



Snifter User Manual

Version 1.3
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Distributor

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1. INTRODUCTION

This manual describes how to install and use SINTROL's triboelectric dust monitor Snifter. Sintrol shall not be liable for any loss or damage whatsoever arising from use of any information or details therein, or omission or error in this manual, or any misuse of the product.

1.1 Safety

Snifter requires 12- 24 VDC power supply. Although 12-24VDC voltage level is considered safe, but the process gas or dust particulates can be hazardous to health.



Take appropriate precautions when installing the monitor:

Unless the process conditions are known to be entirely safe, suitable precautions must be taken before any entry is made into the duct for installation or maintenance purposes.

- The unit may be installed in ducting, containing particulate, hazardous to health.
- The particulate may be inflammable, explosive or toxic
- The gas can be hot and pressurised

1.2 Product overview

The Snifter Dust monitor is a microprocessor-based, self-adjusting device, equipped with two alarm relays and indication LED in front cover.

The Snifter is designed for filter bag leak detection. It can also be used to detect blockage or stoppage in pneumatic transport and bulk solids handling. It is a compact unit with the sensor and control electronics built into one IP65 enclosure, which has been specifically designed for easy installation and operation. The Snifter is designed for applications at up to 2 bar and 140 °C.

1.3 How does it work?

The Snifter uses proven and reliable triboelectric technology where the interaction of particles with the sensor rod causes a small electrical charge to pass between the particulate and sensor.

It is this small electric charge that provides the signal monitored by the electronics, the signal generated is proportional to the dust level even if particles accumulate on the sensor. Experience has shown that this method of monitoring dust level in gasses, offers accurate results with minimum maintenance.

2. INSTALLATION

2.1 Selecting the installation location

The best location for installation of the units of the Snifter is in a section of duct where the particulate has an even distribution and the flow is as laminar as possible. This is to ensure that the sensor rod comes into contact with a representative flow of particles.

The ideal position would be in a section of duct that has no bends, valves, dampers or other obstructions for a distance equal to at least three duct diameters downstream or upstream (preferable 5 x duct diameter). See figure 1.

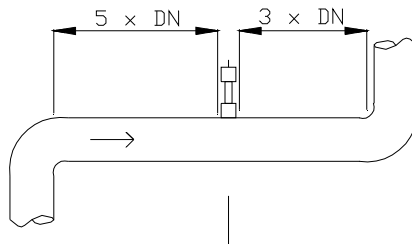


Figure 1. Recommended distances to duct bends (DN=Duct Diameter)

In some applications, a compromise must be made and the sensor will have to be fitted in a position that satisfies the majority of above requirements. The Snifter must be attached to metal ductwork so that they will be electrically shielded from interference and be provided with a ground reference.

1. The unit shall be installed in a position, where the gas flow passes the sensor rod in a 90° angle.
2. In round cross-section ducts, the unit can be installed in any position above the horizontal axis (between 9 o'clock and 3 o'clock). See figure 2a.
3. For square cross-section ducts, the unit must be positioned in the middle of the top or in the middle of one of the sides. See figure 2b.
4. Although the sensor is not affected by vibration, very high vibration levels should be avoided.
5. The units must not be installed in direct sunlight or in areas where the ambient temperature is above 60 °C.

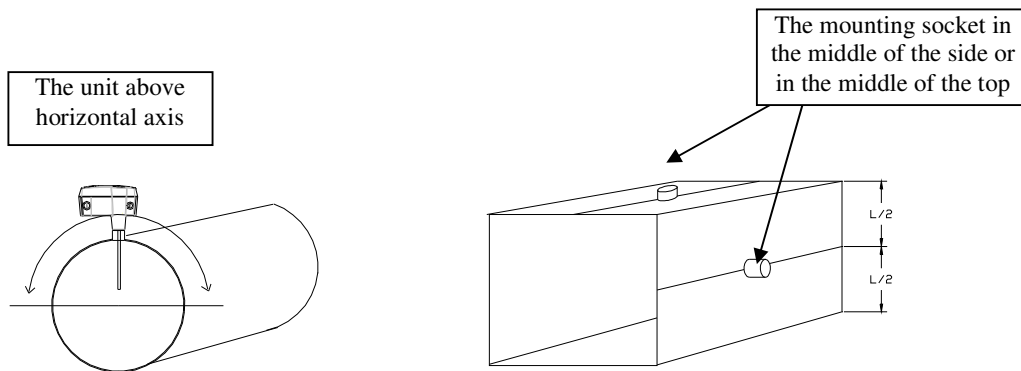


Figure 2a. Round cross-section duct

Figure 2b. Square cross-section duct

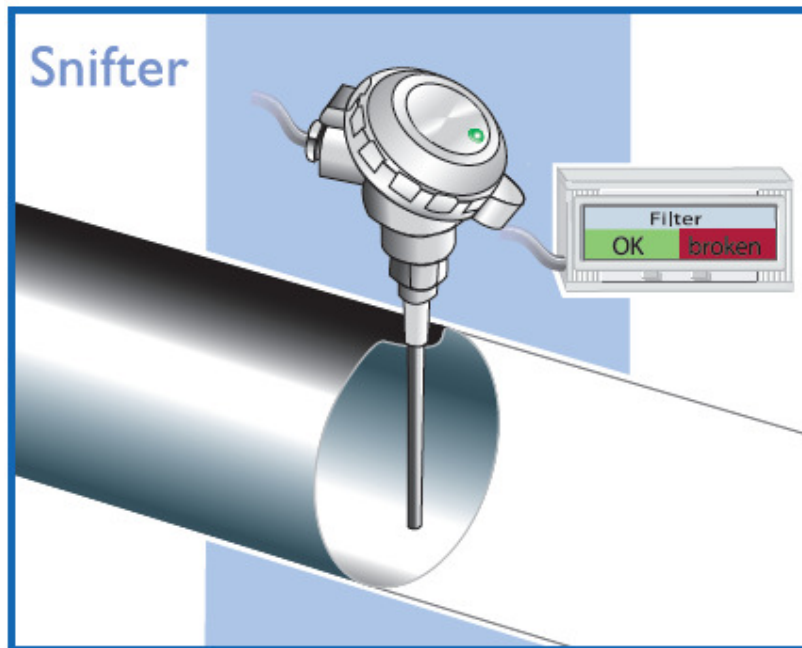


Figure 3. Snifter installed on a duct

NOTE !

The sensor must not contact the opposite wall or any other obstacle inside the duct. The only allowed interaction with sensor is dust particles.

2.2 Installing the sensor

Once the location of the unit has been selected, the Snifter with BSPT 1/2" male thread can be installed to process adapter with 1/2" female thread. Make sure the installation is in the right position, insert the sensor inside the adapter and rotate the Snifter until the connection is tight.

NOTE !

Do not over tighten the Snifter with process connection - It may cause damage to sensor and electronics.

3. WIRING

Required voltage for Snifter is 12-24 VDC

The snifter comes with two meter power and signal cable ready connected. There are 4 pairs (8 wires) in the same cable, two wires for 12-24 VDC and two for relays. Remaining four wires are not in use, they are for factory service/diagnostics purposes.

Connect the 12-24 VDC power supply to grey and pink wires. Blue and Red wires are for relays. Blue or Red gives the same voltage like power voltage when relay latches. Both relays must be connected to zero voltage (= 0V) with another wire.

<u>CONN1 pin number</u>	<u>wire Colour</u>	<u>signal name</u>
1	WHITE	Reserved for service/diagnostics
2	BROWN	
3	GREEN	
4	YELLOW	
5	GREY	V- (0 V)
6	PINK	V+ (12-24 VDC)
7	BLUE	relay 1
8	RED	relay 2

Cabling

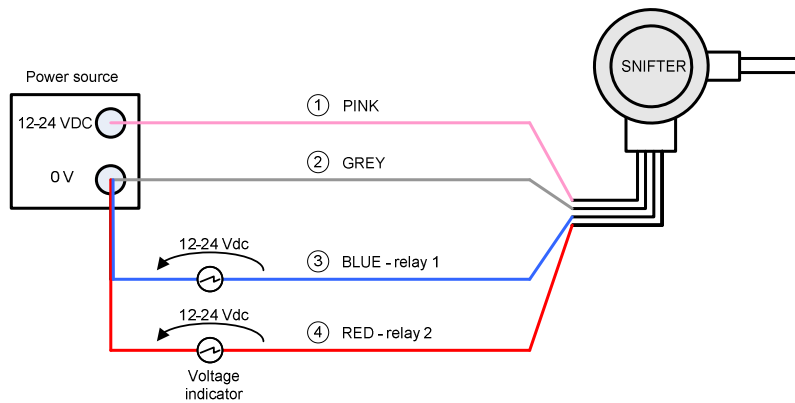



Figure 4. Wiring of power and signal cables

(1)	Voltage +	V+ (12 - 24 VDC)	colour PINK
(2)	Voltage -	V- (0VDC)	colour GREY
(3)	Signal out	V (12-24 VDC, $I_{\max} = 170 \text{ mA}$)	color BLUE
(4)	Signal out	V (12-24 VDC, $I_{\max} = 170 \text{ mA}$)	colour RED

4. TECHNICAL SPECIFICATION

Snifter specifications	
Measurement objects	Solid particles in a gas flow
Particle size	0,3 µm or larger
Measurement range	from 0,1 mg/m ³
Temperature	max 140 °C
Pressure	2 bar
Gas velocity	Min. 4 m/s
Humidity	95% RH (non-condensing)
Measurement principle	Triboelectric (electrostatic/-dynamic detection)
Damping time	1-300 seconds (predefined)
Output signals	2 solid state relays (170mA and 200mA)
Alarm settings	Alert - 5 x normal dust level Alarm - 20 x normal dust level
Ambient temperature	- 20 – + 60 °C
Probe	SS316 L (220 mm)
Enclosure	Aluminium
Protection category	IP65
Power supply	12-24 VDC
Power consumption	3 W
Cable (power + signal)	2 meter 4 pair cable
Installation	1/2" BSPT
Weight	Approx. 0,7 kg

This instrument conforms to the following standards

	Product standard - electrical equipment for measurement, control and laboratory use – EMC requirements	Reference standard IEC 61326-1:2005 (First Edition)
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6. OPERATION

The Snifter Dust Monitor measures the dust level in a gas flow by monitoring electrostatic/-dynamic discharge when charged dust particles hit or pass near by the probe. There are two solid state relay contact alarm outputs and three colour indicator LED in front cover.

The alarm relays are arranged such that relay 2 is ON (=connected) in normal operation. Relay 2 turns OFF and relay 1 ON when dust level exceeds 5x normal dust level and both relays are ON when dust level exceeds 20x normal.

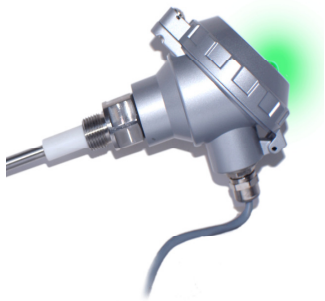
The alarm threshold factory default values:

Alert: > 5x normal dust level = Limit 1 value

Alarm: > 20x normal dust level = Limit 2 value

Three state of LED indicator

GREEN



NORMAL

ORANGE



ALERT

dust concentration
> 5x NORMAL

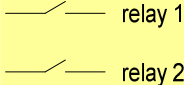
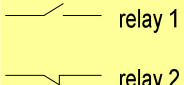
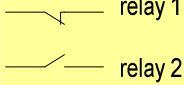
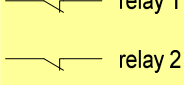
RED



ALARM

dust concentration
> 20x NORMAL

Relay and LED indicator functions

relay on/off	relay state	Signal level	led indicator	operation
Both relays OFF		Power OFF or fault	OFF	Power OFF or failure
Relay 2 ON (alone)		Signal < Limit1	GREEN	Normal
Relay 1 ON (alone)		Limit1 < signal < Limit2	YELLOW	Alert
Both relays ON		signal > Limit 2	RED	Alarm

7. AUTOMATIC SETUP

To be able to detect variations in dust flow, and to set the alarm so that it will go on if there is excessive dust flow, **you must determine the typical dust flow in the application when the process is operating normally.**

The unit has an AUTOMATIC SETUP function. AUTOMATIC SETUP sets the parameters so, the relays gives the alert when the dust concentration exceeds 5x the typical dust level and an alarm when 20x typical level is exceeded. (See table on page 13)

Connect the sensor to the duct – connect the power on – wait 10 minutes – start the auto setup procedure – close the cover.

For AUTOMATIC SETUP you need to know that the process is running with **a normal dust flow rate.** Then open the cover of the unit, and initiate AUTOMATIC SETUP by pressing the small button, (see Figure 6). The green LED indicator in front cover starts blinking when AUTOSETUP PROCEDURE is going on.

AUTOMATIC SETUP procedure takes up to 10 minutes to be completed, green LED in front cover stops blinking and Sniffer is ready for use.

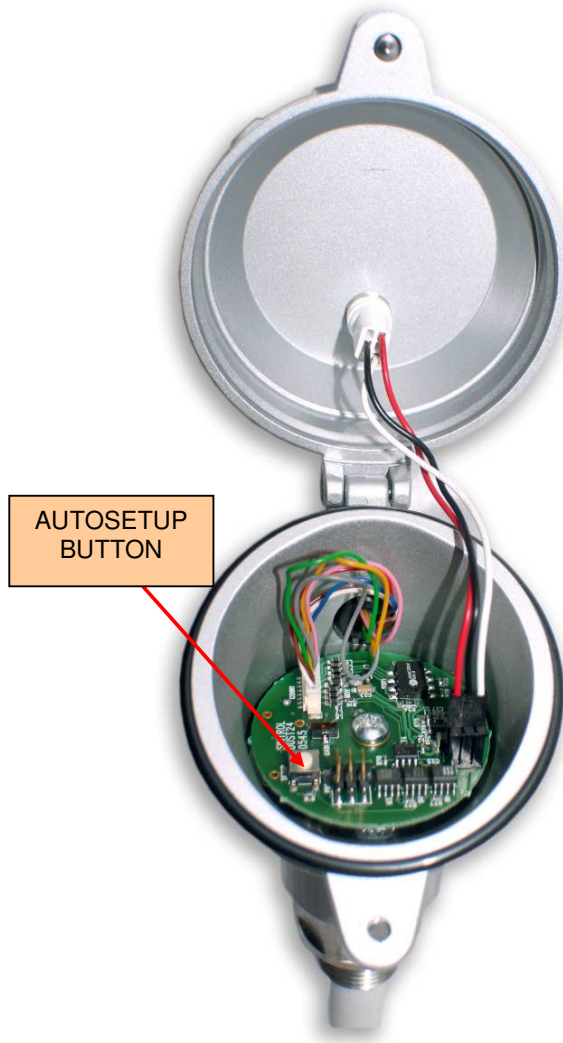
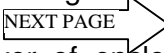


Figure 6. Automatic setup button

AUTOMATIC SETUP

1. Ensure that the process is in normal conditions.
2. Make sure that the monitor has been connected to process and powered for at least 10 minutes in order to warm up and stabilise!
3. Press the AUTOMATIC SETUP BUTTON (the small button on printed circuit board) Figure 6.
4. Make sure that green LED indicator in front cover starts blinking. 
5. Turn the cover of enclosure closed and wait for up to 10 minutes until the green LED stops blinking indicating the Automatic Setup sequence has finished.
6. The unit is ready for use.

8. MAINTENANCE

Snifter Dust Monitor needs very little maintenance. To achieve maximum reliable operation the recommended maintenance interval is 2 months.

Maintenance is done by removing the unit from the process and cleaning the sensor rod to prevent signal leakage to ground.

If the particles in the gas are sticky and tend to build up, the cleaning needs to be done more often.

Check the PC board is firmly connected inside the enclosure. Check LED indicator cable and signal/power cable connectors are connected correctly.

9. TROUBLESHOOTING

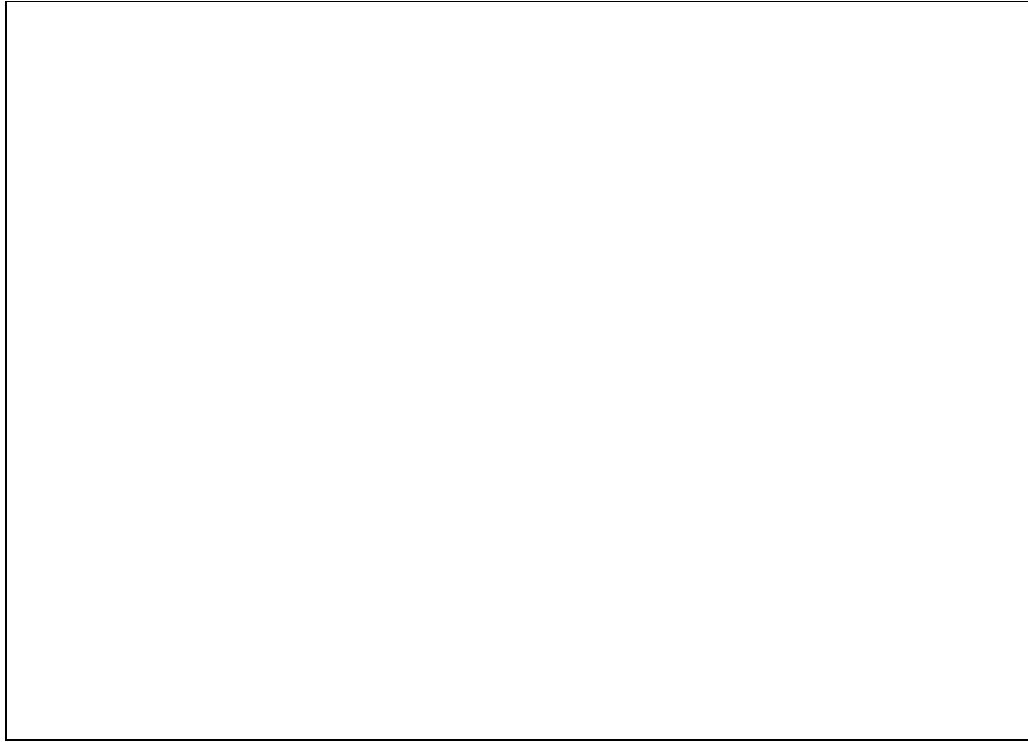
9.1. The Monitor is not giving relay output signal

1. Check the power and signal wiring are connected correctly.
2. Check there is power on (cover LED glows).
3. Do the auto setup procedure (green LED starts blinking – stops when ready).

If the monitor is not giving any relay output signal after checks 1, 2 and 3 contact your local distributor.

9.2. The Monitor is not responding after autoseup procedure

1. Check that there is normal process going on and there were normal operation conditions during auto setup.
2. Check the power and signal wiring are connected correctly.
3. Check the signal is not leaking to ground.
 - There is NO contact between metal sensor probe and duct wall.
 - Ensure the gas is not condensing (causes signal leakage)
 - Check the sticky dust does not build up on the base of the sensor and no bridging between sensor probe and duct wall.



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