

Net Safety™ Millennium

Air Particle Monitor (APM) Oil Mist Detector



Important instructions

Because these products are sophisticated technical instruments, it is important that the owner and operation personnel must strictly adhere both to the information printed on the product nameplate and to all instructions provided in this manual prior to installation, operation, and maintenance.

⚠ WARNING

Follow instructions

Installing, operating, or maintaining this product improperly could lead to serious injury or death from explosion or exposure to dangerous substances.

Comply with all information on the product, in this manual, and in any local or national codes that apply to the product.

Do not allow untrained personnel to work with this product.

The information in this document has been carefully checked and is believed to be entirely reliable with all the necessary information included.

All individuals who have or will have responsibility for using, maintaining, or servicing the product must read this manual carefully.

⚠ CAUTION

Equipment repairs

The detector is not field repairable due to the meticulous alignment and calibration of the sensors and the respective circuits. Do not repair the detector in the field.

⚠ WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

Warranty

1. **Limited Warranty**. Subject to the limitations contained in Section 2 (Limitation of Remedy and Liability) herein, Seller warrants that (a) the licensed firmware embodied in the Goods will execute the programming instructions provided by Seller; (b) that the Goods manufactured by Seller will be free from defects in materials or workmanship under normal use and care; and (c) Services will be performed by trained personnel using proper equipment and instrumentation for the particular Service provided. The foregoing warranties will apply until the expiration of the applicable warranty period. Sensors and detectors are warranted against defective parts and workmanship for 24 months from the date of purchase and other electronic assemblies for 36 months from the date of purchase. Products purchased by Seller from a third party for resale to Buyer (**Resale Products**) shall carry only the warranty extended by the original manufacturer. Buyer agrees that Seller has no liability for Resale Products beyond making a reasonable commercial effort to arrange for procurement and shipping of the Resale Products. If Buyer discovers any warranty defects and notifies Seller thereof in writing during the applicable warranty period, Seller shall, at its option, (i) correct any errors that are found by Seller in the firmware or Services; (ii) repair or replace FOB point of manufacture that portion of the Goods found by Seller to be defective; or (iii) refund the purchase price of the defective portion of the Goods/Services. All replacements or repairs necessitated by inadequate maintenance; normal wear and usage; unsuitable power sources or environmental conditions; accident; misuse; improper installation; modification; repair; use of unauthorized replacement parts; storage or handling; or any other cause not the fault of Seller are not covered by this limited warranty and shall be replaced or repaired at Buyer's sole expense, and Seller shall not be obligated to pay any costs or charges incurred by Buyer or any other party except as may be agreed upon in writing in advance by Seller. All costs of dismantling, reinstallation, freight, and the time and expenses of Seller's personnel and representatives for site travel and diagnosis under this limited warranty clause shall be borne by Buyer unless accepted in writing by Seller. Goods repaired and parts replaced by Seller during the warranty period shall be in warranty for the remainder of the original warranty period or 90 days, whichever is longer. This limited warranty is the only warranty made by Seller and can be amended only in a writing signed by an authorized representative of Seller. The limited warranty herein ceases to be effective if Buyer fails to operate and use the Goods sold hereunder in a safe and reasonable manner and in accordance with any written instructions from the manufacturers. **THE WARRANTIES AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE. THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO ANY OF THE GOODS OR SERVICES.**
2. **Limitation of Remedy and Liability** SELLER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE. THE REMEDIES OF BUYER SET FORTH IN THE AGREEMENT ARE EXCLUSIVE. IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT, OR OTHERWISE), SHALL SELLER'S LIABILITY TO BUYER AND/OR BUYER'S CUSTOMERS EXCEED THE PRICE TO BUYER OF THE SPECIFIC GOODS MANUFACTURED OR SERVICES PROVIDED BY SELLER GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL SELLER'S LIABILITY TO BUYER AND/OR BUYER'S CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES. THE TERM "CONSEQUENTIAL DAMAGES" SHALL INCLUDE, BUT NOT BE LIMITED TO, LOSS OF ANTICIPATED PROFITS, REVENUE OR USE AND COSTS INCURRED, INCLUDING WITHOUT LIMITATION FOR CAPITAL, FUEL AND POWER, AND CLAIMS OF BUYER'S CUSTOMERS.

1 Introduction

1.1 Models covered

The Net Safety™ Air Particle Monitor (APM) is an infrared optical detector used in hazardous industrial applications to monitor ambient air for the presence of particulate matter from products of combustion, such as carbon, air particulate matter, or ash.

The Net Safety Millennium Transmitter is an environmentally protected electronic package contained within an explosion-proof housing. With its scrolling eight-character display and status LEDs, it provides instructions and status alerts.

The Net Safety APM Sensor is mounted where airborne particles are anticipated to accumulate, while the Net Safety Millennium Transmitter is located conveniently at eye level.

The product is available in stainless steel (SS).

Models available are:

- MLP-AR-APM-OP-SS: APM, 4-20 mA analog output with alarm and fault relays, stainless steel housing, CSA approved
- MLP-AR-APM-OP-SS-X: APM, 4-20 mA analog output with alarm and fault relays, stainless steel housing, CSA, ATEX, and IECEx approved

1.2 Service support

You can get technical support for this product by contacting your local Emerson/Net Safety representative or by contacting the Net Safety Technical Support department at: Toll Free +1 866 347 3427 or Safety.CSC@emerson.com.

1.3 Return of material

To expedite the repair and return of this product, proper communication between the customer and the factory is important.

Prerequisites

Before returning a product for repair, call +1 866 347 3427 (toll free) or email Safety.CSC@emerson.com for a Return Material Authorization (RMA) number.

On the return of the equipment, include the following information:

1. RMA number provided to you by Net Safety.
2. Company name and contact information.
3. Purchase order, from your company, authorizing repairs or request for quote.

Procedure

1. Ship all equipment, prepaid to:

Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN 55379

2. Mark all packages with *Return for Repair* and include RMA number and type of return (e.g., return for evaluation).

Pack items to protect them from damage and use anti-static bags or aluminum-backed cardboard as protection from electrostatic damage.

Important

Ship all equipment prepaid. Emerson will not accept collect shipments.

1.4

Product recycling/disposal

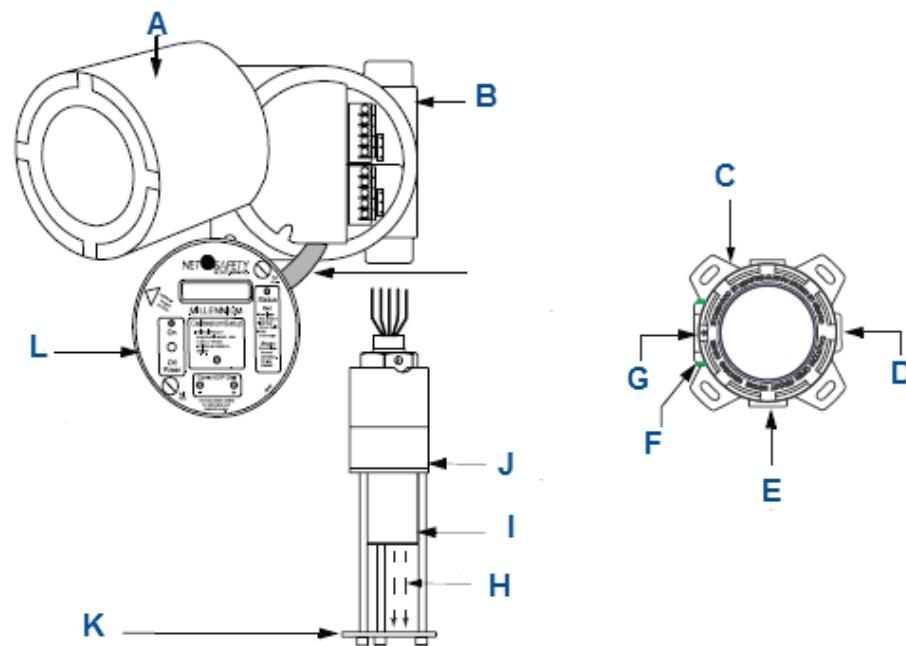
Consider recycling equipment and packaging and dispose of them in accordance with local and national legislations/regulations.

2 Install

2.1 Unpack and inspect

Carefully remove all of the components from the packaging and verify them against the enclosed packing list. Inspect all components for any obvious damage such as broken or loose parts. If you find any components missing or damaged, notify your local Emerson representative or the factory immediately. [Figure 2-1](#) outlines the components supplied with the Net Safety™ APM.

Figure 2-1: Net Safety APM Components



- A. Housing cover
- B. Net Safety Millennium housing
- C. Junction box
- D. 3/4-in. national pipe thread (NPT)
- E. 3/4-in. NPT
- F. Earth ground screw
- G. 3/4-in. NPT
- H. Optical path
- I. Net Safety Air particle monitor (APM)
- J. Internal window/sensor chamber
- K. Optical path protector plate. Uncrew to clean. Refer to [Clean sensor](#) for cleaning instructions.
- L. Net Safety Millennium faceplate

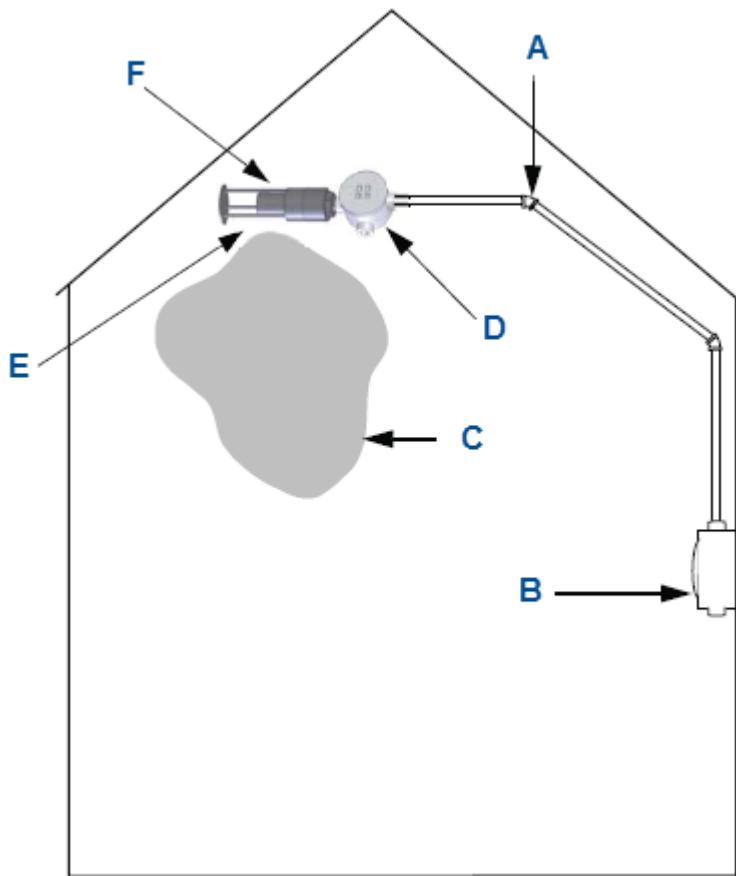
2.2

Locate sensor

Prior to the installation process, develop a location plan for placing the Net Safety APM Sensor and Transmitter. Proper location of the sensor is essential for providing maximum protection. The most effective placement and number of detectors vary depending upon conditions. Consider the following points when planning the installation.

- Carefully locate the sensor in an area where particulate may potentially accumulate.
- Locate the sensor where it is safe from potential sources of contamination, such as oil film, dirt, etc.
- Locate the transmitter where it will be accessible and visible.
- Mount the sensor so air currents allow particulate to flow into the optical path of the sensor.
- If the particulate is expected to be moving horizontally due to air currents, orient the sensor for maximum detection as shown in [Figure 2-1](#).
- Avoid exposure to excessive heat or vibration whenever possible, because this can cause premature failure of electronic devices.
- Seek advice from experts and refer to various regulatory publications that discuss general guidelines for your industry.
- The detector works off of the principle of infrared energy being reflected off of particulate matter passing through the optical path of the detector. Therefore, give careful consideration when installing the detector to ensure that external infrared light does not reach the sensing element.

[Figure 2-2](#) illustrates a typical installation of a Net Safety APM sensor and transmitter. The sensor is mounted separately from the transmitter using the supplied junction box. The transmitter is located at eye level, while the sensor is located where particles are most likely to accumulate. The conduit then connects the two devices.

Figure 2-2: Typical Installation

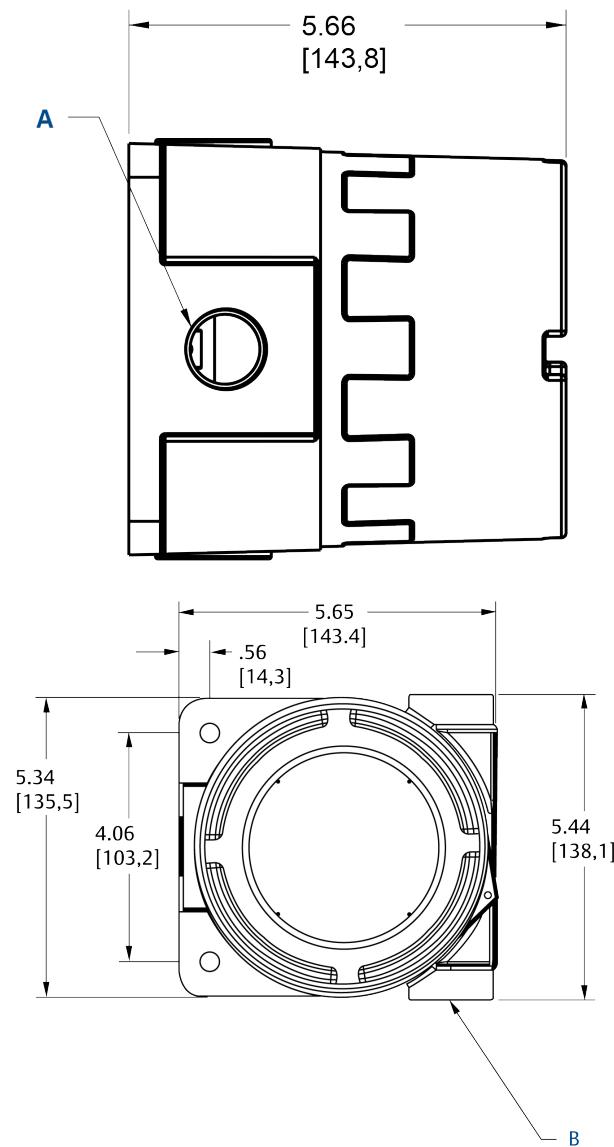
- A. Conduit connecting junction box and controller
- B. Controller/transmitter mounted at eye level
- C. Particulate matter
- D. Junction box
- E. Net Safety APM sensor positioned so air current allows particulate matter to flow into sensor
- F. Net Safety APM sensor

2.3

Dimensions

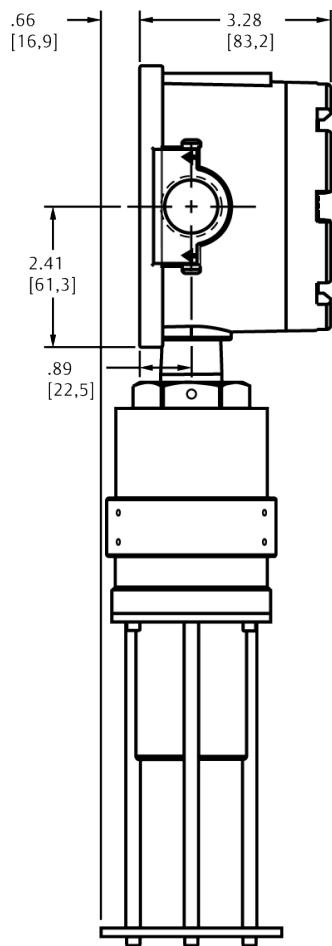
The following figures outline the dimensions of the Net Safety APM connected directly to the Net Safety Millennium Transmitter (Figure 2-3) or when connected directly to the multi-purpose junction box (Figure 2-4). There are three $\frac{3}{4}$ -in. national pipe thread (NPT) conduit entries available on the transmitter. Adapters for M20 and $\frac{1}{2}$ -in. NPT threads are also available as spare parts.

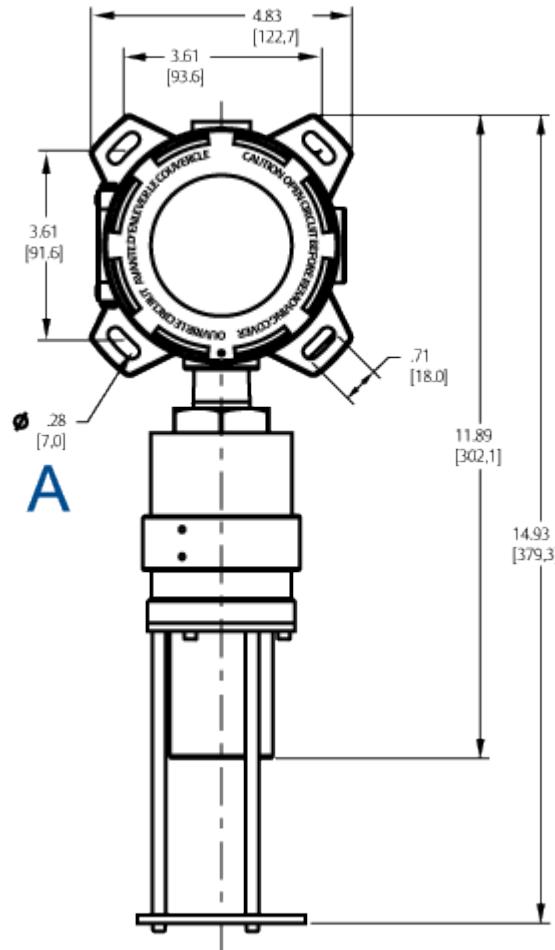
Figure 2-3: Transmitter Dimensions



Dimensions in inches [millimeters].

- A. *3/4-in. female national pipe thread (FNPT) cable entry*
- B. *3/4-in. FNPT cable*

Figure 2-4: Junction Box and Sensor Dimensions



Dimensions in inches [millimeters].

A. *Bracket mounting holes (four places)*

2.4 Mount

The sensor must be mounted directly to either a transmitter or to a separate junction box through a $\frac{3}{4}$ -in. national pipe thread (NPT) conduit entry. Both the transmitter and junction boxes have mounting holes to allow mounting to a wall or pole as desired. Mounting kit hardware is required when mounting the transmitter or junction box to a pole. Contact your local Net Safety representative for detailed information on the pole mounting kits.

Mount the transmitter at eye-level and make it easily accessible for monitoring and maintenance purposes. Place the sensor where particles are likely to accumulate and across the direction of the airflow to allow the particulates to pass through the optical path. To prevent water damage, seal conduit at all points of entry to the transmitter or junction box.

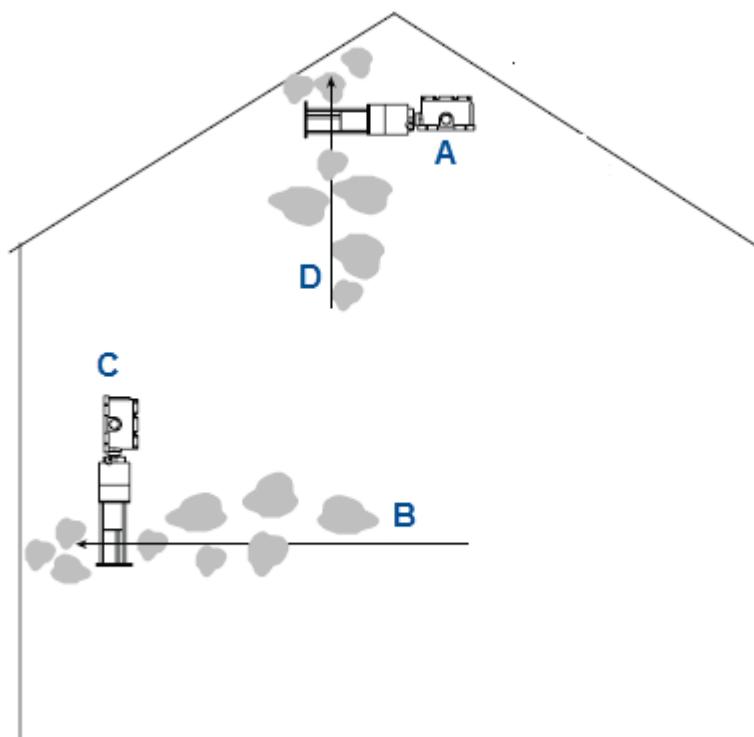
Emerson recommends mounting the sensor such that the air flow will pass through the optical path of the sensor as shown in [Figure 2-5](#).

Note

The detector works off of the principle of infrared energy being reflected off of particulate matter passing through the optical path of the detector. Therefore, give careful consideration when installing the detector to ensure that external infrared light does not reach the sensing element.

Sudden bursts of infrared light may affect the detector; therefore, Emerson recommends putting a time delay (between two and five seconds) into the monitoring system to prevent nuisance alarms.

Figure 2-5: Net Safety APM Mounting Locations



- A. Net Safety APM sensor with junction box
- B. Movement of air particulate matter
- C. Net Safety APM sensor with junction box
- D. Net Safety APM sensor with junction box

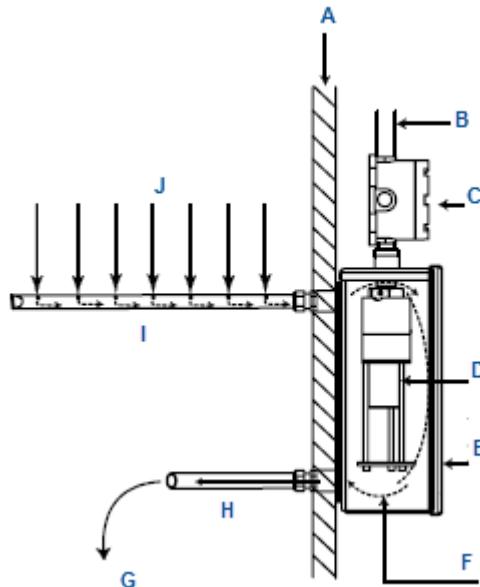
2.4.1 Duct mount

Although the Net Safety™ Monitoring APM has been proven to detect particulate matter travelling at speeds of up to 65.62 feet per second (20 meters per second), the detector is virtually unaffected by the velocity of particulate and air that it is exposed to. Based on the application and the speed of the particulate matter, you can perform a zero and adjust the sensitivity settings to suit the application.

Net Safety recommends using the detector with the UDM-001 or UDM-002 sample draw system to acquire a cross-sectional sample of air and particulate moving through ducts.

The sample is drawn through perforations along the inlet pipe into a chamber where the Net Safety APM is mounted. Particulate matter from the outlet pipe is then returned to the duct. Refer to [Figure 2-6](#) and the [UDM-001/UDM-002 reference manual \(MAN-0116\)](#) for more information.

Figure 2-6: Air Flow Drawing



- A. Duct surface
- B. Conduit to controller
- C. Junction box
- D. Net Safety APM sensor
- E. UDM-001/UDM-002 duct mount
- F. Broken lines indicate direction of air flow
- G. Direction of outlet air sample
- H. Outlet pipe
- I. Perforated sample draw tube (inlet pipe)
- J. Direction of air sample flow

2.5 Wire

2.5.1 Install in field

⚠ WARNING

Electrical shock

Electrical shock could cause death or serious injury

Ensure that only qualified personnel perform the installation.

Use extreme caution when making contact with the leads and terminals.

Do not open the transmitter, sensor, or junction box enclosure when in a classified area or where an explosive atmosphere may be present unless the power to the transmitter has been removed.

Avoid touching electronic components as they are susceptible to electrostatic discharge (ESD). Refer to [Electrostatic sensitive device](#) for more information.

Avoid contact with the non-metallic enclosure label as contact may create an electrostatic charging hazard.

NOTICE

Wiring codes and regulations may vary. ATEX requires that supply connections wiring must be rated at least 5 °C above the maximum ambient temperature of 185 °F (85 °C). Wiring must comply with all applicable regulations relating to the installation of electrical equipment in a hazardous area and is the installer's responsibility. If in doubt, consult a qualified official before wiring the system.

When separating the sensor from the transmitter, Emerson highly recommends the use of shielded cable to protect against interference caused by extraneous electrical or electromagnetic noise to meet mandatory CE mark electromagnetic compatibility (EMC) requirements. In applications where the wiring is installed in conduit, do not use the conduit for wiring to other equipment.

2.5.2 Seals

Emerson recommends using seals to further protect the system against any unwanted water ingress and installing equipment according to applicable local electrical codes. Emerson especially recommends seals for installations that use high-pressure or steam cleaning devices in proximity to the transmitter and/or sensor.

- Emerson recommends water-proof and explosion-proof conduit seals to prevent water accumulation within the enclosure.
- Locate seals as close to the device as possible and not more than 18 in. (46 cm) away.
- Explosion-proof installations may require an additional seal where conduit enters a non-hazardous area. Ensure conformity with local wiring codes.
- When pouring a seal, use a fiber dam to assure proper formation of the seal. Never pour seals at temperatures below freezing.

- Strip back the jacket and shielding of the cable to permit the seal to form around the individual wires. This will prevent air, particles, and water leakage through the inside of the shield and into the enclosure.
- Emerson recommends using explosion-proof drains and conduit breathers. In some applications, alternate changes in temperature and barometric pressure can cause breathing which allows moist air to enter and circulate inside the conduit. Joints in the conduit system are seldom tight enough to prevent this breathing.

2.5.3

Separate sensor and transmitter

Since the sensor must be located where it will pick up particulate in an air flow and the transmitter must be where it is easily reached, you may have to separate the transmitter and sensor. Do this with the aid of the included sensor separation kit (SEP). This kit is composed of a junction box and terminal strip. Refer to the [Net Safety Multi-purpose Junction Box manual \(MAN-0081\)](#) for terminal designation.

The maximum separation distance between the sensor and the transmitter is limited by the resistance of the connecting wiring, which is a function of the gauge of wire being used. Net Safety recommends that sensor separation must not exceed 2,000 ft. (610 m) while using 16 AWG (1.31 mm²) wire. Refer to [Wire resistance table](#) for wire gauges and resistance values.

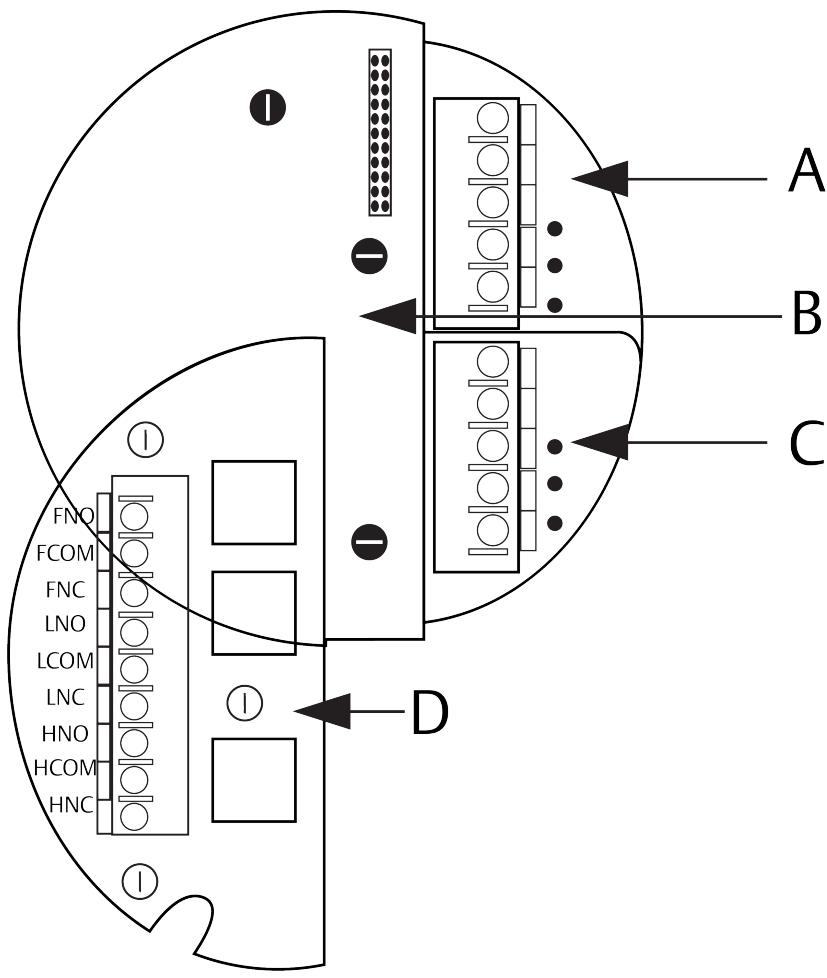
Note

When the sensor is separated from the transmitter, always ensure that the transmitter is supplying the required voltage to the sensor terminals inside the junction box. If you are not using a 4-20 mA signal, connect a jumper between the 4-20 terminal and the COM terminal on the transmitter terminal board.

2.5.4

Assemble boards

There are three different fixed boards and a relay board which make up the PCB assembly. Simply loosen the three locking standoffs, remove one board, insert the other board, and tighten screws. The boards are susceptible to electrostatic discharge (ESD). Refer to [Electrostatic sensitive device](#) for further information on proper handling of this equipment.

Figure 2-7: Transmitter Module Boards

- A. Terminal board
- B. Option board
- C. Sensor board
- D. See [Table 2-1](#)

Table 2-1: Electromechanical Relay Board

PNO	Fault	Normally open
PCOM		Common
PNC		Normally closed
LNO	Clean window (low)	Normally open
LCOM		Common
LNC		Normally closed
HNO	Alarm	Normally open
HCOM		Common

Table 2-1: Electromechanical Relay Board (continued)

HNC	Normally closed
-----	-----------------

2.5.5 Install to transmitter or junction box

The sensor is supplied with a $\frac{3}{4}$ -in. national pipe thread (NPT) male conduit connection and is intended to be mounted directly to an available $\frac{3}{4}$ -in. NPT conduit entry on the transmitter or remotely using the supplied junction box.

Tightly thread the sensor to the transmitter or junction box. Engage a minimum of seven threads to ensure proper water ingress protection and the explosion proof rating of the devices. Take proper care to ensure that no damage is caused to the wires on the sensor and circuit board inside the transmitter and junction box.

Emerson recommends using conductive grease on the threads.

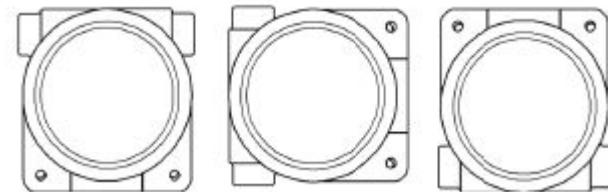
You can mount the sensor in a number of configurations to ensure that air particulate will pass through the optical path of the sensor. Emerson recommends mounting the Net Safety APM horizontally to ensure that build-up of dirt, dust, and debris will not affect the operation of the sensor.

2.5.6 Rotate faceplate

In some applications, you may need to mount the transmitter in a non-standard orientation. To accommodate such installations and ensure that the display will appear at the correct angle for viewing, you can rotate the PCB assembly inside the transmitter's housing.

[Figure 2-8](#) outlines non-standard orientations of the transmitter.

Figure 2-8: Non-standard Orientation



⚠ WARNING

Explosions

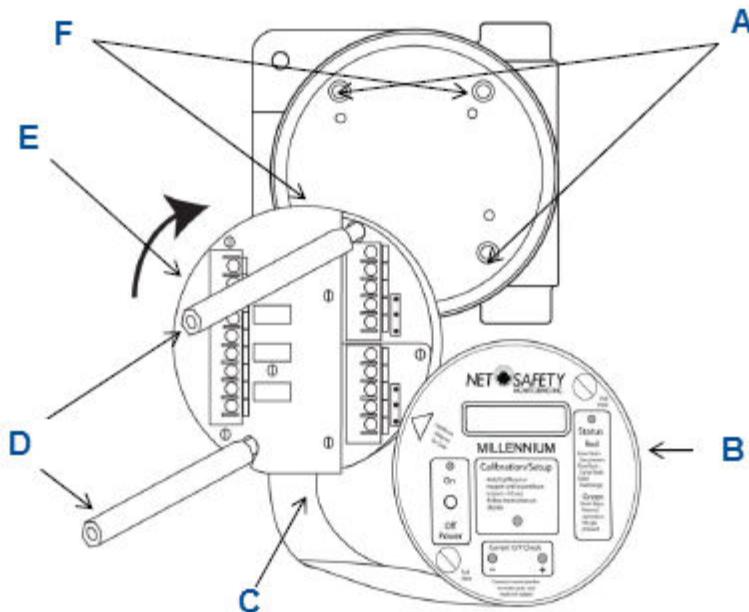
Do not open the transmitter, sensor, or junction box enclosure when in a classified area or when an explosive atmosphere may be present unless the power to the transmitter has been removed.

Refer to [Figure 2-9](#) for the components in the transmitter housing. The boards may be susceptible to ESD. Refer to [Electrostatic sensitive device](#) for further information on proper handling of this equipment.

Procedure

1. Remove the transmitter housing cover.
2. Turn the power to the transmitter off.
3. Unscrew both the knobs marked "Pull Here".
4. Lift the transmitter faceplate from the housing and allow the faceplate to hang from the ribbon cable.
5. Unscrew the two metal standoffs.
6. Carefully remove the PCB assembly from the housing.
The rotator plate is secured to the bottom of the housing and is accessible after the PCB assembly has been removed.
7. Rotate the PCB assembly to the desired position and line up the standoffs with the mounting holes.
8. Insert standoffs in the appropriate horizontal or vertical mounting holes.
9. Tighten standoffs to secure the PCB assembly.
10. Replace faceplate and tighten Pull Here knobs.
11. Return power to the detector and replace the housing cover.

Figure 2-9: PCB Assembly Rotated



- A. Horizontal mounting holes
- B. Faceplate
- C. Ribbon cable
- D. Standoffs
- E. PCB assembly
- F. Vertical mounting holes

2.5.7 General requirements

⚠ WARNING

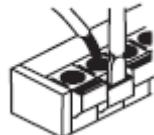
Explosions

Do not open the transmitter, sensor, or junction box enclosure when in a classified area or when an explosive atmosphere may be present unless the power to the transmitter has been removed.

When connecting cable wires, use a small screwdriver to gently press down and hold the spring connector open. Insert the appropriate wire into the open connector hole, releasing the screwdriver to secure the wire as shown in [Figure 2-10](#).

The connector accommodates wire sizes between 14 and 20 AWG.

Figure 2-10: Terminal Connection

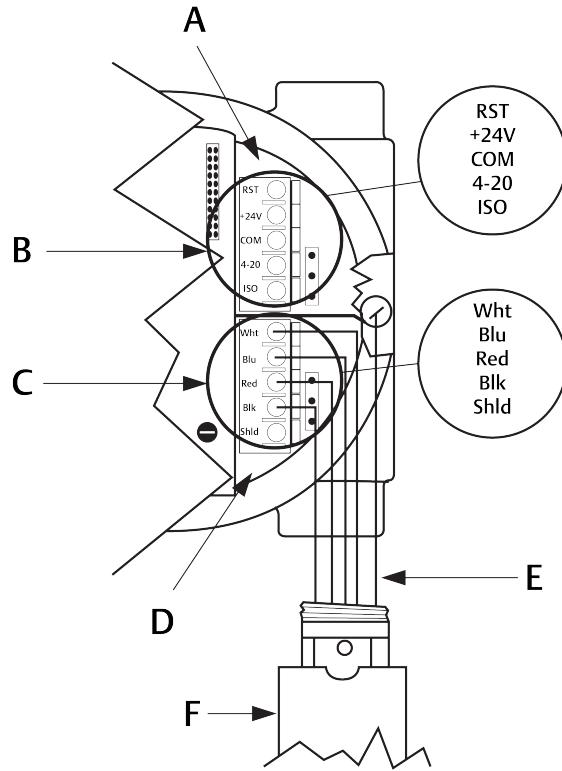


2.5.8 Wire sensor to transmitter

Connect the sensor wires to the transmitter as shown in [Figure 2-11](#). [Table 2-2](#) outlines the wire colors and their purpose.

Table 2-2: Sensor Wire Colors and Terminal Definition

Wire color	White	Blue	Red	Black	Shield
Marking	+24 Vdc	Signal A	Signal B	COM(-)	Shld
Function	10.5-32 Vdc connection	Communication signal A	Communication signal B	Common / supply ground	Earth ground

Figure 2-11: Sensor Wiring

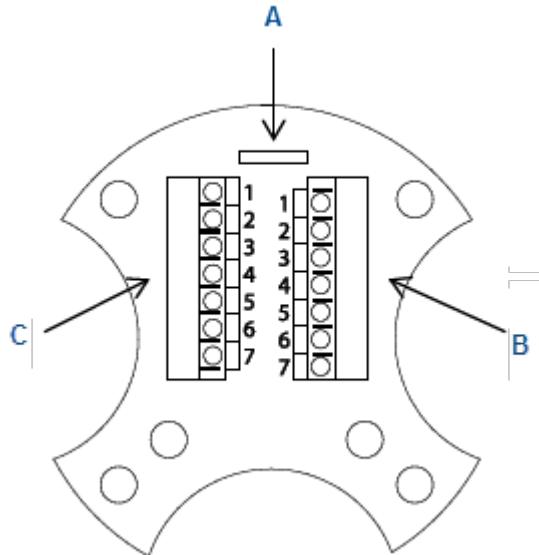
- A. Terminal board
- B. RST
+24 V
COM
4-20
ISO
- C. White
Blue
Red
Black
Shield
- D. Sensor wires
- E. Sensor
- F. Sensor board
- G. Sensor terminals
- H. Power terminals

2.5.9

Wire sensor to junction box

Sensor wiring side refers to wiring between the sensor and junction box. Transmitter wiring side refers to wiring between the transmitter and junction box.

Figure 2-12: Junction Box Wiring (Model JB-MPD)



- A. Resistor - 120 ohms
- B. See [Table 2-3](#)
- C. See [Table 2-4](#)

Note

Terminate the shield at earth ground at panel/PLC/DCS/RTU.

Table 2-3: Transmitter Wiring

Terminal	Function/marking
1 (GND)	Earth ground
2	Vdc (+)
3	COM (-)
4	Sig A
5	Sig B
6	Not used
7	Not used

Table 2-4: Sensor Wiring

Terminal	Color	Function
1 (GND)	Green	Earth ground
2	White	Vdc (+)
3	Black	COM (-)
4	Blue	A (communication)

Table 2-4: Sensor Wiring (continued)

Terminal	Color	Function
5	Red	B (communication)
6	N/A	Not used
7	N/A	Not used

2.5.10 Wire transmitter to control system

Connect the transmitter to the control system as shown in [Figure 2-11](#). [Table 2-5](#) outlines the terminal marking and their purpose.

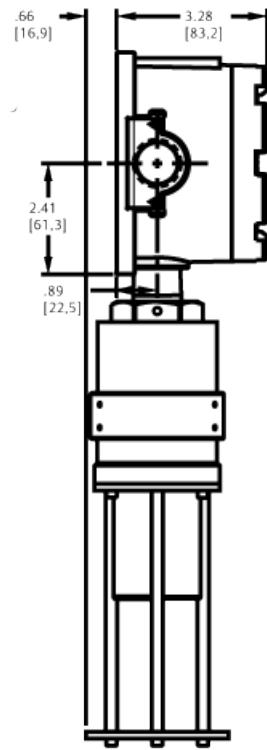
Table 2-5: Transmitter Connections

Marking	Function
RST	Remote reset
+24V	10.5-32 Vdc connection
COM	Common/supply ground
4-20	Current loop output (mA)
+VISO	+24 Vdc isolated 4-20 power

2.5.11 External ground

In order to ensure proper operation of the sensor, Emerson recommends connecting an external ground to the grounding point on the enclosure. Refer to [Figure 2-13](#) for grounding connection location.

Figure 2-13: External Grounding Point



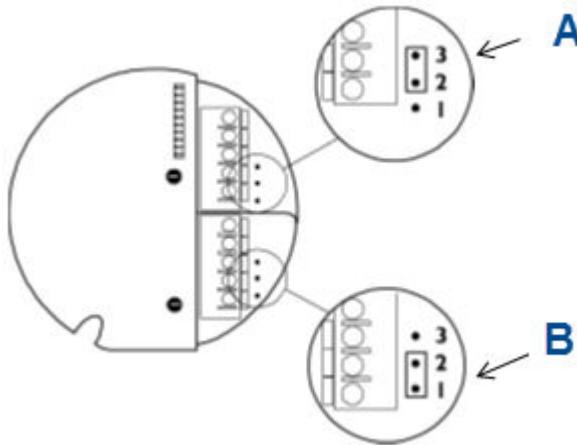
2.6

Current output

To set the current output, simply move the jumper located on the terminal board near the power terminals, to the isolated or non-isolated current position. Refer to [Figure 2-14](#).

Note

Unless otherwise specified, all models ship with this jumper in the non-isolated current position (Pin 2 and Pin 3 jumped). Refer to [Figure 2-14](#).

Figure 2-14: Jumper Locations

- A. Jumper positions to set power source for current output.
Isolated and non-isolated current jumper - place jumper (shorting jack) over Pin 3 and Pin 2 (default position) for non-isolated configuration (source).
- B. Place jumper over Pin 1 and Pin 2 for remaining configurations. Refer to [Figure 2-1](#).

2.7

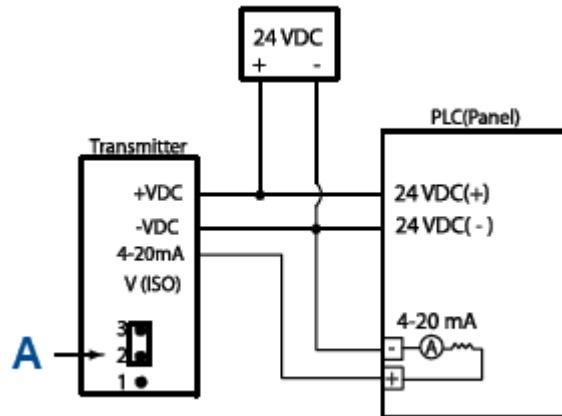
Non-isolated and isolated power configurations

For current source using non-isolated configuration, the jumper must remain in the default position (Pin 2 and Pin 3 jumped). The jumper is placed over Pin 1 and Pin 2 for current sink using non-isolated configuration.

For isolated configuration using a separate power supply to isolate the current loop, the jumper must be placed over Pin 1 and Pin 2 for source and sink. Refer to [Figure 2-15](#), [Figure 2-16](#), [Figure 2-17](#), and [Figure 2-18](#).

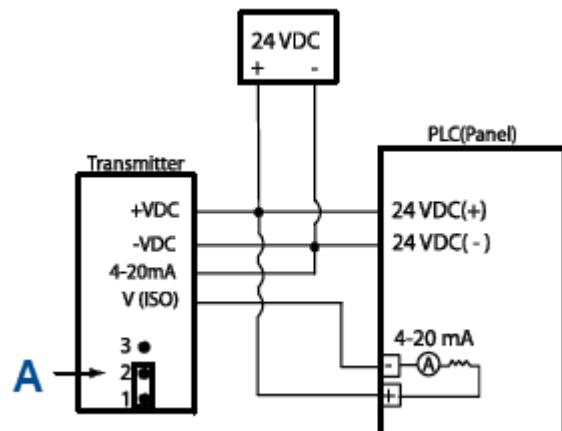
Note the jumper position for each configuration.

Figure 2-15: Detector Non-Isolated Configuration (Source)

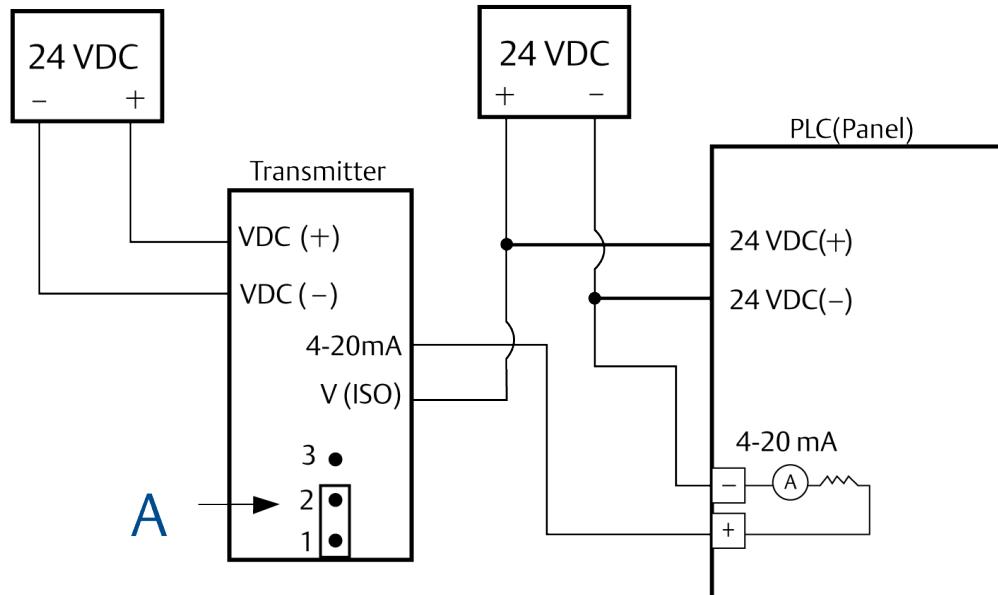


A. Isolated and non-isolated jumper pins

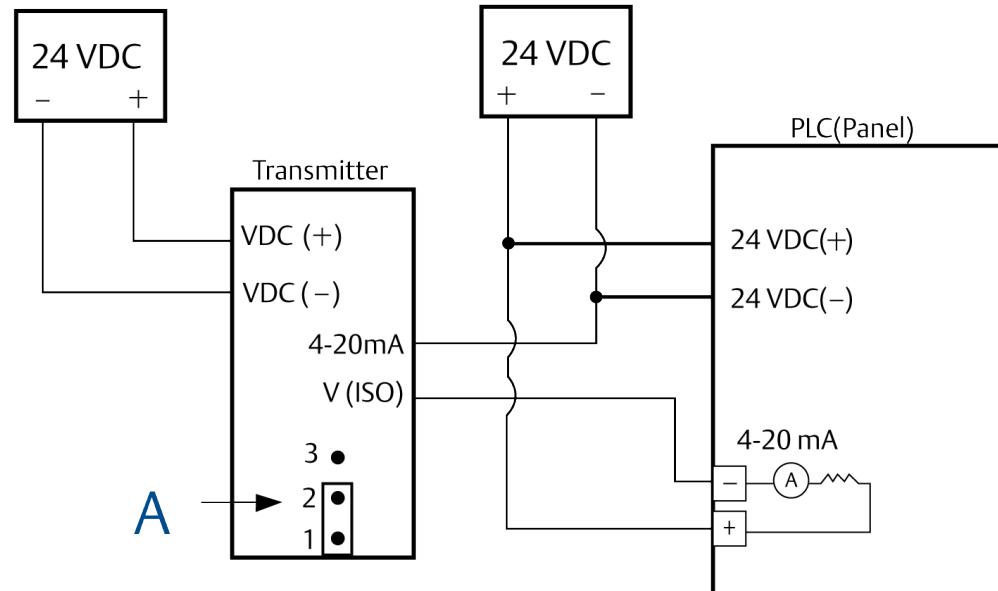
Figure 2-16: Detector Non-Isolated Configuration (Sink)



A. Isolated and non-isolated jumper pins

Figure 2-17: Detector Isolated Configuration (Source)

A. Isolated and non-isolated jumper pins

Figure 2-18: Detector Isolated Configuration (Sink)

A. Isolated and non-isolated jumper pins

2.8 Installation checklist

Review the following checklist prior to turning the power on to the transmitter after installation has been completed:

- Ensure that the transmitter and sensor are properly and firmly mounted.
- Ensure that stopping plugs are securely tightened on any unused conduit entries.
- Ensure that the transmitter and sensor are not obstructed, such that they are accessible and the particulate matter is not inhibited from reaching the sensors optical path.
- Ensure adherence to applicable local guidelines and requirements on wiring and sealing of equipment in hazardous and non-hazardous areas.
- Ensure that proper shielding and grounding practices are adhered to and local codes are being followed.
- Check system operational voltage and conditions and ensure that they are within the applicable specifications of the transmitter and sensor.
- Verify wiring at all termination and junction points (transmitter, junction box, and power supply).
- Ensure that the transmitter housing cover and sensor cap are tightly secured.

3 Operation

3.1 Transmitter components

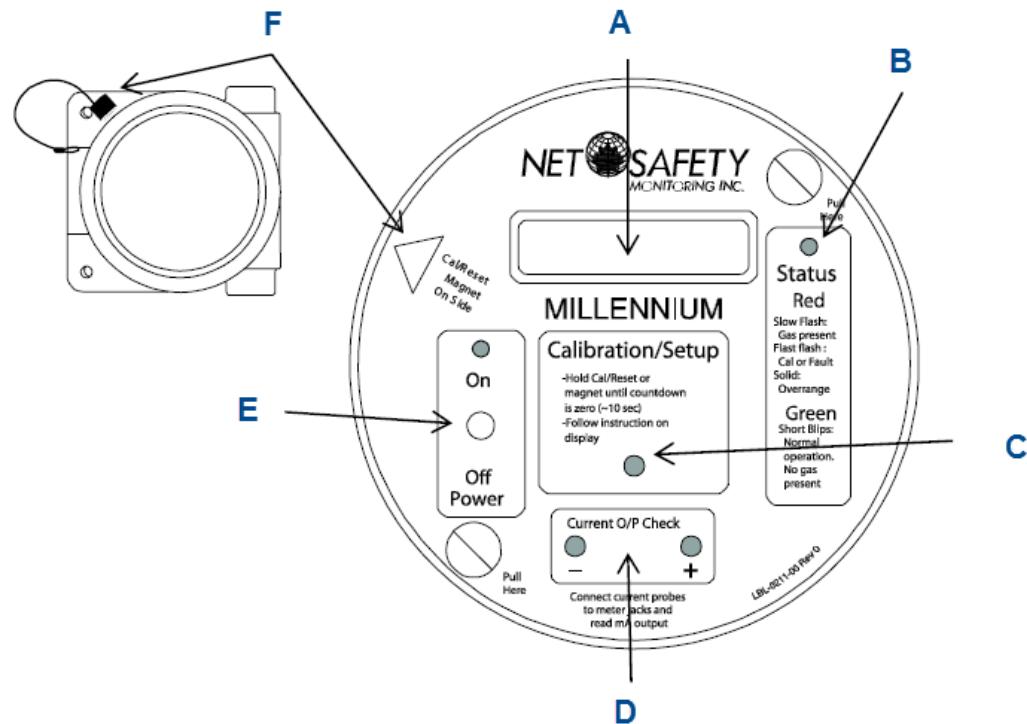
⚠ WARNING

EXPLOSION

Do not open the transmitter, sensor, or junction box enclosure when in a classified area or when an explosive atmosphere may be present unless the power to the transmitter has been removed.

Figure 3-1 outlines the components on the transmitter, and the subsequent sections provide explanations for each component.

Figure 3-1: Transmitter Layout



- A. [Display](#)
- B. [Status LED](#)
- C. [Setup button](#)
- D. [Current output check](#),
- E. [On/Off switch](#)
- F. [Magnetic reed switch](#)

3.1.1 Display

The transmitter comes with a scrolling eight character display to show various status messages and prompts.

Refer to [Table 3-1](#) for the various display messages.

3.1.2 Status LED

The status LED provides a visual indication of the status of the transmitter and sensor.

Refer to [Indications and outputs](#) for specific status conditions of the LED.

3.1.3 On/Off switch

Use the **On/Off** switch to turn power to the transmitter and sensor on and off.

As the transmitter's housing must be opened to access the **On/Off** switch, make sure to de-classify the area where the transmitter is located prior to using the switch.

3.1.4 Setup button

The **Setup** button provides access to the transmitter's main menu, which in turn allows options to be reviewed and set. You can also use the **Setup** button to zero the sensor.

As the transmitter's housing must be opened to access the button, make sure to de-classify the area before using the button. Refer to [Program](#) for instructions on programming the transmitter.

3.1.5 Magnetic reed switch

Emerson provides the magnetic reed switch to avoid opening the housing in an environment where gas may be present.

The magnetic reed switch functions in the same manner as the **Setup** button but in a non-intrusive manner. The magnet comes permanently attached to the side of the transmitter.

3.1.6 Check current output

Emerson provides current output check test jacks to facilitate current loop measurements without breaking external current loop. To take current loop measurements, ensure wiring is correct and current loop is closed, and then follow the steps below:

Procedure

1. Set meter on mA scale and insert meter leads into test jacks.
2. Put external devices in bypass, if necessary, to avoid unwanted alarm response.
3. Perform simulated tests to check output.
4. Remove meter leads from test jacks and return external devices to normal.

3.2 Indications and outputs

Table 3-1: Transmitter Indications

State	Current output	Status LED	Display
Main menu entered	3.0 mA	Solid green	Main menu items
Normal operation	4.0 mA	Green blip	Clear
Startup delay	3.0 mA	Slow red flash	Start delay
Dirty optics	3.3 mA	Fast red flash	Dirty chamber
Particulate present	20 mA	Red blip	Alarm
Fault condition	2.5 mA	Fast red flash	Fault
Updating sensor	3.0 mA	Slow red flash	Busy

3.3 Alarms

3.3.1 Transmitter fault

To ensure proper response, the transmitter features self-testing circuitry that continuously checks for problems. When power is applied, the system automatically begins a test to ensure proper functionality.

During normal operation, the transmitter continuously monitors the signal from the internal Net Safety™ APM source. If the transmitter determines that the Net Safety APM program is not running correctly, it will reset the sensor.

3.3.2 Clean window/dirty chamber

Over an extended period, oily film or particulate build-up on the sensor window may obscure the detector. When dirty, the Clean window alarm trips, the message **Dirty Chamber** displays, the Status LED flashes fast red, and the current output is 3.3 mA.

Refer to [Set sensitivity](#) to define the clean window sensitivity and [Clean sensor](#) for instructions on cleaning the Net Safety APM window.

3.3.3 Particulate alarm

When particulate is present in the detector's chamber, the message `Alarm` displays, the Status LED blips red, and the current output is 20.0 mA.

If the relay has been set to non-latching, the unit resets itself; if set to latching, a manual or remote reset is required to clear the alarm condition. Refer to [Reset](#).

Note

Sudden bursts of infrared light may affect the detector; therefore, Emerson recommends that a time delay (between two and five seconds) be put into the monitoring system to prevent nuisance alarms.

3.4 Reset

3.4.1 Remote reset

The detector is capable of remote reset.

A normally open push-button switch must be connected between the RST terminal and the COM terminal on the terminal board. If relay is set to Latching, a remote reset is possible.

3.4.2 Manual reset

If a relay is set to Latching, a manual reset is required to clear the alarm condition.

Simply place and hold the magnet against the reed switch or press and hold **Setup** for three to five seconds. The detector returns to normal operation.

3.5 Normal

With no particulate present and no fault detected, the display reads `Clear`, Status LED blips/blinks green, and the current output is 4.0 mA.

3.6 Outputs

3.6.1 Relays

All relay outputs have FORM-C SPDT contacts rated 5 amperes at 30 Vdc/250 Vac. Relays are dry contacts.

3.6.2 Current

The detector uses a 4-20 mA dc current output to transmit the alarm status and fault conditions to other devices.

You can wire this output for isolated or non-isolated operation. A 4.0 mA output indicates normal operation; a 20.0 mA output indicates that the alarm threshold has been exceeded. Current output of 2.5 mA indicates the presence of a system fault. Current output of 3.3 mA indicates a build-up of particulate in the sensor's chamber or dirty window. Refer to [Indications and outputs](#) for additional indications and outputs.

3.7 Sensor

3.7.1 Power up sensor

When the transmitter applies power to the sensor, a warm-up routine begins, and the sensor is automatically tested to ensure proper functioning.

The warm-up time for the sensor is typically 150 seconds. After the warm-up cycle has completed, the display reads **Clear**.

As part of the self-diagnostic routine of the transmitter, the analog output outputs 20 mA on initial power up for a period not greater than 450 milliseconds. If routine power loss is expected on the system, take appropriate actions to limit false alarm conditions due to this diagnostic routine.

3.7.2 Sensor communication

The Net Safety APM sensor uses a proprietary protocol to communicate with the Net Safety Millennium transmitter.

Never connect the Net Safety APM sensor to any device other than a Net Safety Millennium transmitter. If any problems develop, please refer to [Troubleshooting](#).

4 Program

4.1 Main menu

The **Main Menu** provides access to various functional settings and viewing of current settings. The following options/settings are available in the **Main Menu**.

- Set Zero
- Sensitivity Settings
- Review Relay Settings
- Set Relay Options
- Select Display Language

4.2 Access the main menu

There are two ways to access the **Main Menu**: the **Setup** button on the faceplate of the transmitter or the magnetic reed switch.

- Press and hold the **Setup** button to access the **Main Menu**.
- Place and hold the magnet to the transmitter's housing (10 o'clock position as shown in [Figure 3-1](#)) to access the **Main Menu**.

4.3 Use the main menu

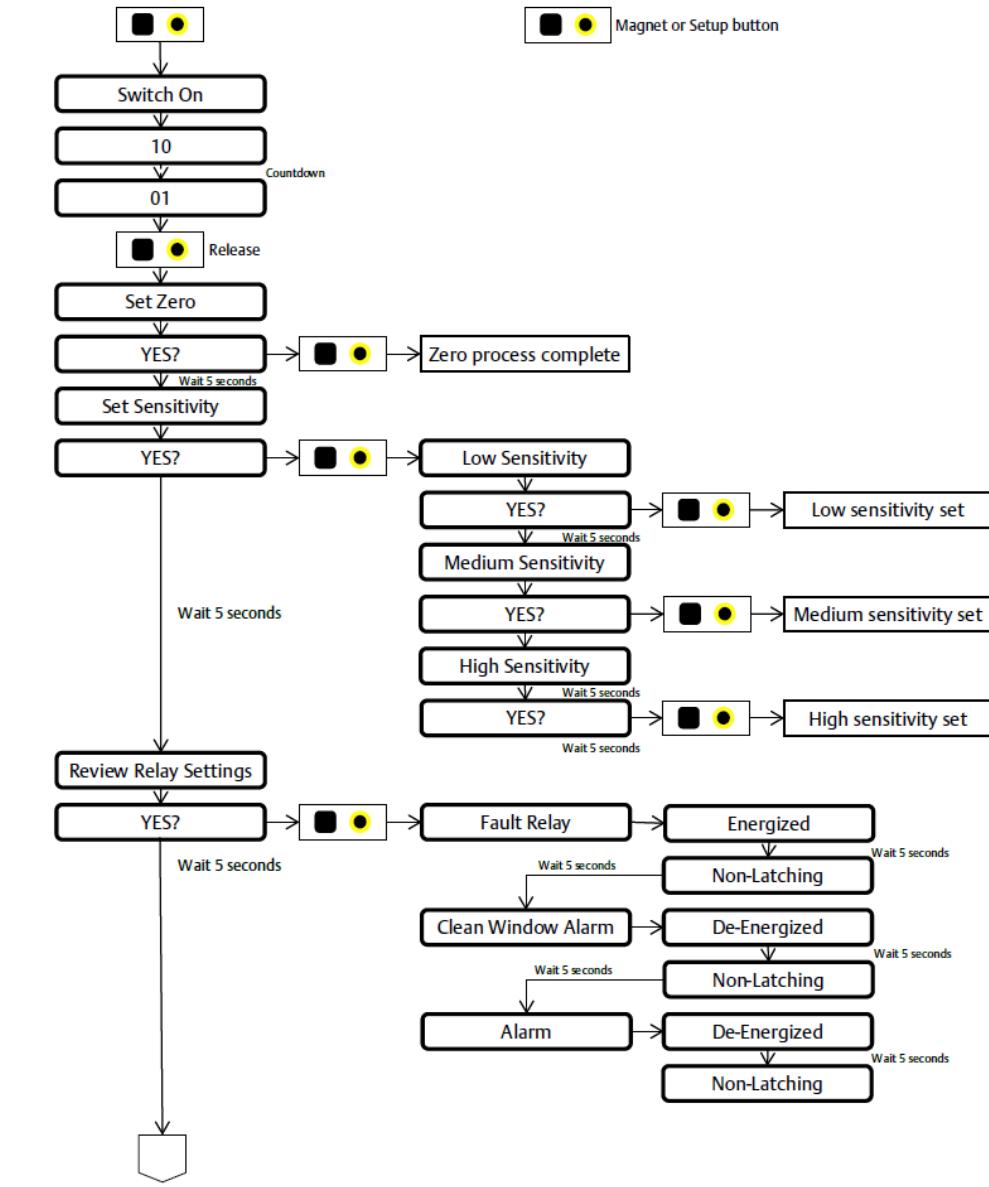
The following steps outline the actions required to navigate through the menu system.

Prerequisites

Ensure that the transmitter is turned on and that no fault is present. If a fault is present, the menu system is not accessible.

Refer to [Figure 4-1](#) for the programming flow chart for the transmitter.

Figure 4-1: Programming Flowchart



Procedure

1. Press and hold **Setup** or hold the magnet next to the triangle on the faceplate as shown in [Figure 3-1](#) until the message **Switch On** displays and the countdown (10 to 0) finishes.
An option scrolls across the display followed by the prompt **YES?**
2. To set/view an option, press **Setup** or place the magnet to the reed switch at the **YES?** prompt. If you do not wish to select that option, wait five (5) seconds until the next option appears and then select **YES?**.
A selection is acknowledged with a flashing **YES**.

If no option is selected, the transmitter returns to the normal operational mode, and the display reads **Clear**.

Important

When you enter the menu system, the current output changes to 3 mA. Ensure that external systems are bypassed, as required, prior to entering the menu system.

4.3.1 Zero transmitter

If at any time the background particulate levels change, you may need to zero the transmitter to the new levels. Emerson recommends zeroing every three months.

Important

After initial power-up, allow the unit to warm up for two to four hours before zeroing.

If the sensor has been in operation for a period of time, Emerson recommends that you clean the window as outlined in [Clean sensor](#).

Prerequisites

Be sure the Net Safety APM is energized up and is not indicating a fault (e.g., the display reads **Clear**, the status LED is blinking green, and the current output is 4.0 mA). Prior to zeroing, ensure that the air surrounding the transmitter is clean and free of particulate or at the accepted background level for the specific application.

Procedure

1. Press and hold **Setup** or hold the magnet to the reed switch to enter the **Main Menu**; wait for the countdown, from 10 to 0, to end.
2. Release **Setup** or remove the magnet from the reed switch.
The current output moves to 3.0 mA.
3. When **Set Zero** and then **YES?** is displayed, press **Setup** or use the reed switch to select this option.
A flashing **YES** confirms your selection.

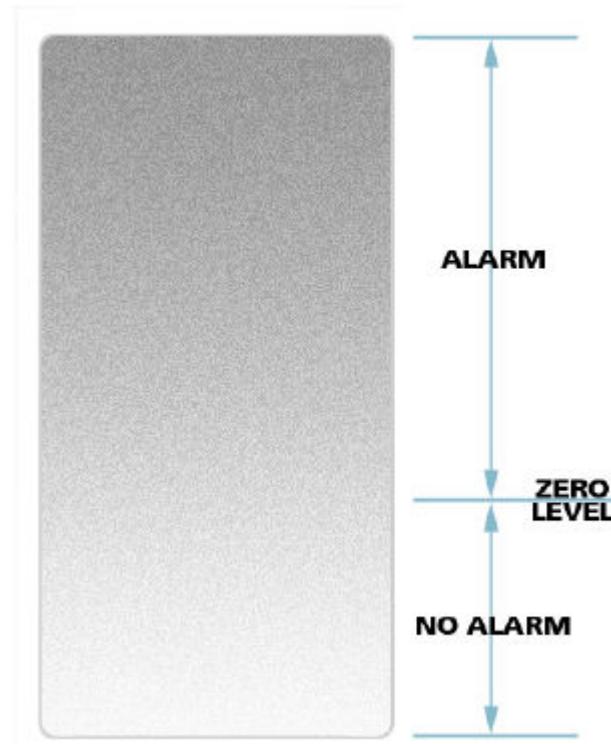
The Net Safety APM has now been zeroed, meaning that the existing level of air contamination is considered normal.

Tip

If your application has a constant level of particulate present that is required to be ignored by the transmitter, you can set the zero level with the known particulate present as shown in [Figure 4-2](#).

To further fine tune the detector's response for your requirements, adjust the sensitivity settings accordingly. Refer to [Set sensitivity](#).

Figure 4-2: Zero Level Setting



4.3.2 Set sensitivity

You can set the detector to detect low, medium, or high sensitivity levels (with high being the most sensitive). By default, the factory sets the sensitivity to high. Follow the steps below to change the sensitivity.

Procedure

1. Press and hold **Setup** or hold the magnet to the reed switch to enter the **Main Menu**; wait for the countdown, from 10 to 0, to end.
2. Release **Setup** or remove the magnet from the reed switch.
The current output moves to 3.0 mA.
3. When **Sensitivity Settings** and then **YES?** is displayed, press **Setup** or use the reed switch to select this option.
A flashing **YES** confirms your selection.
4. The following three options display:
 - Low Sensitivity YES?
 - Medium Sensitivity YES?
 - High Sensitivity YES?

5. When the required setting is displayed, press **Setup** button or use the reed switch to select.
The selection is acknowledged with a flashing YES.

4.3.3 Review relay settings

This is a read-only mode to provide a summary of the relay settings. You cannot change the relay settings from this menu.

Procedure

1. Press and hold **Setup** or hold the magnet to the reed switch to enter the **Main Menu**; wait for the countdown, from 10 to 0, to end.
2. Release **Setup** or remove the magnet from the reed switch.
The current output moves to 3.0 mA.
3. When **Review Relay Settings** and then **YES?** is displayed, press **Setup** or use the reed switch to select this option.
A flashing YES confirms the selection, and the transmitter displays the settings.

4.3.4 Set relay options

This section outlines how to change the normal operation of the Clean Window and Alarm relays.

Follow the steps below to alter the relay functions or refer to [Figure 4-1](#).

Note

The Fault Alarm relay settings are fixed as normally Energized and Non-Latching and are not adjustable within the menu system.

Procedure

1. Press and hold **Setup** or hold the magnet to the reed switch to enter the **Main Menu**; wait for the countdown, from 10 to 0, to end.
2. Release **Setup** or remove the magnet from the reed switch.
The current output moves to 3.0 mA.
3. When **Set Relay Options** and then **YES?** are displayed, press **Setup** or use the reed switch to select.
A flashing YES confirms your selection. The messages **Set Clean Window Alarm** and then **YES?** are displayed.
4. Press **Setup** or use the reed switch to select this option.
The flashing YES confirms this selection. After you choose the Clean Window Alarm option, the message **Coil Status** is displayed followed by **Energized YES?**.
5. To select that the relay be energized under normal conditions, press **Setup** or use the reed switch to select this option.
To select that the relay be de-energized under normal conditions wait five seconds for the next selection.
If you selected Energized, a flashing YES confirms the selection.

6. To select that the relay be de-energized under normal conditions, press **Setup** or use the reed switch to select this option.
If the relay is setup as required, wait five seconds for the next selection.
If you selected De-energized, a flashing YES confirms the selection. The display now shows Latch Status, followed by Latching YES?.
7. To select that the relay be latched in its alarm state, press **Setup** or use the reed switch to select this option.
To select that the relay be non-latching, wait five seconds for the next selection.
If you selected Latching, a flashing YES confirms the selection.
8. To select that the relay be non-latching, press **Setup** or use the reed switch to select this option.
If the relay is setup as required, wait five (5) seconds for the next selection.
If you selected Non-latching, a flashing YES confirms the selection. The messages Set Alarm and then YES? are displayed.

4.3.5 Select display language

This section outlines how to change the main display language to English, Spanish, or French. Follow the steps below to change the display language.

Procedure

1. Press and hold **Setup** or hold the magnet to the reed switch to enter the **Main Menu**; wait for the countdown, from 10 to 0, to end.
2. Release **Setup** or remove the magnet from the reed switch.
The current output moves to 3.0 mA.
3. When Select Display Language and then YES? are displayed, press **Setup** or use the reed switch to select.
A flashing YES confirms your selection. The messages English and then YES? are displayed.
4. Press **Setup** or use the reed switch to select this option.
The flashing YES confirms this selection.
5. If English is not the desired language, wait five seconds for the next selection.
The messages Espanol and then YES? are displayed.
6. Press **Setup** or use the reed switch to select this option.
The flashing YES confirms this selection.
7. If Spanish is not the desired language, wait five seconds for the next selection.
The messages Francais and then YES? are displayed.
8. Press **Setup** or use the reed switch to select this option.
The flashing YES confirms this selection.
9. If French is not the desired language, wait five seconds for the next selection.

5 Maintenance

5.1 Check response

Emerson recommends checking and testing the Net Safety™ APM at least once every three months.

Procedure

1. Spray Smoke Detector Tester (or equivalent product) in the direction of the sensor.

⚠ CAUTION

Equipment damage

Overusing artificial particulate detector testers or spraying from too close a range may cause an oily film to accumulate on the internal window, impairing the operation of the detector.

Stand at least 2 ft. (0.6 m) away from the sensor when spraying the tester.

Typically, a one to two second burst is adequate to initiate an alarm.

When the alarm activates, the display reads `Alarm`, the Status LED flashes red, and the current output is 20.0 mA to indicate detection of particulate matter or canned contaminant.

2. After simulation, reset the alarm if latched as outlined in [Reset](#) and zero the Net Safety Air Particle Monitor as per [Zero transmitter](#) in clean air free of particulates or at the accepted particulate background level for the specific application.

5.2 Clean sensor

Clean the sensor routinely. The frequency of cleaning depends on the application and environment where the sensor is installed.

When the `Dirty Chamber` or `Clean Window Alarm` message is displayed, the lens/window and chamber require cleaning. Follow the steps below when cleaning.

Procedure

1. Turn off power to the transmitter.
2. Unscrew bolts at the end of circular plate and connecting rods.
3. Using conventional multi-purpose or glass cleaning solution, clean the inner sides of the sensor chamber and front side of the lens/window.
Use a lint-free towel or sponge to apply the cleaning solution.
4. Ensure that there is no residue left on the lens or window.
5. Put the circular plate back into position, ensuring that the textured surface faces the detector's window, and screw in the bolts at the end of the connecting rods.
6. Return power to the detector and check for normal operation.

7. Complete the zero procedure ([Zero transmitter](#)) to establish new settings.
If problems develop and persist, contact the Net Safety Service department or refer to [Return of material](#).

5.3 Troubleshooting

Net Safety has not designed the Net Safety Millennium transmitter or the Net Safety APM sensor to be repaired in the field. If a problem develops, carefully check for faulty wiring.

If you determine that the problem is caused by an electronic defect, return the device to the factory for repair (refer to [Service support](#) and [Return of material](#) for instructions).

Perform regular checks on the unit every two to three months to ensure desired operation. Refer to [Check response](#) for instructions.

5.4 Storage

Store the sensor and its electronic components/parts in locations free from dust and moisture. Ensure that the storage temperature is well within the limits of the certified temperatures of the equipment. See [Specifications](#) for storage temperatures.

5.5 Spare parts and accessories

Table 5-1: Spare Parts and Accessories

Description	Part Number
Universal duct mount assembly with 3.3 ft. (1 m) inlet sampling tube	UDM-001
Universal duct mount assembly with 4.9 ft. (1.5 m) inlet sampling tube	UDM-002
Universal duct mount assembly	UDM-003
Magnet assembly	HDW-0118
Replacement Millennium transmitter board	ML7-TX700
Terminal board for JB-MPD	JB-MPD-PCBA
316 stainless steel termination junction box	JB-MPD-S
Conduit reducer - 3/4 in. (19 mm) to M20 - nickel-plated brass	HDW-0148
Conduit reducer - 3/4 in. (19 mm) to M20 - stainless steel	HDW-0147

6

Electrostatic sensitive device

Electrostatic discharge (ESD) is the transfer, between bodies, of an electrostatic charge caused by direct contact or induced by an electrostatic field.

The most common cause of ESD is physical contact. Touching an object can cause a discharge of electrostatic energy. If the charge is sufficient and occurs near electronic components, it can damage or destroy those components. In some cases, damage is instantaneous, and an immediate malfunction occurs. However, symptoms are not always immediate; performance may be marginal or seemingly normal for an indefinite period of time, followed by a sudden failure.

To eliminate potential ESD damage, review the following guidelines:

- Handle boards by the sides, taking care not to touch electronic components.
- Wear grounded wrist or foot straps, ESD shoes, or heel grounders to dissipate unwanted static energy.
- Prior to handling boards, dispel any charge in your body or equipment by touching a grounded metal surface.
- Ensure all components are transported and stored in ESD safe packaging.
- When returning boards, carefully package in the original carton and static protective wrapping.
- Ensure all personnel are educated and trained in ESD control procedures.
- Clean off the housing with a damp cloth only.

In general, exercise accepted and proven precautions normally observed when handling electrostatic sensitive devices.

7

Wire resistance table

Distance feet (meters)	AWG #20 0.5 mm ²	AWG #18 0.8 mm ²	AWG #16 1.0 mm ²	AWG #14 2.0 mm ²
100 (30.5)	1.02	0.64	0.40	0.25
200 (61)	2.03	1.28	0.80	0.51
300 (91.4)	3.05	1.92	1.20	0.76
400 (121.9)	4.06	2.55	1.61	1.01
500 (152.4)	5.08	3.20	2.01	1.26
600 (182.9)	6.09	3.83	2.41	1.52
700 (213.4)	7.11	4.47	2.81	1.77
800 (243.8)	8.12	5.11	3.21	2.02
900 (274.3)	9.14	5.75	3.61	2.27
1,000 (304.8)	10.20	6.39	4.02	2.53
1,250 (381)	12.70	7.99	5.03	3.16
1,500 (457.2)	15.20	9.58	6.02	3.79
1,750 (533.4)	17.80	11.20	7.03	4.42
2,000 (609.6)	20.30	12.80	8.03	5.05
2,250 (685.8)	22.80	14.40	9.03	5.68
2,500 (762)	25.40	16.00	10.00	6.31
3,000 (914.4)	30.50	19.20	12.00	7.58
3,500 (1066.8)	35.50	22.40	14.10	8.84
4,000 (1219.2)	40.60	25.50	16.10	10.00
4,500 (1371.6)	45.70	28.70	18.10	11.40
5,000 (1524)	50.10	32.00	20.10	12.60
5,500 (1676.4)	55.80	35.10	22.10	13.91
6,000 (1828.8)	61.00	38.30	24.10	15.20
6,500 (1981.2)	66.00	41.50	26.10	16.40
7,000 (2133.6)	71.10	44.70	28.10	17.70
7,500 (2286)	76.10	47.90	30.10	19.00
8,000 (2438.4)	81.20	51.10	33.10	20.20
9,000 (2743.2)	91.40	57.50	36.10	22.70
10,000 (3048)	102.00	63.90	40.20	25.30

Resistance shown is one way. This figure must be doubled when determining closed loop resistance.

8 Specifications

Table 8-1: Electrical Specifications

Specification	Value
Operating voltage range	10.5 to 32 Vdc
Power consumption	3.24 W max at 12 Vdc 3.6 W max at 24 Vdc
Current output	4-20 mA into a maximum loop impedance of 800 ohms at 32 Vdc or 150 ohms at 10.5 Vdc isolated or non-isolated loop supply

Table 8-2: Environmental Specifications

Specification	Transmitter	Sensor	Junction box
Storage temperature	-40 to +185 °F (-40 to +85 °C)	-40 to +167 °F (-40 to +75 °C)	-40 to +185 °F (-40 to +85 °C)
Operating temperature	-40 to +185 °F (-40 to +85 °C)	-40 to +167 °F (-40 to +75 °C)	-40 to +185 °F (-40 to +85 °C)
Relative humidity	0-100% relative humidity, non-condensing		

Material of construction

Stainless steel (SS316)

Table 8-3: Ingress Protection

Product	Ingress protection rating
Transmitter	<ul style="list-style-type: none"> • Type 4X • IP66, IP67 (IECEx stainless steel)
Junction box	<ul style="list-style-type: none"> • Type 4X • IP67
Sensor	<ul style="list-style-type: none"> • Type 4X • IP65

Table 8-4: Weight

Product	Weight
Transmitter	Stainless steel: 7.0 lb (3.2 kg)
Sensor	Stainless steel: 4.0 lb (1.8 kg)
Junction box	Stainless steel: 3.5 lb (1.6 kg)

Distance between sensor and transmitter

Up to 2,000 ft. (610 m) with 16 AWG (1.31 mm²) wire

Warranty

Electronics: Three years

Sensors: Two years

9 Certifications

9.1 North American hazardous locations

9.1.1 Transmitter



Class I, Division 1, Groups B, C, and D T5

Class I, Zone 1 Ex d IIB+H₂ T5 AL Version Only

-55 °C ≤ Ta ≤ +85 °C

Type 4X

9.1.2 Net Safety™ Air Particle Monitor sensor



Class I, Division 1, Groups B, C, and D T5

Class I, Zone 1, AEx db IIB+H₂ T5 Gb

Ex db IIB+H₂ T5 Gb

IP65, Type 4X

-40 °C ≤ Ta ≤ +75 °C

1. The ability of this apparatus to function properly in a hazardous environment has not been tested by CSA.

9.1.3 Junction box (Model JB-MPD)



Class I, Division 1, Groups B, C, and D Class I Zone 1, AEx d/Ex d IIB+H₂ T5

-50 °C ≤ Ta ≤ +85 °C

Type 4X, IP67

9.2 ATEX (-X model)

9.2.1 Transmitter

CE 0598 Ex II 2 G Ex db IIB+H₂ T5, IP66

-40 °C ≤ Ta ≤ +85 °C

Presafe 16 ATEX 8594X

Special Conditions for Safe Use

1. All cable glands, blanking elements, and thread adapters must be suitably certified as Ex d and maintain the IP66 rating of the enclosure.
2. To minimize the risk of electrostatic charge, provisions shall be made for adequate grounding of equipment. Equipment shall be installed in such a manner that accidental discharge should not occur.
3. For ambient temperature above 158 °F (70 °C), care shall be taken to select cable that is suitably rated for the intended ambient temperature range.
4. Flameproof joints are not intended to be removed.

9.2.2 Net Safety Air Particle Monitor sensor

CE 0598 Ex II 2 G Ex db op is IIB+H₂ T4 Gb

-40 °C < Ta < +75 °C

IP65

SIRA 17ATEX1242X

EN 60079-0:2012/A11:2013

EN 60079-1:2014

Special Conditions for Safe Use

1. The integral conductors shall be suitably mechanically protected and terminated in a suitable certified terminal or junction facility.
2. It is the user's responsibility to ensure that the earth continuity of the equipment is maintained via the mounting arrangement.
3. Flamepath joints are not intended to be repaired.

9.2.3 Junction box (Model JB-MPD)



CE 0598 Ex II 2 G Ex d IIB+H₂ T5

-55 °C ≤ Ta ≤ +85 °C IP67

FM07ATEX0044

9.3 IECEx (-X model)

9.3.1 Transmitter (stainless steel)

Ex d IIB+H₂ T5 Gb

-55 °C ≤ Ta ≤ +85 °C

Certificate Number: IECEx FMG 13.0035X

IEC 60079-0:2011/IEC 60079-1:2007/IEC 60529:2001

Consult the manufacturer if dimensional information on the flameproof joints is necessary.

9.3.2 Net Safety Air Particle Monitor sensor

Ex db op is IIB+H₂ T4 Gb

-40 °C ≤ Ta ≤ +75 °C

IP65

Certificate Number: IECEx SIR 17.0061X

IEC 60079-0:2011, 6th Edition

IEC 60079-1:2014, 7th Edition

IEC 60079-28:2015, 2nd Edition

9.3.3 Junction box (Model JB-MPD)

Ex d IIB+H₂ T5 Gb

-55 °C ≤ Ta ≤ +85 °C

IP67

Certificate Number: IECEx FMG 14.0009X

IEC 60079-0:2011/IEC 60079-1:2007

Consult the manufacturer if dimensional information on the flameproof joints is necessary.

Follow the manufacturer's instructions to reduce the potential of an electrostatic charging hazard.

10 Ordering information

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Option	Description	
MLP-AR-APM	Net Safety™ Air Particle Monitor	★
Output		
-OP-SEP	Analog, relays	★
Housing style		
-SS	Stainless steel	★
Product certifications		
	CSA	★
-X	ATEX flameproof	★

Note

Emerson Automation Solutions

6021 Innovation Blvd

Shakopee, MN 55379

Toll Free +1 866 347 3427

F +1 952 949 7001

Emerson.com/FlameGasDetection

GLOBAL HEADQUARTERS

Emerson Automation Solutions
Rosemount
6021 Innovation Blvd.
Shakopee, MN 55379

 Toll Free +1 866 347 3427

 +1 952 949 7001

 safety.csc@emerson.com

EUROPE

Emerson Automation Solutions
Neuhofstrasse 19a P.O. Box 1046
CH-6340 Baar
Switzerland
 +41 (0) 41 768 6111
 +41 (0) 41 768 6300
 safety.csc@emerson.com

MIDDLE EAST AND AFRICA

Emerson Automation Solutions
Emerson FZE
Jebel Ali Free Zone
Dubai, United Arab Emirates, P.O. Box 17033
 +971 4 811 8100
 +971 4 886 5465
 safety.csc@emerson.com

ASIA-PACIFIC

Emerson Automation Solutions
Asia Pacific Private Limited
1 Pandan Crescent
Singapore 128461
Singapore
 +65 777 8211
 +65 777 0947
 safety.csc@emerson.com

-  [Linkedin.com/company/Emerson-Automation-Solutions](https://www.linkedin.com/company/emerson-automation-solutions)
-  twitter.com/rosemount_news
-  Facebook.com/Rosemount
-  youtube.com/RosemountMeasurement

©2019 Emerson. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. Net Safety is a mark of one of the Emerson family of companies. All other marks are the property of their respective owners.