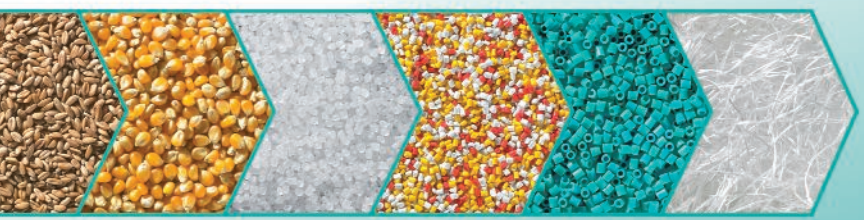
# DYNAguard

## Flow Switches for Bulk Solids

- Preventive & safe
- Contact-less
- Maintenance-free



DYNA Instruments

Instrumentation for Powder and Bulk Industries

# DYNAguard Series

## Easy Monitoring of your Bulk Solids Process

- Blockage alarm
- Filter monitoring
- Bridging
- Flow monitoring of additives
- Empty hopper alarm
- Leakage monitoring
- Sieve-/screen monitoring
- Overflow alarm

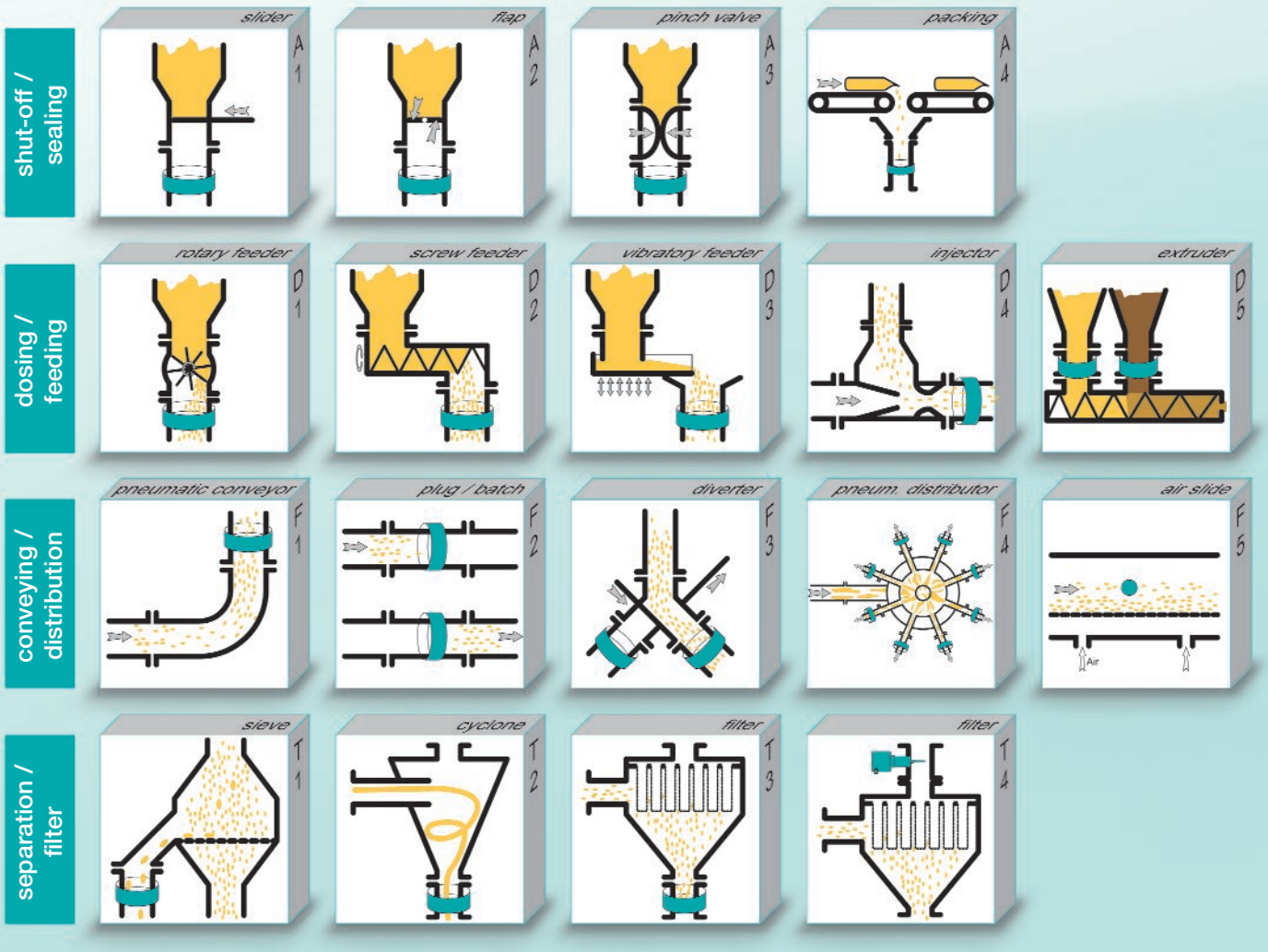
With the various instruments of the **DYNAguard Series**, there is a solution for almost every task when monitoring of transport processes for bulk solids is needed.

Disturbances in transport systems for powder, granulates, pellets and other bulk solids are detected early and severe subsequent damages can be avoided.
Because of the non-contact measurement, transport processes remain undisturbed. With the use of different measurement principles, the best possible choice for the individual application can be made.

From mass flow rates of several t/h to the lowest concentrations of 0,1 mg/m³, dust or any bulk material is reliably detected. The adjustment of the devices to the process and the setting of the thresholds are made with the self-explanatory control elements in the IP67 electronics housing.

We will also be glad to offer you customized versions and individual solutions — also for the lot-size 1.

## Applications




Flow switch
DYNAguard, schematic

# DYNAguard K

## Flow Switch for Small Pipe Diameters

- Integral measurement over the whole pipeline cross section
- Easy installation between DIN-/ ANSI flanges up to 40 bar (570 lbs)
- Relay or analog output (4…20 mA)
- EX zone 2/22

The flow switch **DYNAguard K** is used to monitor the flow of bulk solids in pipelines between DN10 to DN100 (0,5" to 4''), in pneumatic conveying systems or in free fall applications. The device covers a very wide range of throughput from a few grams to many tons per hour. With the analog output version (4… 20 mA), several thresholds can be monitored and a flow trend can be output if connected with a PLC.
The instrument has also proven itself in harsh environments e.g. at blast furnaces in steelworks. For very abrasive products a wear protection inlet is available.


# DYNAguard V

## Flow Switch for Large Pipe Diameters and Special Products

- Integral measurement over the whole pipe cross section
- Relay or analog output (4…20 mA)
- EX zone 2/22

In combination with a number of different process couplings, the **DYNAguard V** is the most variable flow switch and allows an easy integration into the process — also in existing plants.
Solutions for very diverse tasks in various industries from pharmaceutical, chemical via building materials, animal feed and food industry to waste incineration plants have been realized.
The flow switch can monitor high tonnages or a few milligrams, integrally over the whole pipe cross-section.
The measuring system has a modular design. Sensor electronics and process coupling are separate components, which is beneficial when it comes to replacement or expansion.
We will be glad to also offer customized versions.

*The **electrostatic measurement principle** is based on the detection of moving electrical charges which naturally exist on the particles in the product stream. Nonmoving material like deposits will not be detected.*

# DYNAguard M

## Flow Switch with Large Detection Area

- Microwave measurement principle
- Relay output

The flow switch **DYNAguard M** detects moving bulk solids in open and closed conveying systems in which also larger distances to the conveyed material are possible.
Solids which move through the detection area with a minimum velocity of 0,1 m/s are detected independently from the direction of movement.
The **DYNAguard M** is installed at an angle of 45° to 90° of the flow direction. Moving mechanical components like rotary valves, flaps or the like should not be located in the detection area, because they could be interpreted as moving bulk solids. If such a »disturbance source« cannot be blinded out by signal damping or shielding, a **DYNAguard** using the electrostatic measurement principle, e.g. the **DYNAguard P**, will be a solution.

*The **measurement principle** of the **DYNAguard M** is based on the physical principle of the Doppler effect. The sensor sends out a microwave field which is reflected if solids are moving through the detection area. The sensor evaluates the received microwaves and converts the signal into a switching operation. Nonmoving material like deposits will not be detected.*

# DYNAguard P

## Flow Switch with Small Detection Area

- Relay or analog output (4…20 mA)
- ATEX zone 2/22

The flow switch **DYNAguard P** is designed to monitor moving bulk material in pipelines such as in pneumatic conveying systems, free fall applications, chutes, angled pipelines or also as an empty indicator underneath silos and hoppers for a large throughput range from a few g/h to many t/h.
The detection area is just a few centimeters around the sensor surface, so that it also can be used very close to moving components like flaps, rotary valves or slide valves.
If the pipeline is made of non-conductive material,the device can be installed without opening the pipeline. Because of the special measurement principle also movements of plain sheets, boards or bars can be detected.

# DYNAguard S

## Flow Switch for Flexible Hoses

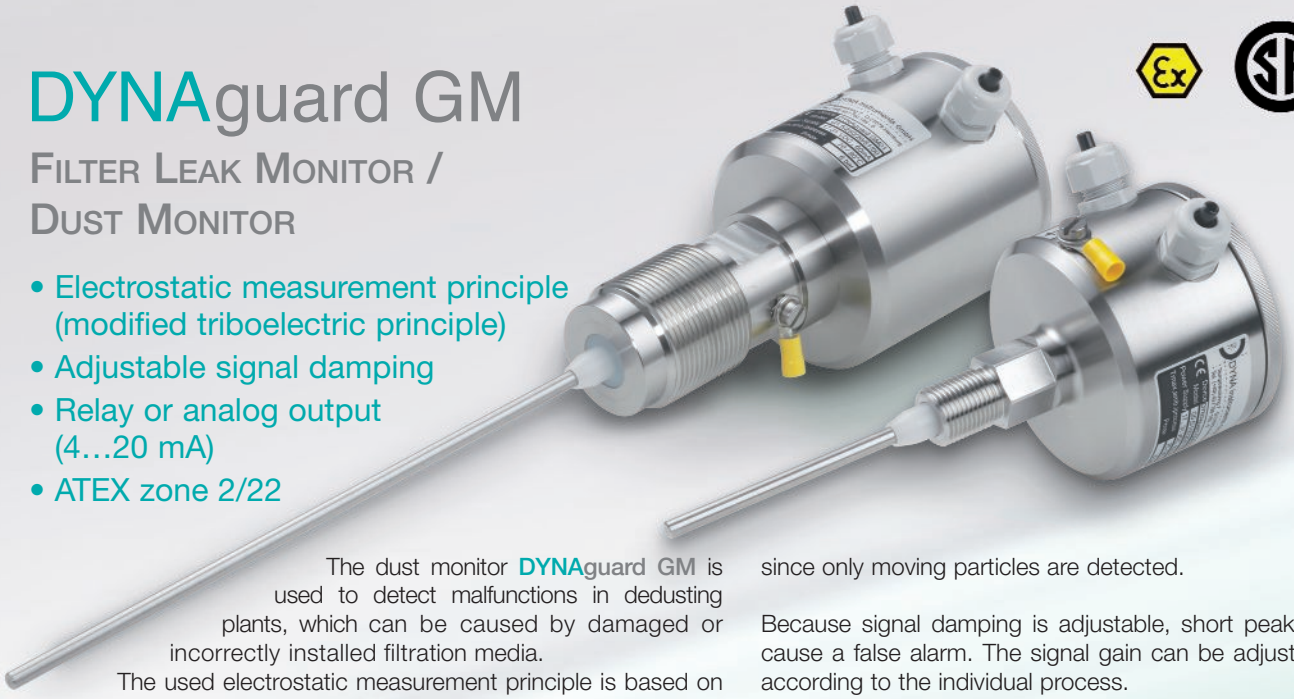
- Integral measurement
- For conductive and non-conductive hoses
- Relay or analog output (4…20 mA)
- ATEX zone 2/22


When granulates, powders, blasting material, dust or other solids are transported in flexible hoses, clogging, an empty hopper or a product-bridge at the bottom of a storage tank can be detected immediately and securely by the **DYNAguard S**.
The hose (outer diameter 4…16 mm) is either fed through the sensor and fixed (version T), or it is cut and inserted into the hose fittings at the device (version E). For conductive hoses the version E can be used.

# DYNAguard GM

## Filter Leak Monitor / Dust Monitor

- Electrostatic measurement principle (modified triboelectric principle)
- Adjustable signal damping
- Relay or analog output (4…20 mA)
- ATEX zone 2/22



The dust monitor **DYNAguard GM** is used to detect malfunctions in dedusting plants, which can be caused by damaged or incorrectly installed filtration media.

The used electrostatic measurement principle is based on a modified triboelectric principle. Not only particles which hit the measuring rod are detected, but also those passing by.

Deposits on the sensor rod do not influence the measurement, since only moving particles are detected.

Because signal damping is adjustable, short peaks do not cause a false alarm. The signal gain can be adjusted easily according to the individual process.

With the analog output version (in connection with a PLC) it is possible to monitor more than one threshold and to plan filter maintenance by monitoring the cleaning cycles.

## Technical Data

| |  DYNAguard M |  DYNAguard P |  DYNAguard K |  DYNAguard V |  DYNAguard S |  DYNAguard GM |
|---|---|---|---|---|---|---|
| measurement principle | microwave | electrostatic | electrostatic | electrostatic | electrostatic | electrostatic *(modified tribo-electric principle)* |
| detection area | 1 m | app. 150 mm | integral | integral | integral | 40 mm - 800 mm *(sensor rod length)* |
| process temperature | max. +90°C | max. +90°C *(optional 200°C)* | max. +90°C *(optional 130°C)* | max. +130°C | max. +70°C | max. +90°C / +130°C +200°C / +290°C |
| process pressure | 2 bar *(optional 25 bar)* | 6 bar *(optional 40 bar)* | 40 bar | 6 - 40 bar | 10 bar | 6 bar |
| process connection | G 1 1/2 " | G 1 1/2 " | DN 10 - DN 100 | DN 125 - DN 400 | flexible hose ø 4-16 mm | G 1/2 " or G 1 1/2 " |
| output | relay | relay transistor analog 4 - 20 mA | relay transistor analog 4 - 20 mA | relay transistor analog 4 - 20 mA | relay transistor analog 4 - 20 mA | relay transistor analog 4 - 20 mA |
| approvals | — | ATEX zone 2/22 | ATEX zone 2/22 | ATEX zone 2/22 | ATEX zone 2/22 | ATEX zone 2/22 CSA Div. 2 |

# DYNAInstruments

## Technical centre

- DYNA test plant *(picture left)*
  Tests with customer products possible
- Security of investment
- High application competence
- In-house development
- In-house production
- Made in Germany

## INNOVATIVE SOLUTIONS · PROVEN TECHNOLOGY
FOR MORE THAN 20 YEARS

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