

BULLETIN 724A

INSTALLATION & OPERATION

DustAlarm® Broken Bag Detector



Thank you for purchasing a quality product manufactured by Monitor Technologies LLC. We realize that you do have a choice of vendors when procuring broken bag detectors and we sincerely appreciate your business!



This manual contains the information necessary to ensure a safe and successful installation. Please read and comply with the section on page 10 of this manual pertaining to SAFETY. Doing so will ensure proper operation of the equipment and the safety of all personnel.



Before discarding shipping container, please inspect it thoroughly and verify that all parts ordered are accounted for. Sometimes smaller parts become stuck under carton flaps and other packaging materials.

In the event that information contained herein does not completely satisfy your requirements or answer your questions, you may contact Technical Support on our website www.monitortech.com, by telephone at 800-766-6486 (630-365-9403), or by fax at 630-365-5646. If your **DustAlarm®** ever requires service either in or out of warranty, please contact us and obtain an RMA number prior to shipping the unit to us.



www.monitortech.com

The **DustAlarm**[®] Broken Bag Detector provides reliable and economical detection of leaks and filter failures in many powder and bulk solids industries. The **DustAlarm** is successfully utilized in a wide variety of applications where detection of dust levels is critical either to safety, maintenance, equipment operation, plant efficiency and/or the environment. Utilizing proven technology, the **DustAlarm** measures the triboelectric effect to determine when particle emissions exceed acceptable levels. Triboelectric measurement, characterized by simplicity and over 20 years of technical refinement, results in superb application reliability.

The **DustAlarm** Broken Bag Detector incorporates visual indications and a relay output to maximize its user-friendliness and automation capabilities. Multi-colored Signal LED provides for easy set up. LEDs are also provided to indicate the alarm condition when the housing cover is removed. A reference point is set by the sensitivity control adjustment, aided by the tri-color LED. The alarm point is set by an alarm level control adjustment. The relay output status is indicated by an alarm LED. The relay output can be used to activate an alarm device or can be integrated into a control system to enhance the overall operation of the dust collector.

PRINCIPLE OF OPERATION

Triboelectric measurement, which has been used for broken bag detection for many years, is based on the triboelectric effect. Also known as particle impingement or frictional electrification, the triboelectric effect pertains to the resulting charge transfer when one material rubs or impacts another.

Triboelectric measurement systems are designed to directly measure dust concentration in an exhaust duct. The result of dust particle collision with a stainless steel probe is the generation of electrical signals, which are continuously monitored and analyzed by the **DustAlarm**[®] Broken Bag Detector electronics. When the electrical signal exceeds a preset level, adjustable from 1 to 10 times greater than the normal background (base line) signal, a time delay is initiated. If the signal remains above the preset level for the duration of the delay, an alarm relay is energized. The two (2) sets of SPDT relay contacts are isolated from each other and can be used to initiate alarms or other functions. Setup of the **DustAlarm** is guided by a tri-color LED and two single-color LEDs, that continuously indicate signal and alarm status.

PRE-INSTALLATION CONSIDERATIONS

Specified Probe Length:

Be sure the probe length has been specified so that the **DustAlarm**[®] purchased has a probe length such that it will reach the center of the duct or beyond, but not make contact with the opposite wall. The standard **DustAlarm** probe lengths are 3 inches, 6 inches, and 12 inches. If required, the probe may be cut down to the proper length for the application (See Figure 1). The minimum length is 3 inches (76 mm). Please consult the factory if probe lengths less than 3 inches (76 mm) or greater than 12 inches (305 mm) are required.

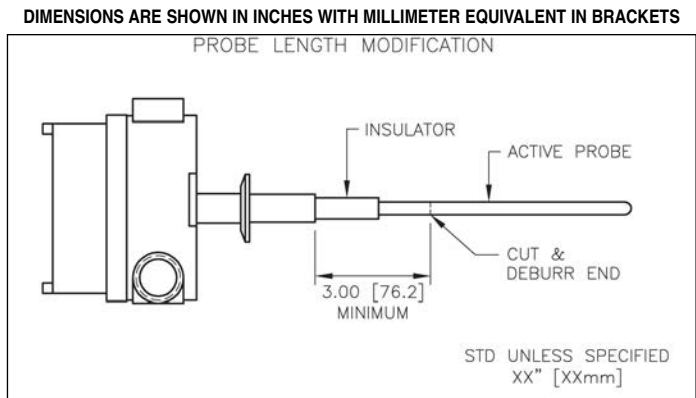


Figure 1

Choosing a Location:

The **DustAlarm** should be mounted directly on the outlet duct of the filter baghouse or dust collector system (See Figure 2). The preferred installation site is on a length of straight duct, approximately five duct diameters from any obstructions (i.e. elbows, reducing fittings, etc.). For horizontal ducts, the unit should not be installed at the bottom, to avoid unnecessary build up of particles around the probe. Please consult the factory if bridging between the active probe element and duct wall by conductive solids will occur.

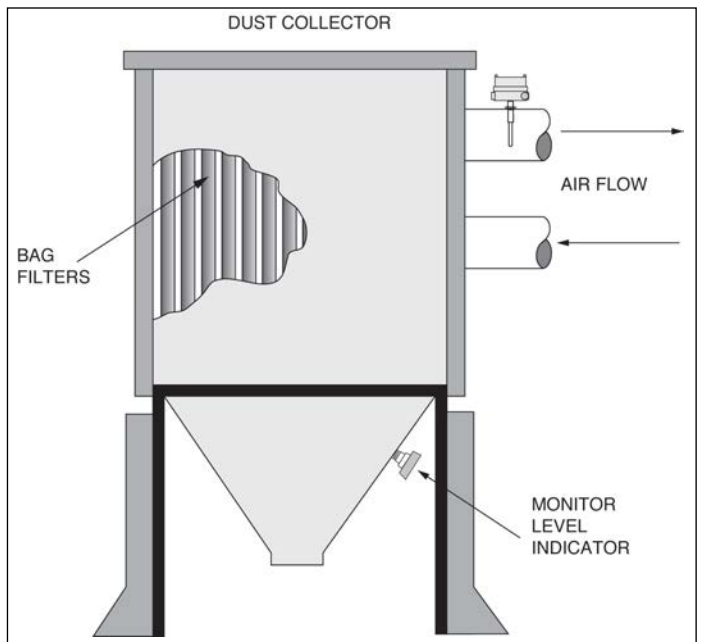


Figure 2

The **DustAlarm** is designed to be mounted in a metallic duct or pipe. Mounting will be accomplished using the quick-disconnect ferrule, gasket and clamp provided with the unit. For details see "Mechanical Installation". When selecting the mounting location for the **DustAlarm**, the following points should be observed:

- 1) **Accessibility** - The mounting location should be accessible for maintenance and the controls should be visible to the installer/operator when the cover is removed.
- 2) **Vibration** - The unit is designed for use in conjunction with baghouse and dust collector systems. As such it is provided with a rugged cast aluminum enclosure. However, care should be taken to protect the unit from excessive vibration, which can cause physical damage to the electrical circuit boards and connections.

- 3) **Temperature Limits** - The operational temperature limits must be satisfied to ensure reliable operation (See Specifications).
- 4) **Location** - The unit must be located downstream from particulate control equipment, and free from vibration. Typically before the blower is a good location because there is usually a straight section of duct present and very little vibration.
- 5) **Upstream/Downstream Requirements** - The preferred installation site is at least three duct diameters away from any obstructions. However, the location of the **DustAlarm** must be preceded by an unobstructed straight section of duct of at least two pipe/duct diameters in length, and followed by an unobstructed straight section of at least one pipe/duct diameter. If the duct is rectangular, use the diagonal dimension to determine the required straight section length.
- 6) **Other Location Considerations** - The location should be a sufficient distance from the stack exit so that outside atmospheric conditions will not affect the sensor. For example, heavy rain may cause a false signal if the sensor is located in a vertical stack.

- 2) **Heavy Dusting** - If a heavy dust loading is present, the unit must be installed in a section of metallic pipe or duct. This section should extend as far up stream as possible, two diameters downstream, and must be connected to a good earth ground. **NOTE:** The **DustAlarm** mounting must be provided with a local earth ground, either through the ductwork and **DustAlarm** mounting or by a separate means connected to the mounting. The safety (protective earth) ground is provided through the electrical power supply connection.

Test Port:

For negative pressure systems, to aid in troubleshooting, it is recommended that a test port be installed upstream, approximately 2 duct diameters from the probe, on the same side of the duct. A plugged half coupling is sufficient.

Failure to correctly install the **DustAlarm** may prevent the unit from operating reliably; therefore, any modifications to these procedures should be discussed with the factory.

MECHANICAL INSTALLATION

The **DustAlarm**® is furnished with a quick-disconnect ferrule, gasket and clamp for easy installation and maintenance of the probe. To mount the **DustAlarm**, disassemble the ferrule, gasket and clamp. Make sure the gasket is removed from the ferrule before it is welded to the duct. Weld the quick-disconnect ferrule to the duct or pipe at the chosen mounting point. When the **DustAlarm** is installed, the insulator should not be recessed from the inner wall but should protrude into the flow stream (See Figure 3).

DIMENSIONS ARE SHOWN IN INCHES WITH MILLIMETER EQUIVALENT IN BRACKETS

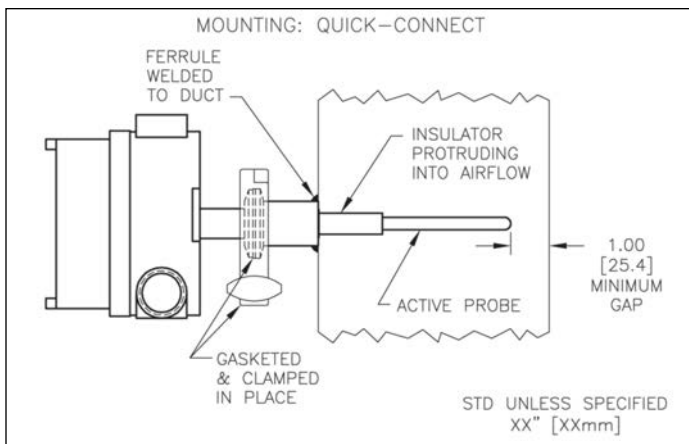


Figure 3

Non-Metallic Ducts:

If the **DustAlarm** is to be mounted in a non-metallic pipe or duct, the following special precautions must be taken to prevent the detection of stray electric fields:

- 1) **Light Dusting** - If the unit is to be installed after a dust collector where only a light dust loading is present, an electrostatic (Faraday) shield must surround the pipe or duct for three diameters both up and down stream. The shield must make contact with the external ground screw on the **DustAlarm** and a good earth ground. Hardware cloth, screen material or rabbit wire all make an adequate shield.

ELECTRICAL INSTALLATION

- 1) **Ordinary Locations Only** - The **DustAlarm**® is suitable for installation in general purpose Ordinary locations only. (For optional Remote Electronics see next section on Pages 5 - 7.)
- 2) **Factory Wiring** - Do not alter any factory wiring within the unit. Wire only to the terminal connections within the enclosure.
- 3) **Permanently Connected Equipment** - Disconnecting devices shall be included in the system installation. In installations where multiple circuits are used, individual disconnects are required. The disconnects shall be within close proximity of the equipment, accessible to operators, and marked appropriately as the disconnect for the associated circuit. Assure the disconnect ratings are appropriately sized for the circuit protected (See Specifications).
- 4) **Circuit Separation** - Two cable/conduit entry locations are provided to aid in maintaining separation of "hazardous live" (typical mains voltages such as 115VAC or 230VAC) and limited circuits (typically control voltages less than 30Vrms or 42.5VDC). It is required that all wiring used must have an insulation rating of 300v minimum, and a temperature rating of 221°F (105°C) minimum.
- 5) **Protective Earthing** - Each **DustAlarm** Broken Bag Detector is provided with a "protective conductor terminal" ⊕ which shall be terminated to the local earth ground potential to eliminate shock hazard. Select wire size that can carry in excess of the sum of all circuit's maximum amperage.
- 6) **Access to Terminal Connections** (See Figure 4) - Remove the screw-on cover of the **DustAlarm** unit and then the four screws (marked "for access") which hold the top board assembly in place. Unplug the inter-board cable from the back of the top board assembly and set the board aside. Electrostatic discharge (ESD) precautions should be implemented when handling PCB so it is not damaged during this process. There are two plug-in terminal blocks located on the bottom board assembly. The 2-position block [marked "L" (line) and "N" (neutral) on the circuit board] is for the power input and the 3-position block (marked "NC", "C" and "NO" on the circuit board) is for the relay contact set.

- 7) **Power Input** - Verify the intended voltage supply is compatible with the voltage configuration indicated on the external nameplate. Remove the plug-in terminal blocks and connect the power wiring as shown in Figure 5. The customer supplied power cable must have a minimum conductor size of 1mm² (18 awg). Additionally, the customer is responsible for installing a main power disconnect as mentioned above.
- 8) **Relay Output Contacts** - The **DustAlarm** is shipped in a FAIL-SAFE mode (See Figure 5b). That is, the relays are energized when power is applied and de-energized in the alarm mode. The SPDT (form C) relay contact is electrically isolated from all other parts of the unit. The contact is rated at 5A, 250VAC, 30VDC. Remove the plug-in terminal block and connect relay contact wiring as shown in Figure 5.
- 9) **Re-assembly** - Plug in the terminal blocks, insuring that power and relay output leads are kept well separated. Reconnect the inter-board cable to the back of the top board assembly. There are two interchangeable connectors for the cable; either may be used so that the display will be in the proper orientation. Secure the board in place with the four screws. Replace the enclosure cover to protect the electronics from damage, unless you are ready to proceed with setup of the **DustAlarm** Broken Bag Detector at this time.

- 10) **DC Power Option** – The **DustAlarm** Broken Bag Detector may be supplied to operate with a DC input voltage between 10 and 32 volts (nominal 12V and 24V systems). If you have purchased a unit with this supply selection, the following conditions must be observed: The positive power input must be connected to the position labeled “L” on the unit’s power terminal block. Connect ground (-) to the “N” position on the power terminal block. Refer to Figure 5 for the proper wiring procedure. Input voltages above 32 VDC should never be applied at the power terminal block. To protect the unit, voltages much higher than 32 VDC will blow the fuse. Since the unit needs to draw sufficient power to operate, the lower the input voltage, the higher the current requirement. Operating the unit with an input less than 10 VDC could draw sufficient current to blow the fuse. To prevent blowing the fuse, the DC powered unit is equipped with an under-voltage lockout feature that will shut the unit down if the input voltage drops much below 10 VDC. Refer to the table below to determine the average power and current requirement of your **DustAlarm** unit, and the correct fuse. Consult the factory before attempting to replace the fuse. **WARNING:** Never apply AC power to any unit equipped with the DC power supply selection.

Power	Current @ 10V	Current @ 14V	Current @ 28V	Current @ 32V	Fuse
5.6W	560mA	390mA	180mA	70mA	1A slo-blo

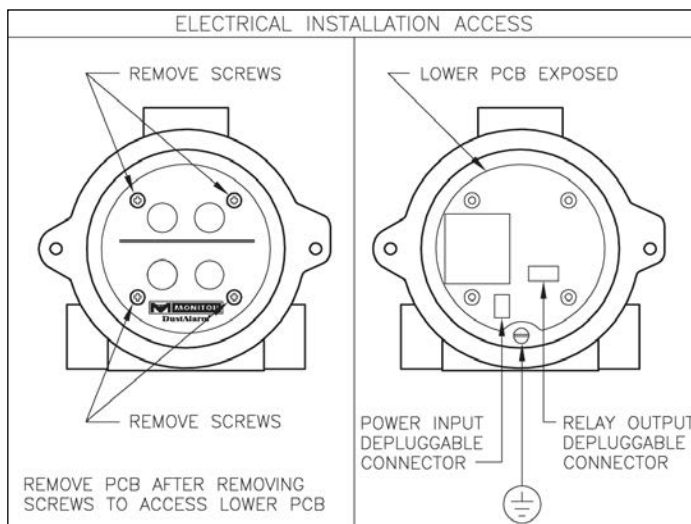


Figure 4

INSTALLATION - OPTIONAL REMOTE PROBE/ELECTRONICS

Follow the instructions and guidelines for mechanical and electrical installation as previously outlined. Placement of the active probe assembly and the electronics housing must be close enough to allow the interconnecting cable assembly to be installed in a neat and secure fashion using proper strain relief techniques. See figures 6 and 7 for instructions on the cable assembly. Setup and calibration procedures that appear later in this manual apply to both the integral probe design and the split architecture (remote electronics) design.

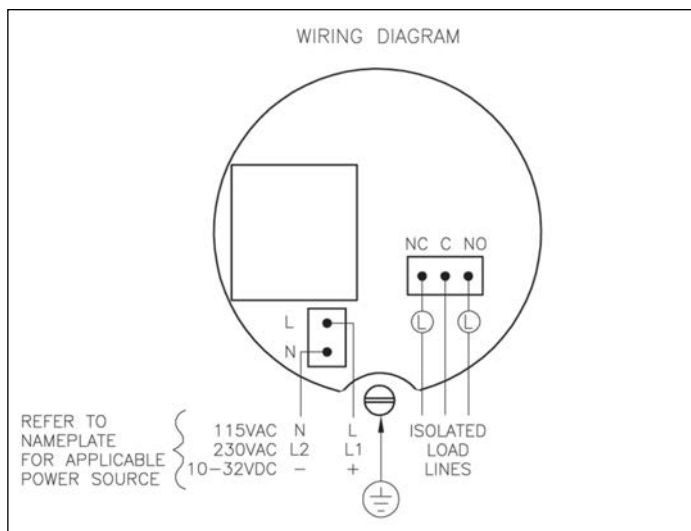


Figure 5

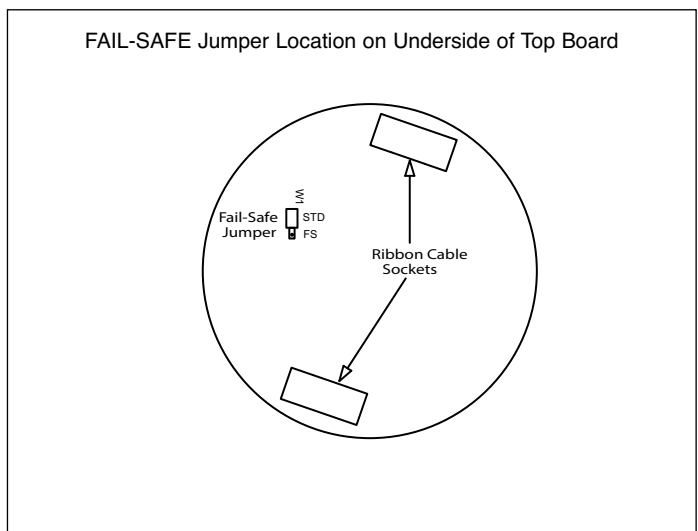
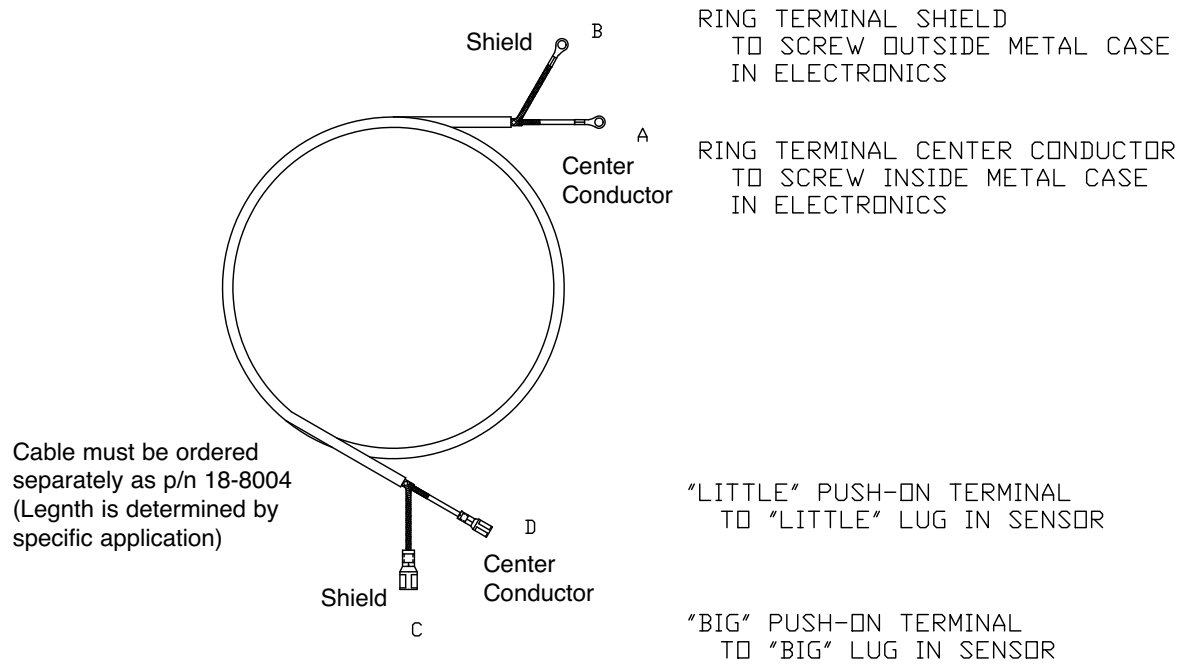


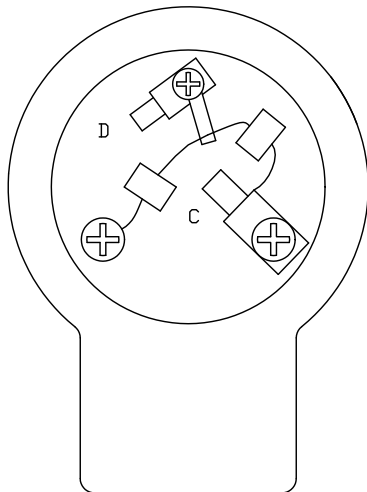
Figure 5b

CABLE ASSEMBLY FOR OPTIONAL REMOTE PROBE/ELECTRONICS



Cable must be ordered separately as p/n 18-8004 (Length is determined by specific application)

SENSOR



ELECTRONICS

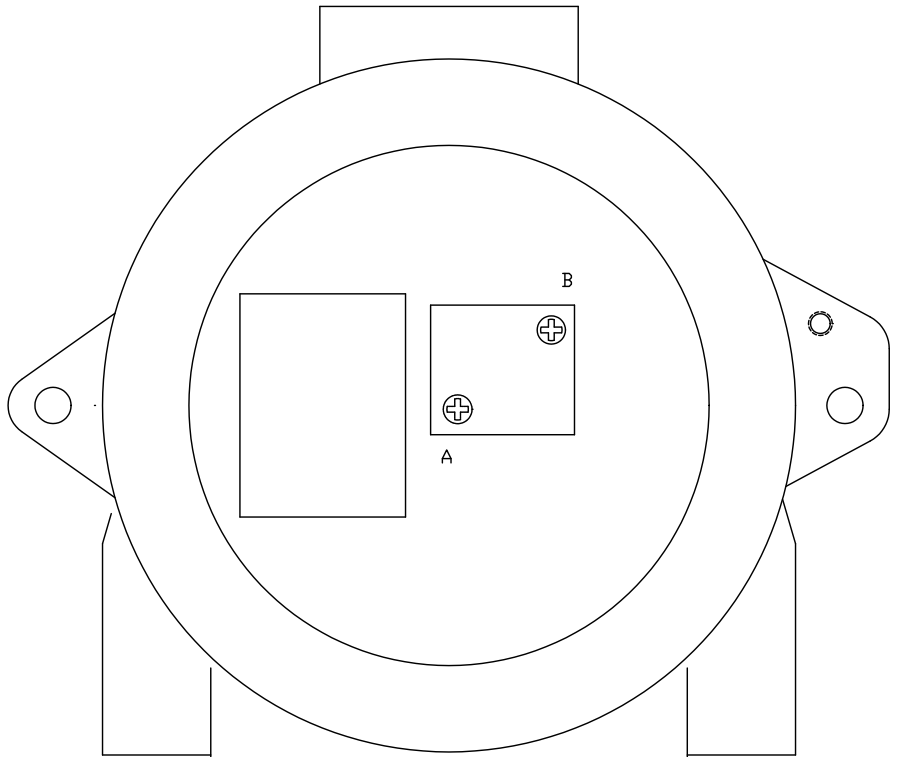


Figure 6

**CABLE ASSEMBLY IS UNIQUE.
THESE INSTRUCTIONS AND THE ELECTRICAL
TESTING PROCEDURE MUST BE FOLLOWED TO
ENSURE PROPER OPERATION.**

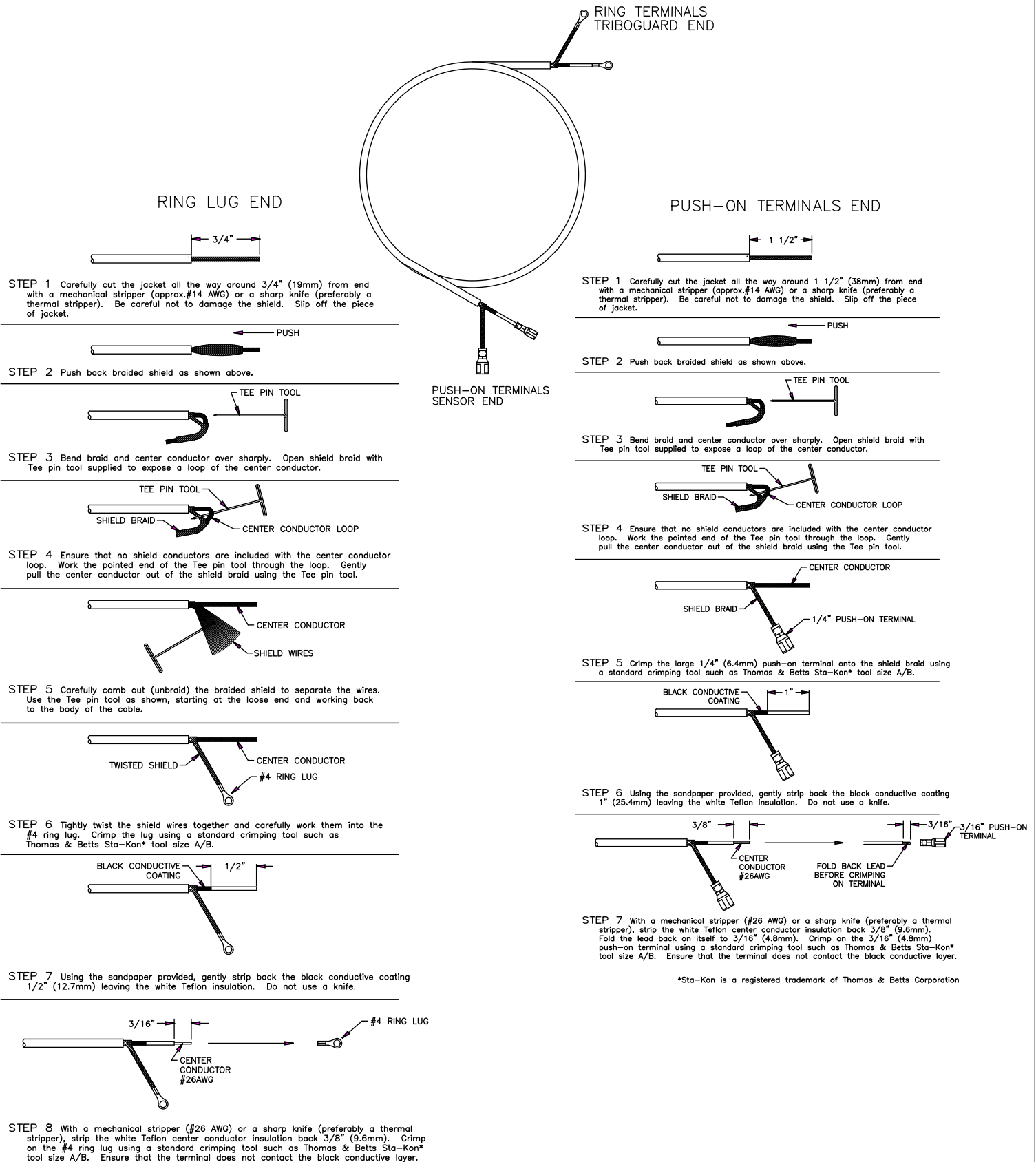


Figure 7

SETUP

Remove the enclosure cover of the **DustAlarm**[®] unit and note the controls and indicators on the label covering the top board assembly (See Figure 6). The following is a brief description of each:

1) Sensitivity Adjustment - The tri-color Signal LED guides the operator when setting the SENS control and the X1-X10 switch. When the sensitivity is too low the LED indicator is yellow, when it is too high it is red and when it is okay it is green. The Signal (SIG) LED also functions as a power on indicator since it is always illuminated when power is applied and the unit is functioning. The SENS (sensitivity) control has a linear range of 1 to 10 and is used to adjust the triboelectric signal level as indicated by the tri-color Signal LED. The X1 - X10 switch multiplies the range of the SENS control by a factor of ten, when it is placed in the X10 position.

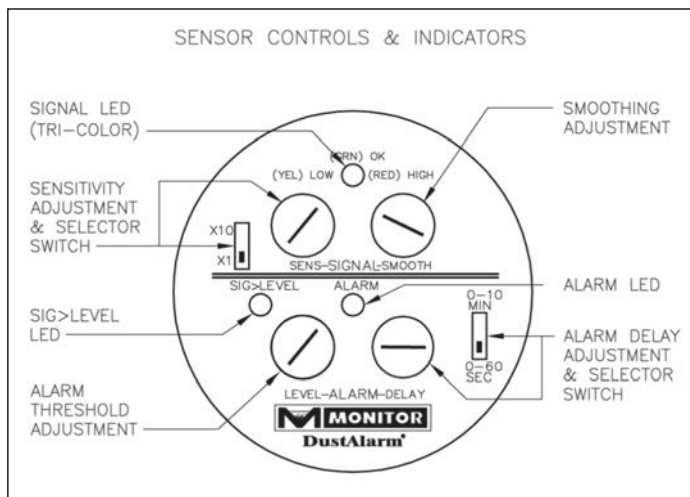


Figure 8

2) Smoothing Adjustment - The SMOOTH control provides adjustable smoothing of the triboelectric signal before it is displayed by the tri-color LED. It has a time constant range of 0.1 to 22 seconds.

3) Alarm Threshold Adjustment - The ALARM LEVEL control provides an adjustable threshold of 1 to 10 times the base line (green signal LED) signal level. When the signal exceeds the alarm threshold the yellow SIG > LEVEL LED illuminates and the alarm delay is initiated.

4) Alarm Delay Adjustment - The ALARM DELAY control has two switch selectable ranges of 0 to 60 sec (seconds) and 0 to 10 min (minutes). It delays operation of the output relay contact sets until the signal (SIG) has remained above the alarm threshold for the delay period. If the signal falls below the alarm threshold level the delay is reset.

5) Alarm Indication - The ALARM LED illuminates when the signal (SIG) remains above the alarm level setting for the delay period and remains on until the signal drops below the alarm level. The output relay contact sets change from their normal (relay energized is normal) state whenever the red ALARM LED is on.

Initial Set-Up Procedure:

- 1) Remove the enclosure cover for access to the controls and indicators.
- 2) Set the controls of the **DustAlarm** as follows:

- a) X1-X10 switch to X10
- b) SENS control to 10
- c) SMOOTH control to 0.1 seconds
- d) ALARM LEVEL control to 2
- e) ALARM DELAY control and switch to 10 sec

3) Ensure that power is applied to the unit and the SIGNAL LED is illuminated.

Calibration:

1) Ensure that power and relay contacts are properly connected.

2) Ensure that normal emissions are flowing over the probe.

NOTE: No signal will be indicated unless particles impact the probe.

3) Ensure that the following conditions exist prior to making the sensitivity and smoothing adjustments

a) Upstream processes are functioning normally and the dust collector is collecting dust.

b) Dust collector cleaning systems, such as pulse jet, rapper or shaker cycles are also functioning properly since they will cause momentary increases in dust emissions.

4) Adjust the SENS control and the X1-X10 range switch to achieve approximately a 10% of full range signal, as indicated by the Signal (SIG) LED illuminating (green) OK between normal cleaning pulses. **NOTE:** The Signal (SIG) LED will always be illuminated, however, it will be one of three colors: yellow, green or red. The SENS control and the X1-X10 range switch should be:

a) Increased if it is (yellow) LOW (0 to 7.5% of full range)

b) Decreased if it is (red) HIGH (12.5 to > 100% of full range)

c) Left as is if it is (green) OK (7.5 to 12.5% of full range)

5) Initially, the triboelectric signal may cause the tri-color Signal (SIG) LED to flash rapidly through all colors making it difficult to observe. Increase the SMOOTH control setting slowly until the LED is easily observed.

6) If required, readjust the SENS and SMOOTH controls so that the base line signal between cleaning pulses indicates (green) OK and normal cleaning pulses are indicated by short duration changes to (red) of the Signal (SIG) LED.

7) The SENS control should be adjusted finally, so that normal cleaning pulses just cause the yellow SIG > LEVEL LED to blink, with the ALARM LEVEL control set to 2. **NOTE:** It is helpful to observe the Signal (SIG) LED through several cleaning cycles to ensure that the adjustments have been based on normal cleaning pulses. An extremely large or sustained pulse indicates a leaking bag or filter element. The **DustAlarm** Broken Bag Detector is now calibrated (Signal controls adjusted; SENS, X1-X10 switch and SMOOTH) for your application. The adjustment of the Alarm controls (LEVEL and DELAY) must be set also, using one of the two procedures as shown under Alarm Operation.

Alarm Operation:

Each baghouse or dust collector has its own unique operating characteristics. The **DustAlarm** alarm controls must be tuned to these characteristics. There are two basic operating techniques; Early Warning and Average Emissions. Use the technique that best fits the needs of your application.

1) **Early Warning** - This technique monitors the magnitude and duration of emissions following each cleaning pulse. This technique can often detect a leaking bag or compartment before it contributes significantly to the overall emission rate,

thus enhancing pro-active maintenance.

- a) Observe the Signal (SIG) LED through several cleaning cycles to determine the period of the longest normal cleaning pulse.
 - b) Set the ALARM LEVEL control between 5 and 8.
 - c) Set the ALARM DELAY control equal to the period of the longest normal cleaning pulse observed in Step 1 above.
- 2) Average Emissions** - This technique monitors the average base line emission rate as a measure of overall leakage rate from the filter. This technique is used when cleaning cycles occur infrequently or as required by other operating conditions.
- a) Set the ALARM LEVEL control between 2 and 5, as determined by the maximum allowable emission rate, relative to the normal base line emission rate. NOTE: The actual normal base line emission rate must be determined by a parallel gravimetric test, such as EPA Method 5 or 17, to quantify the true ALARM LEVEL setting.
 - b) Set the ALARM DELAY control for a period equal to a complete cleaning cycle, or at least longer than the longest cleaning pulse. If possible, a small amount of dust should be injected into the duct upstream of the sensor to check for proper operation. The magnitude of the cleaning pulse emissions usually far exceeds the average base line emissions, however, they are of very short duration. An increase in the overall leakage rate of the collector, or a catastrophic bag failure will cause the base line signal to increase and remain high for an extended period.

TROUBLESHOOTING

PROBLEM: The DustAlarm® Broken Bag Detector is totally inoperative and the Signal (SIG) LED is off.

CAUSE/SOLUTION:

- 1) Check for line voltage between “L1” and “N” terminals (See wiring diagram).
- 2) If no voltage is present, re-establish power to the unit.
- 3) If voltage is present, consult the factory.

PROBLEM: A constant high Signal is indicated [Signal (SIG) LED is red and SIG > LEVEL LED is illuminated as well] with no flow across the DustAlarm probe.

CAUSE/SOLUTION:

- 1) Ensure that solids are not packing or bridging the probe (See Maintenance section for probe cleaning procedure).
- 2) Ensure that the probe’s insulator is not recessed (See Figure 3).
- 3) Ensure that a major filter failure has not occurred.
- 4) See Maintenance section for procedure on isolating false signals.

PROBLEM: Unit does not respond to flow variation.

CAUSE/SOLUTION:

- 1) See “Initial Set-up” and “Calibration” sections, as well as “Zero Check Procedure in the Maintenance section.
- 2) Consult the factory if there is still no response.

PROBLEM: Red Alarm LED remains energized with SIG > LEVEL LED off.

CAUSE/SOLUTION:

- 1) Consult the factory.

MAINTENANCE

Routine Maintenance Program:

A routine maintenance program should be established for the **DustAlarm®** Broken Bag Detector using the following guidelines:

- 1) The electronics should be zeroed once a year by following the Zero Adjustment Procedure.
- 2) A system zero check should be performed at least once per year. This procedure is to ensure that noise sources have not been introduced so that any signal observed during normal operation is due to the flow conditions of the process.
- 3) The sensor probe and insulator should be checked periodically after installation to determine if, and at what intervals, cleaning is required. When monitoring a dust collector, the sensor should also be checked after a major filter break or other major process upset. The conditions to look for when inspecting the probe are:
 - a) Build-up of material on the probe - Cleaning intervals should be such that a heavy build-up of material is not permitted to form on the leading edge of the probe. Build-up on the trailing edge is not a concern.
 - b) Wet materials - Condensed liquids or conductive materials should not be permitted to build around the insulator. If these conditions are inherent in your process, please consult the factory to ensure you have the proper probe configuration.
- 4) **Functional check** - If the process and conditions permit, it is recommended that a test port be installed (See Mechanical Installation) upstream of the probe. This port can be used to simulate a deficiency in the dust collector system by introducing a small amount of dry powder into the process (i.e. talcum powder). The Signal (SIG) LED of the **DustAlarm** unit will respond to the onset of the powder. If the injection is of adequate magnitude and is sustained long enough, the yellow SIG > LEVEL LED and the red ALARM LED will illuminate. If possible, the material induced should be the same as or similar to the material being monitored. **Caution:** The functional check procedure cannot be used as a reliable technique for calibrating the **DustAlarm** Broken Bag Detector because the feed rate and the distribution of the powder within the duct is too uncertain.
- 5) If apparently false signals are detected, see the System False Signal Isolation procedure within this section.

Zero Adjustment Procedure:

- 1) Remove the four (4) screws holding the top board assembly in place and turn the assembly partially over to the right so that the test points on the back of the assembly are visible. Do not unplug the ribbon cable that connects the top and bottom boards.
- 2) All signals from the sensor must be eliminated before zeroing can be accomplished. Remove the **DustAlarm** from the duct and place it in a Faraday shield.
- 3) Connect a DVM (digital voltmeter) set for DC volts between the test points TP3 (COM) and TP1 (ZER).
- 4) If the unit has been in normal service, record the SENS control and X1 – X10 switch settings.
- 5) Adjust the sensitivity to maximum by turning the SENS control fully clockwise to the 10 position, and by placing the X1 – X10 switch to the X10 position.

- 6) Adjust the ZERO control (25 turn control without end stops) on the bottom board assembly, for 0 +/- 0.002 Volts DC.
- 7) Return the **DustAlarm** to its original configuration and control settings. Reinstall the top board assembly.

False Signal Isolation Procedures:

- 1) **System-Level False Signal Check** - This check allows verification that the system is noise-free and thus any output signal observed during normal operation is due solely to particle impaction on the sensor probe. Ensure that no particles are impinging on the probe by:
 - a) Creating a zero flow condition in the duct, or
 - b) Removing the sensor probe from the duct and inserting it into a Faraday shield (metal tube surrounding, but not contacting, the sensor probe and grounded to the sensor body and the original sensor mounting).
 - c) If the unit has been in normal service, record the SENS control and X1 – X10 switch settings.
 - d) Adjust the sensitivity to maximum by turning the SENS control fully clockwise to the 10 position, and by placing the X1 – X10 switch in the X10 position.
 - e) Remove the four (4) screws holding the top board assembly and turn it partially over to the right so that the test points on the back are visible. Do not unplug the inter-board cable.
 - f) Connect a DVM (digital voltmeter) between test points TP3 (COM) and TP2 (SIG).
 - g) Observe the DVM reading. If a signal greater than 0.2V is present, the instrument is detecting noise (false signal) from either the sensor or electronics. If so, follow the isolation procedures below to determine the source. If the meter reads less than 0.2V, any readings during the normal operation are due to particle impactions on the probe.

2) False Signal Isolation

- a) Connect a DVM as described in step c. through f. in the previous section on System-Level False Signal Check.
- b) Ensure that there is absolutely no flow in the duct, or the unit must be placed in a Faraday shield which is grounded. If the DVM reading does not read 0.2V or less, there is a false signal from the sensor. The next step is to clean the probe, especially the insulator, with a clean dry rag; do not use liquids. Then re-install the probe in the duct or the Faraday shield. If the DVM now reads 0.2V or less, the sensor was fouled by a build-up of conductive material over the insulator. If cleaning did not change the signal, check for conductivity across the small, round OVP component in the base of the **DustAlarm** unit. If any conductivity is indicated, the OVP should be replaced. Consult the factory for assistance. **NOTE:** To gain access to the OVP, the bottom board assembly must be removed. This is accomplished by unplugging the power and output terminal blocks, removing the four (4) tall standoffs and grasping the transformer, to withdraw the assembly. If the OVP is an open circuit and the cleaning did not change the false signal, contact the factory for assistance.
- c) If the DVM reading did not drop to 0.2V or less in step b, the electronics is creating a false signal. Check the electronic zeroing as described in the Zero Adjustment Procedure. If the false signal cannot be eliminated, contact the factory for assistance.

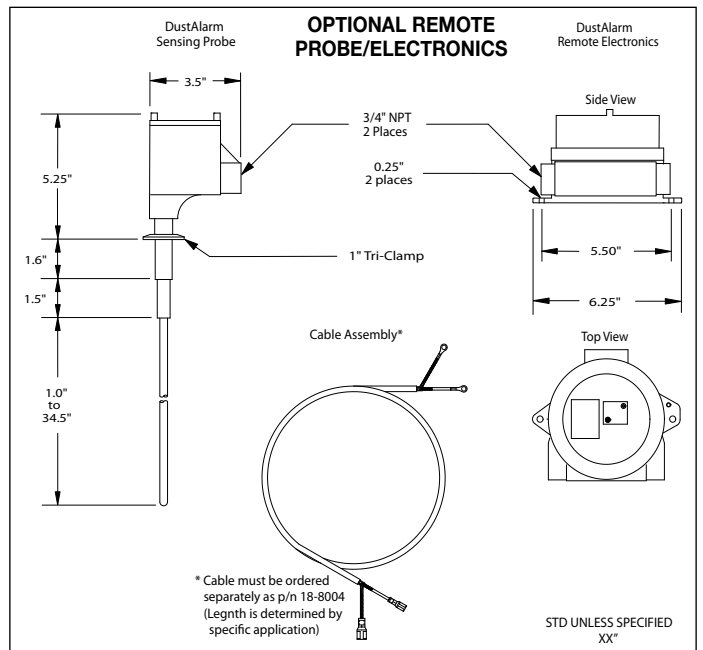
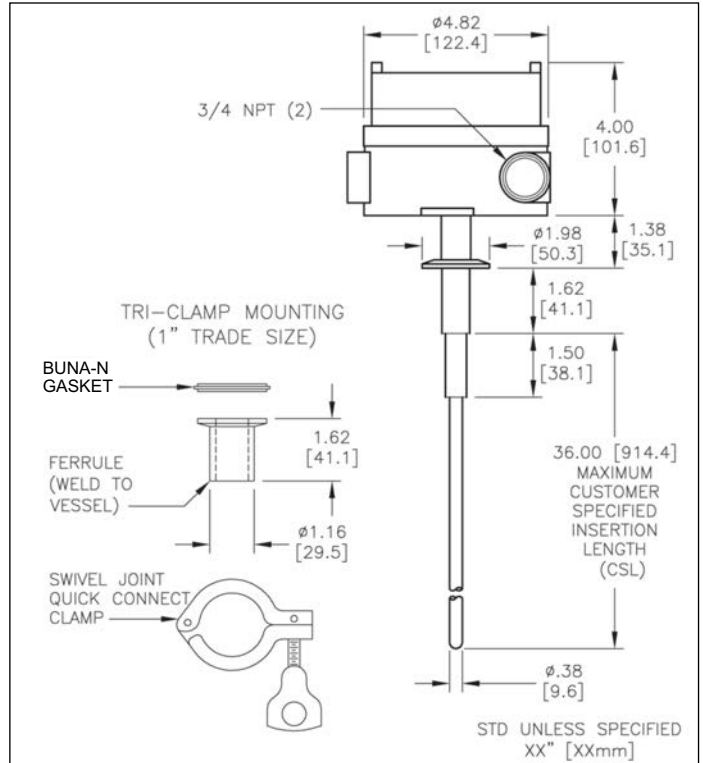
Probe Cleaning Procedure:

- 1) Clean the sensor probe, especially the insulator, with a clean dry rag; do not use liquids – install the sensor in the duct or the Faraday shield. If the Signal (SIG) LED is yellow, the sensor was fouled by a build-up of conductive material over the insulator.
- 2) If cleaning did not eliminate the false signal, consult the factory for assistance.

If the preceding information and procedures contained within the Troubleshooting and Maintenance sections do not prove sufficient, contact the factory.

MECHANICALS

DIMENSIONS ARE SHOWN IN INCHES WITH MILLIMETER EQUIVALENT IN BRACKETS



BULLETIN 724A

WARRANTY

Monitor Technologies LLC warrants each **DustAlarm**® Broken Bag Detector it manufactures to be free from defects in material and workmanship under normal use and service within two (2) years from the date of purchase. The purchaser must give notice of a defect to Monitor Technologies LLC within the warranty period, return the product intact and prepay transportation charges. The obligation of Monitor Technologies LLC under this warranty is limited to repair or replacement at its factory. This warranty shall not apply to any product which is repaired or altered outside of the Monitor Technologies LLC factory, or which has been subject to misuse, negligence, accident, incorrect wiring by others or improper installation. Monitor Technologies LLC reserves the right to change the design and/or specifications without prior notice.

SAFETY



General Safety

CAUTION: It is essential that all instructions in this manual be followed to ensure proper operation of the equipment and safety of operating personnel. The use of this symbol is used throughout manual to highlight important safety issues. Please pay particular attention to these items.



Electrical Shock Caution:

Certain **DustAlarm**® Broken Bag Detectors are powered with HIGH VOLTAGE. No operator serviceable parts are inside. All servicing is to be performed by qualified personnel. Each **DustAlarm** unit is provided with a "protective conductor terminal" ⊕ which shall be terminated to earth ground potential (See Electrical Installation). This product's design complies with EN61010-1 installation category 1 (230VAC unit), category II (115VAC unit), category III (VDC unit) and pollution degree 2.

Electromagnetic Compatibility (EMC)

The **DustAlarm** Broken Bag Detector was tested and found to comply with the following standards:

FEN50082-1, Electromagnetic Compatibility - General Immunity Standard Part 1. Residential, Commercial and Light Industry

IEC 801-2, Electrostatic Discharge

IEC 801-3, Radiated Electromagnetic Fields

IEC 801-4, Electrical Fast Transient/Burst

IEC 1010-1:1990/EN 61010-1:1993

SPECIFICATIONS

Electronics:

Power Requirements:
Low Voltage AC: 105 to 130 VAC, 50/60Hz
High Voltage AC: 210 to 260 VAC, 50/60 Hz
Low Voltage DC: 10 to 32 VDC
Process Temperature: up to 160° F (70° C);
up to 450° F (235° C) for remote probe/
electronics option
Ambient Temperature: -20° to 150° F (-30° to 65° C)
Output: (1) SPDT isolated relay contact sets;
5 amps @ 250VAC max or 30VDC
Sensitivity Range: 0.0005 grains/dscf (1 mg/m³), typical
detection at maximum sensitivity; 100 to
1 adjustable range
Smoothing: Adjustable from 0.1 to 22 seconds
Sensitivity Setpoint: Baseline level setting indicated by
tri-color LED
Alarm Threshold: Adjustable from 1 to 10 times baseline
Alarm Time Delay: Adjustable range 0 to 60 seconds or 0
to 10 minutes; via range selector and
single-turn control
Fail-Safe: Alarm condition on power failure

Electrical Connections:

(2) 3/4" NPT conduit connection; (2)
cable glands suitable of sealing cords
with diameter of 0.25 in (6.4 mm) to
0.48 in (12.2 mm) are provided
Tri-Color LED indicating: "Low" = Yellow;
"OK" = Green; "High" = Red:
SIG>LEVEL = Yellow:
ALARM LED = Red
Housing: NEMA 4 / ENCLOSURE TYPE 4;
Designed for general purpose locations
1/16" Allen-Wrench

Indicators:

Housing:

Cover Lock:

Probe:

Architecture: Integral or probe with remote electronics
Mounting: Quick-Disconnect fitting with ferrule,
clamp and gasket
Pressure: 30 psi (2 bar) maximum
Insulator Material: PFA, extended length
Probe Material: 3/8" diameter, 316 SS
Probe Length: 3 in (76 mm), 6 in (152 mm), 12 in
(305 mm) standard; consult factory for
custom lengths

Listings/Approvals:

CE mark

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