend 0.8 inches top and bottom
        4. Power Supply:
           1. DC: 24VDC Input, +/- 10%, 700mA (with all relays energized)
        5. Serial Interface
           1. RS-485 RTU addressable interface MODBUS RTU over RS-485 9600 Baud, 8bit Even Parity
        6. Analog Outputs (AMC-1DBM-RL-AO only):
           1. Eight channels of 0 to 20 mA
        7. Relays:
           1. Eight DPDT 10A @ 240 VAC Res
        8. Temperature Range:
           1. 14 to 122 degrees F (Minus 10 to 50 degrees C).
        9. Humidity Range:
           1. 0-90 percent RH Non-condensing.
        10. Atmospheric Pressure: 0.9 to 1.1 atm.
        11. Connecting Terminals
            1. Wire Range, Power and Signal: 22 AWG to 12 AWG (0.2-2.5 sq.mm.);
            2. Wire Range, Ground: 22 AWG to 10 AWG (0.2-4 sq.mm.
            3. Strip Length: 0.3 in. (8 mm)
            4. Torque: 7 lb.-in. (0.4 Nm)
        12. Weight: 11.6 lbs. (5.26 kg) max.
  2. REMOTE ALARM MODULES
     1. Basis of Design: Model AMC-RAM-3 Remote Alarm Monitor as manufactured by Armstrong Monitoring.
        1. Designed to offer remote audio/visual signaling of alarms, in conjunction with any of Armstrong Monitoring's monitor systems, the AMC-RAM-3 is perfect for mechanical rooms, confined spaces, or general remote alarming requirements.
        2. Recommended Mounting Height: 4-5 ft. (1.2 – 1.5m) A.F.F
        3. Housing: Polypropylene (LxWxH): 11.75 x 9.98 x 5.46 inch (299 x 253 x 139 mm).
           1. Degree of Protection: NEMA 4X
        4. Power Supply: 12-24 VDC, 275mA with strobe and buzzer operating.
        5. Indicators:
           1. Red Strobe Light, 90 strobes/minute
           2. Buzzer 85 dBa at (610 mm), 2.9 kHz piezoelectric element.
        6. Audio Alarm Acknowledge switch silences alarm, but visual alarm continues until gas clears
        7. Temperature Range:
           1. Operating: Minus 40 to 140 degrees F (Minus 40 to 50 degrees C).
           2. Storage: Minus 40 to 167 degrees F (Minus 40 to 70 degrees C).
        8. Humidity Range: 0-99 percent RH Non-condensing.
        9. Atmospheric Pressure: 0.9 to 1.1 atm.
        10. Connecting Terminals, Power
            1. Wire Range: 22 AWG to 16 AWG (0.2-1.5 sq.mm.); Shielding required?
            2. Ring Terminal for #6 stud.
            3. Torque: 7 lb-in. (0.4 Nm)
        11. Connecting Terminal, Ground:
            1. Wire Range, Ground: 14 AWG to 2 AWG (2.08-33.6 sq.mm.)
            2. Strip Length: 0.47 in. (11.9 mm)
            3. Torque: 12 lb.-in. (1.3 Nm)
        12. Weight: 3.3 lbs. (1.7 kg).

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly constructed and prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
   4. FIELD QUALITY CONTROL
      1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.
      2. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
   5. CLEANING AND PROTECTION
      1. Clean products in accordance with the manufacturer’s recommendations.
      2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION