

Dust Detector / Filter Monitor



- Continuous dust measurement
- Reliable filter damage detection
- Not affected by dust deposits
- Sensor rod length between 45 and 800 mm
- Robust, compact design
- Very easy to use
- 3-year guarantee

Applications

The DYNAguard GM dust monitor continuously measures the dust concentration in ducts.

The most common application is filter monitoring on the clean gas side downstream of dedusting systems.

Filter damage, installation errors and even small filter cracks can be detected reliably and without delay.

The sensor is also a reliable monitor in the exhaust duct downstream of cyclones for the early detection of faults during the separation of powders and bulk solids.

In some processes, its use on the raw gas side – i.e. upstream of a filter or separator – is also helpful.

Excessive suction, resulting in product loss, can be detected and avoided.

In other cases, heavy dust formation occurs only occasionally. Here, the sensor can detect an increase on the raw gas side and thus increase the extraction capacity of the filter system as required – to save energy in normal situations.

The DYNAairguard can measure dust in ambient air (leak detection).

Advantages

- Immediate detection of filter damage
- Automated 24/7 monitoring
- Keeps staff safe when returning clean gas to the production hall
- Prevents consequential damage
- Prevents product loss

How it works

DYNAguard technology is based on the electrostatic measurement principle (modified triboelectric principle), which detects particles that collide with or fly past the sensor rod. Deposits on the sensor rod do not affect the measurement; only moving particles generate a signal proportional to the throughput, which the electronics evaluates.

Signal attenuation is individually adjustable so that short spikes (e.g. during regular filter cleaning) do not cause false alarms.

Sensitivity can be easily adjusted to suit the process.

Measured value output

The DYNAguard GM is manufactured in two different versions:

The version with relay output has a 10-digit LED display that shows the signal level. This makes it very easy to set the three parameters: signal amplification, attenuation and alarm threshold.

The analogue output version offers the option of continuously displaying the signal level via a PLC and monitoring several filter system limit values (pre-alarm) and cleaning cycles (peak height). Trends can also be viewed.

Sensor rod length

The rule of thumb for calculating the sensor rod length is as follows:

1/3 to 2/3 of the duct diameter.

The DYNAguard GM is available with the following sensor rod lengths:

- 45 mm
- 80 mm
- 100 mm
- 150 mm
- 200 mm
- 250 mm
- 300 mm
- 400 mm
- 500 mm
- 600 mm
- 700 mm
- 800 mm

The different lengths eliminate the need for the customer or start-up engineer to adjust the rod manually. (However, it can be shortened later if necessary.)

In addition, even with very large air ducts, only one device is usually required.

Process temperature

The standard version of the dust detector can be used up to a process temperature of 90°C. Three high-temperature versions are available for temperatures up to 130°C, 200°C and 290°C, respectively. The 200°C and 290°C versions are manufactured with an additional heat sink (see below).

Technical data

Supply (versions with switching output)	17 to 31 V DC, max. 60 mA
Supply (versions with analogue output)	17 to 31 V DC, max. 90 mA
Output (versions with relay switching output)	Max. 48 V AC/DC, 1 A, high/low switchable logic
Output (versions with analogue output)	4 to 20 mA, active, galvanically isolated, load < 500 Ω
Sensitivity	Max. 0.1 mg/m ³ Gain adjustable from 1 to 180000
Damping	0 to 10 s (versions with switching output) 0 to 60 s (versions with analogue output)
Switching point (versions with switching output)	Adjustable from 1 to 10
Adjustment (versions with analogue output)	4 mA zero level
Ambient temperature	-20°C to +70°C (-4°F to 158°F)
Process temperature	Standard: max. 90°C (194°F) Optionally, up to 130°C (HT130), 200°C (HT200) or 290°C (HT290)
Process pressure	Max. 6 bar (84 lbs) Optionally, up to 25 bar
Materials (electronics housing)	Stainless steel 1.4305 (AISI 303) (standard) Optional stainless steel 1.4571, titanium
Materials (sensor rod)	Stainless steel 1.4571 (AISI 316Ti) (standard)
Materials (insulation)	Polyamide (PA) (standard) PEEK (HR130 and HT200 versions) Tecasint 4011 (HT290 version)
Materials (seal)	NBR (standard) Silicone (HR130 and HT200 versions) FFPM (HT290 version)
International Protection Rating	IP67 (EN 60529)
Interference immunity	according to EN 61326-1
Weight	2 to 3.8 kg (depending on the version)

Subject to changes.

Certificates

MTBF: 112 years according to Siemens standard SN29500-1.

No explosive hybrid mixtures may be fed inside the ducts.

Device versions for zones 2/22 and 21/20 are available for use in explosive areas:

Zone 2 0 (and 21):



Dust: II 1D Ex ta IIIC T 200 152°C Da IP64



Dust: Ex ta IIIC T 200 152°C Da IP64

Zone 2/22:



Gas: II 3G Ex ec IIC T4 Gc
Dust: II 3D Ex tc IIIC T100°C Dc IP65

Zone 2/22, temperatures up to 200°C:

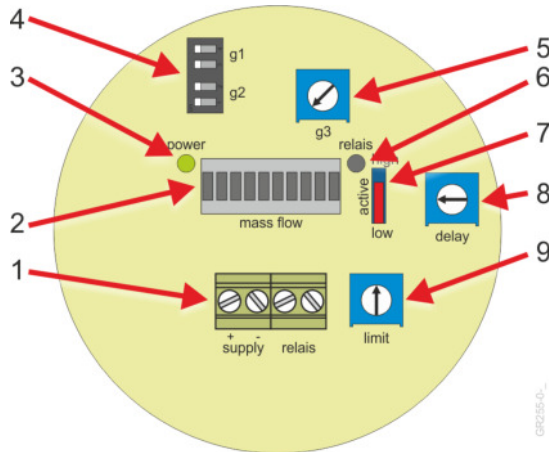


Gas: II 3G Ex ec IIC T3 Gc
Dust: II 3D Ex tc IIIC T150°C Dc IP65

DYNAguard in Detail

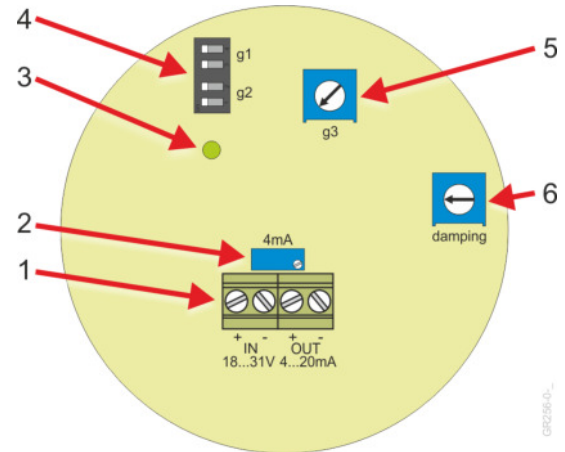
Controls

Versions with switching output



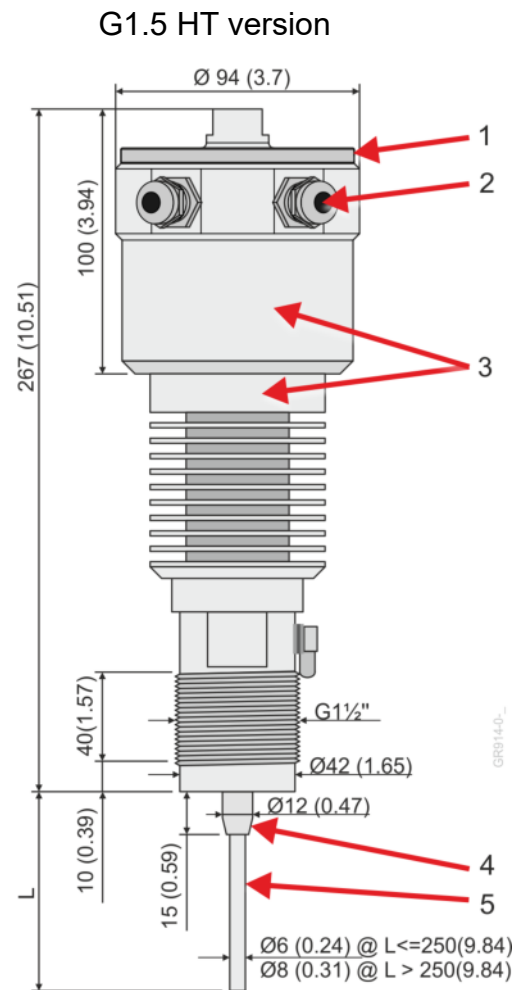
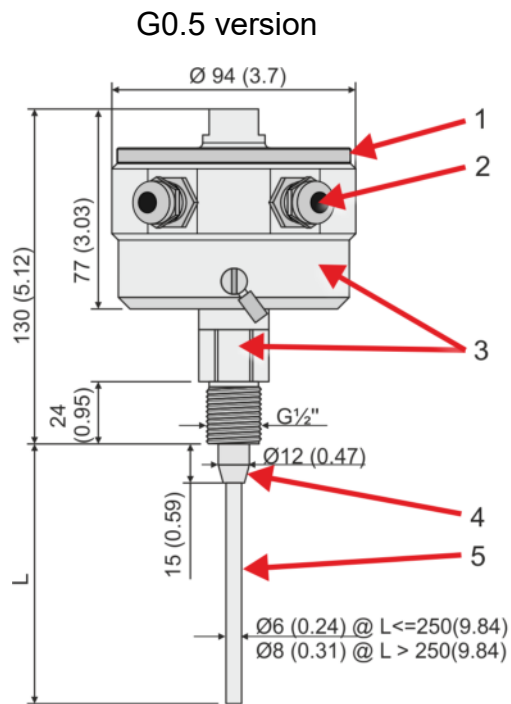
- 1 Terminals
- 2 Throughput display
- 3 Operating indicator
- 4 Gain setting stages 1 and 2
- 5 Stage 3 gain setting
- 6 Alarm display
- 7 Selector switch for the switching behaviour
- 8 Damping adjustment
- 9 Setting of the trigger level

Versions with analogue output



- 1 Terminals
- 2 Adjustment potentiometer for the current output
- 3 Operating indicator
- 4 Gain setting stages 1 and 2
- 5 Stage 3 gain setting
- 6 Damping adjustment

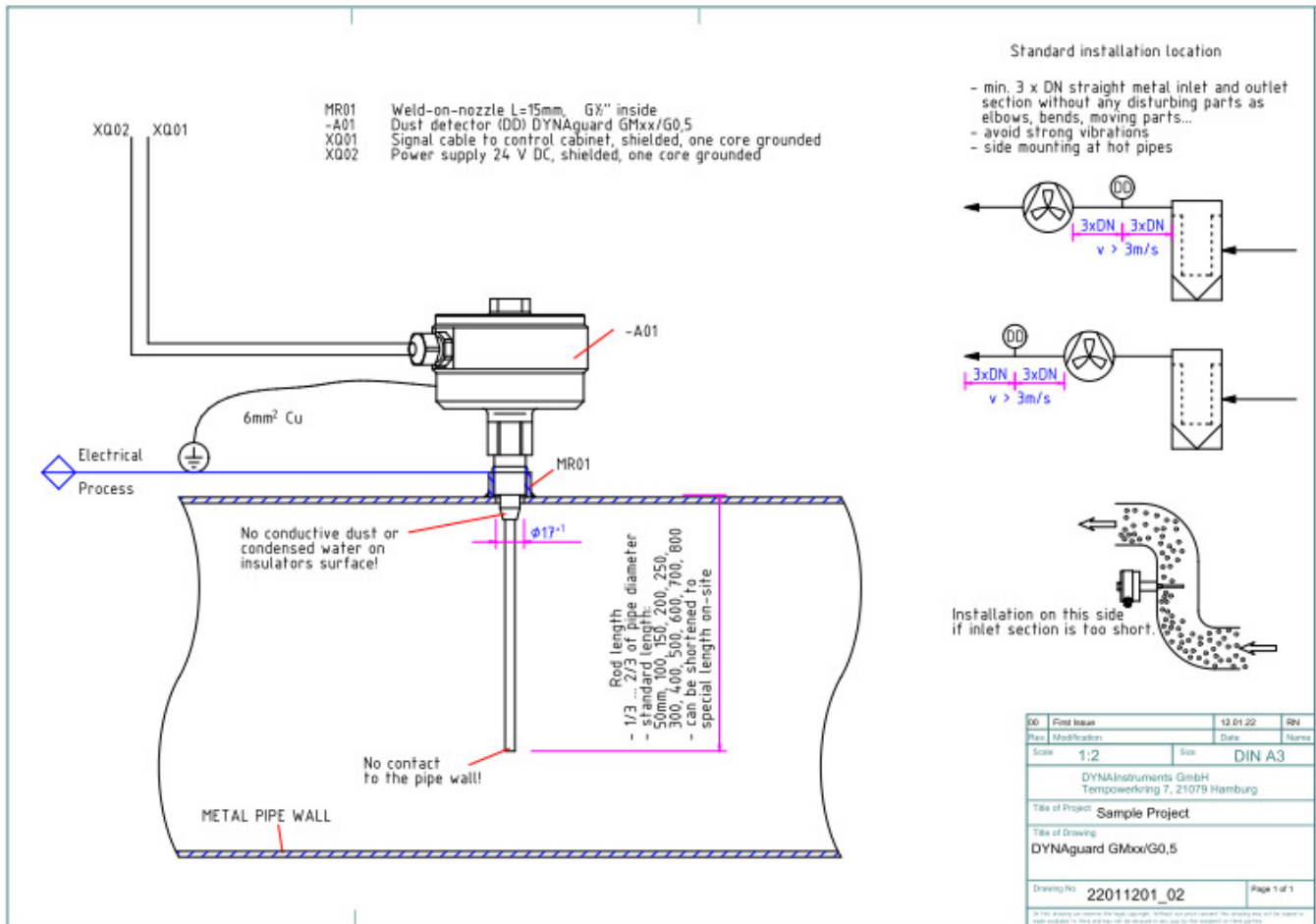
Dimensions



Dimensions in mm (inches).

- 1 Screw cap with key attachment
- 2 Cable gland M16 x 1.5
- 3 Electronics housing
- 4 Sensor insulation
- 5 Sensor rod

Installation



The device is adjusted under normal conditions, and the alarm point (versions with switching output) is set above this level. The user can also adjust the damping.

The length of the sensor rod should be 1/3 to 2/3 of the duct diameter, and a maximum of 800 mm.

Installation on metal ducts is by welding on a threaded sleeve and screwing in the DYNAguard.

A straight inlet and outlet section without bends or fittings such as valves or flaps should be at least three times the duct diameter.

Commissioning is simple and requires no special tools or equipment.

Mounting accessories

Threaded sleeve

Available in 0.5 and 1.5 inches and in steel (St 37 black) or stainless steel (1.4301).



Flange with threaded connection

For mounting on pipe sockets, e.g. for high-temperature applications



Tri-clamp adapter

If the sensor needs to be removed regularly, e.g. to clean conductive build-up on the sensor rod insulation, we recommend using a clamp adapter (instead of a threaded sleeve) for mounting:

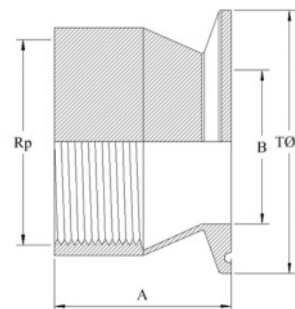
- Remove and refit the sensor in no time at all
- The wiring does not need to be disconnected
- Secure installation



Screw-on connector

Dimensions:

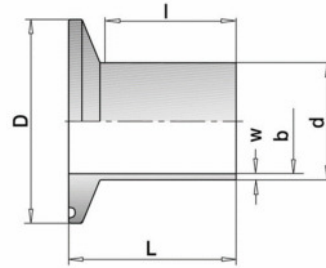
Thread (Rp)	1/2 inch
Disc (T)Ø	34 mm (DN20)
Overall length (A)	40 mm
Hole diameter (B)	20 mm
Material	Stainless steel 1.4404



Weld-on nozzle

Dimensions:

Disc (D)Ø	34 mm (DN20)
Overall length (L)	18 mm
Duct (inner) (b)	20 mm
Duct (outer) (d)	23 mm
Material	Stainless steel 1.4404



Purge air adapter

A purge air adapter can be used to prevent conductive build-up on the sensor rod insulation.

Device connection	G 1/2" female thread
Process connection	G 1/2" male thread
Purge air hose	
Outer diameter	8 mm



Order code DYNAguard a/b/c/d/e/f/g/h

	a	Output										
	01	Relay output										
	20	Analogue output 4 to 20 mA										
		b	Size									
		G1.5	Screw-in thread G 1 ½"									
		G0.5	Screw-in thread G ½"									
			c	Length L of the sensor rod								
			45	45 mm								
			50	50 mm								
			100	100 mm								
			150	150 mm								
			200	200 mm								
			250	250 mm								
			300	300 mm								
			400	400 mm								
			500	500 mm								
			600	600 mm								
			700	700 mm								
			800	800 mm								
				d	Sensor rod material							
			20	1.4571 (AISI 316Ti)								
				e	Sensor insulation material							
			20	PTFE								
			30	PEEK (for HR130 and HT200 versions)								
			32	Tecasint 4011 (high-temperature polyimide, for HT290 version)								
			40	FFPM								
			51	PA (standard)								
			58	PA (FDA approved)								
				f	Seal material							
			00	NBR (standard)								
			10	FPM								
			13	FPM (fluoro-rubber, FDA approved)								
			20	Silicone (for HT130 and HT200 versions)								
			40	FFPM (for HT290 version)								
				g	Options							
				<u>HT130</u>	High temperature (130°C)							
				<u>HT200</u>	High temperature (200°C)							
				HT290	High temperature (290°C)							
				H	Approvals							
				(none)	Version for non-hazardous areas							
				<u>EX2-20</u>	II 1D Ex ta IIIC T 200 152°C Da IP64							
				<u>Ex2 X</u>	II 3G Ex ec IIB T4 Gc II 3D Ex tc IIIC T100°C Dc IP65							
DYNAguard GM												

Example: DYNAguard GM01/G0.5/200/20/51/10/EX2 X

Other designs are available on request.

Innovative solutions – proven technology for over 30 years

- Mass flow measurement
- Flow monitoring
- Dust measurement
- Velocity measurement
- Fill level detection
- Particle size measurement



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