

EMISSION MONITOR DEPLOYMENT

Introduction

This document details the recommended steps in installing a Triboelectric Emission Monitor to ensure that it performs well. This document and the product manuals are all subject to continuous development, and it is acknowledged that they may contain errors and/or omissions. For the most up-to-date information, including further applications information and case studies, the user should always refer to the supplier, or to the latest issue of CONNECT, whose HELP system will also include this document.

Preparation

Mounting Position

Choose a mounting position which satisfies these criteria:

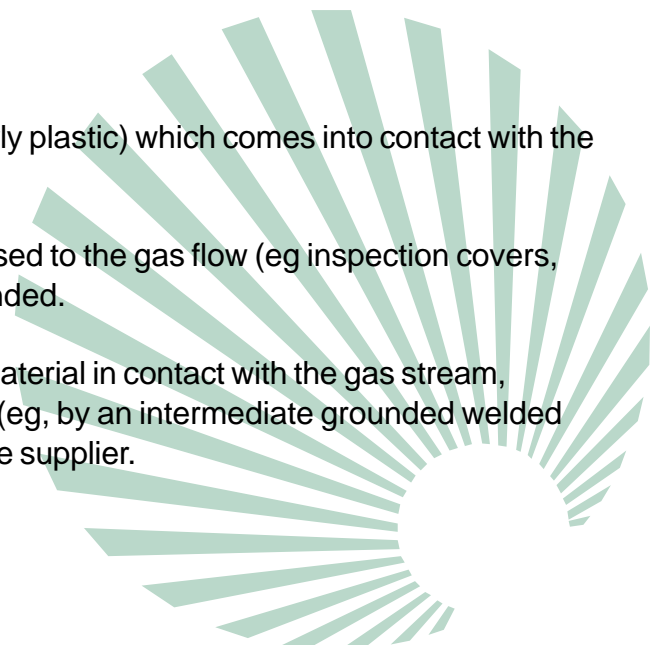
- in a straight section of metal duct,
- at least 5 diameters after or 2 diameters before any bend or screen,
- about 2 diameters before any isokinetic sampling point, at right angles,
- even further from dampers, electrostatic precipitators, wet scrubbers or fans,
- away from high vibration, ambient temperature or direct radiation,
- axis perpendicular to the gas flow,
- axis perpendicular to the plane of the nearest bend (if close).

Grounding Of The Duct Material

If possible, replace any insulating material (particularly plastic) which comes into contact with the gas flow, with grounded metal.

Ensure that every part of the duct and all metal exposed to the gas flow (eg inspection covers, fan and damper blades, isokinetic probes) are grounded.

If there remain any ungrounded metal or insulating material in contact with the gas stream, ensure that it is electrically screened from the probe (eg, by an intermediate grounded welded mesh screen). For any unusual conditions, consult the supplier.



Probe Options

The Emission Monitor is widely adjustable, however probe length also has a significant effect on sensitivity, so choose the probe length according to the following recommendations:

- Below 1mg/m³: 0.8 duct diameters
- Above 100mg/m³: 0.1 duct diameters
- Otherwise: 0.5 duct diameters

The standard probe is stainless steel wire rope, which has a number of advantages:

- The surface texture and small diameter minimise downstream gas flow disturbances to flow transmitters, isokinetic sampling probes, etc,
- The high internal damping eliminates resonance effects which can damage probes and Emission Monitors,
- The inherent sagging minimises the probability of a probe unscrewing itself in operation.

Standard wire rope probes are commonly fitted in one of these forms:

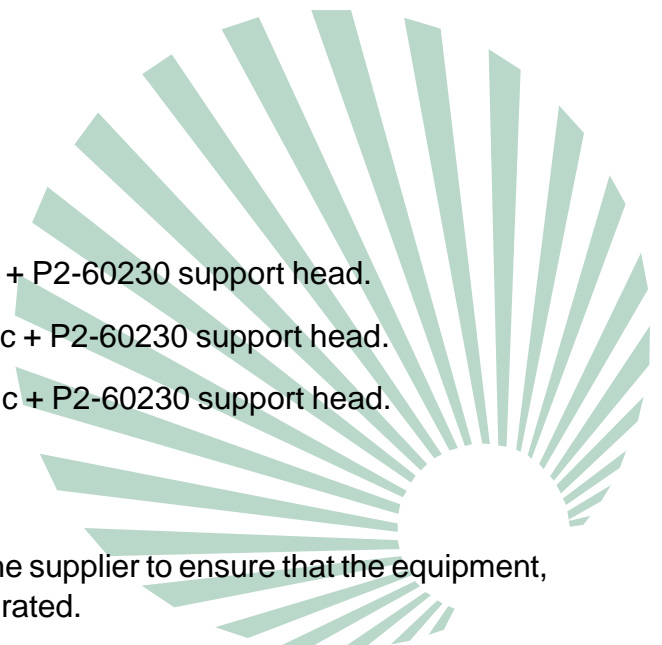
- Cantilevered probe 0-800mm: use a simple wire rope probe alone.
- Probe 800-2000mm total: supported on opposite side by P2-60230 support head.
- Probe above 2000: string the probe across the duct with egg insulators in line at both ends, and strong supports. Add another short section of stainless steel wire to connect the Emission Monitor to the probe.

Alternatively, consult the supplier to discuss other probe options including:

- rigid rod,
- PTFE coated rod,
- rod or rope in wear-resistant material,
- telescopic tubes, as follows:
 - Probe 800-1100mm: use P2-90600 telescopic + P2-60230 support head.
 - Probe 1100-1700mm: use P2-90610 telescopic + P2-60230 support head.
 - Probe 1700-2500mm: use P2-90620 telescopic + P2-60230 support head.

Other Options

If the insertion temperature is over 80C, check with the supplier to ensure that the equipment, accessories and mounting arrangement are suitably rated.



If a quick-release tapping point is required, use either the Bolt-on Mount Kit (P/No. P2-60203, fig 1) or the Weld-on Mount Kit (P/No. P2-60202, fig 2 and fig 4).

Installation

Procedure

Cut a 30mm hole in the duct, and either:

- Weld on a plain 1 inch BSPT female bush, or
- Weld on the Weld-on Mount Kit (P/No. P2-60202, fig 2 and fig 4), or
- Weld on a flange to suit Bolt-on Mount Kit (P/No. P2-60203, fig 1).

If a mount kit is used, screw the Emission Monitor or active head firmly into the thread insert with chamfer outwards (fig 3), insert the assembly through the mounting flange, apply thread sealant to the grub screws and tighten them (fig 5). Otherwise, install the Emission Monitor (firmly hand-tighten) directly in the BSPT bush on the duct.

Wiring

Wiring may only be undertaken by a qualified and licensed practitioner, and must be performed in full accordance with all local regulations. After all connections are made, ensure that the electrical gland is tight to maintain IP ratings.

Remove the lid of the Emission Monitor or Active Head and feed the screened data cable through the lid gland. Clamp the gland onto the cable, lock the outer screen (drain) wire under the lid's internal earth screw if fitted, terminate all cores to the pluggable terminal strip, plug in the terminal strip and replace the lid.

The standard wiring colour code for Networked Emission Monitors is:

White
Green
Screen
Black
Red



The standard wiring colour code for Active Heads is:

Green
White
Screen
Red
Black

Alarms

High Alarms

A basic emission monitoring system will include at least one alarm to indicate that emissions have increased to an unacceptable level. If only one alarm is available, it should be set to about 2 to 3 times the normal running level, or as decreed by the EPA. The alarm delay should be set to at least as long as any normal system disturbances (eg, cleaning pulses from a bag filter), so that the alarm only responds to genuine high emission levels.

Low Alarms

The emission signal can drop below normal because of an obstructed filter or because of particulate buildup across the insulators on the emission monitor. If a Low Alarm is available, it may be set up safely below normal emission levels to warn of these conditions, so that corrective action can be taken.

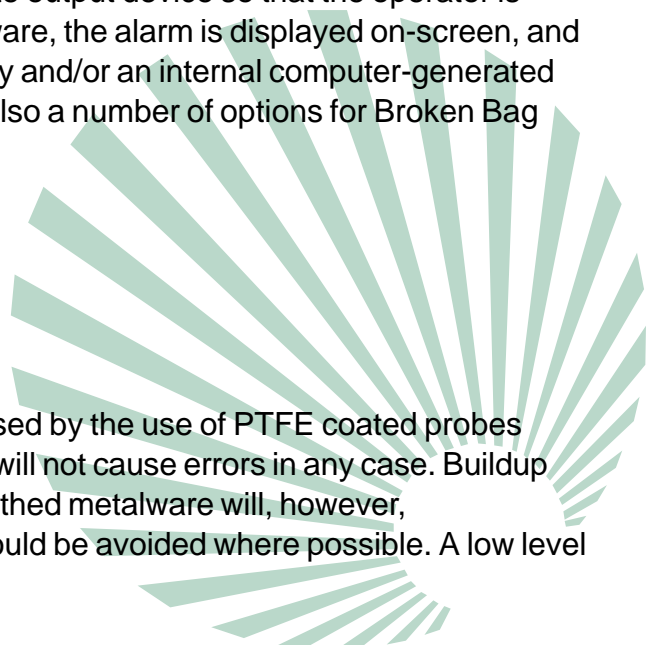
Software Alarms

Software alarms should be directed to the appropriate output device so that the operator is aware of the alarm condition (in the CONNECT software, the alarm is displayed on-screen, and it is usual also to direct each alarm to an external relay and/or an internal computer-generated audible signal). For bag filter installations there are also a number of options for Broken Bag Discrimination.

Purging And Cleaning

Particulate Buildup

Particulate buildup on the probe itself can be minimised by the use of PTFE coated probes (consult the supplier), however buildup on the probe will not cause errors in any case. Buildup across the insulation barrier from the probe to the earthed metalware will, however, progressively attenuate the emission signal, so it should be avoided where possible. A low level alarm can be configured to detect this condition.



Connecting The Purge Air

The purge air port may be connected to a source of clean dry instrument air. If particulate buildup is considered to be a potential problem, then a periodic pulse of purge air (not a continuous bleed) will dislodge recently deposited particles. NEVER exceed the rated pressure of the purge port, or overtighten the air fitting. If not using this facility, the original sealing plug and O-ring must be fitted at all times.

Corrosive Gases

If the gas is corrosive, it should not be allowed to enter the body of the Emission Monitor; normally the purge air path is sealed off in these circumstances by a plug inserted before the probe is screwed in (see the supplier). This is the recommended method. If, however, purge air is required with a corrosive gas, then the purge path cannot be sealed, and a small amount of continuous purge air should be allowed to flow in addition to the pulsed purge air, to prevent the corrosive gas entering the housing.

Periodic Cleaning

Normally, no periodic maintenance is required. If purge air is not used, or in extreme cases even when it is used, it may be desirable to periodically remove, inspect and clean the inserted parts of the Emission Monitor, and also any other insulators if used to support the probe. The period of this maintenance may vary from weekly to annually, depending on the material characteristics.

