



## Measuring Systems for Solids

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measuring system for bulk materials



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# HUMY 3000/3019/300

Continuous inline moisture measuring system  
for bulk materials



## Application

The moisture in solids is an important parameter which strongly influences the quality of the product and can increase the economic efficiency of a production fundamentally. HUMY 3019 is in many processes, successfully in use among others at sugar, tobacco, grain, malt, flour, coal, sand, wood shavings, dried food, fertilizer, powder, pigments, plastic granules. As installation places conveyor belts, screw conveyors, silos, funnels are particularly suitable. The In-Line moisture measurement is also possible in batch processes.

At the measuring the relative permittivity and the high-frequency recession of the solid is measured in the high-frequency range. The measurement procedure makes a short and simple calibration as well as a high precision of up to 0.1% possible.

The measuring probe transmits the data digitally. This makes the measurement assignment disturbance insensitive and allows a distance of the sensor to the end judging unity up to 1000 m. The system supervising

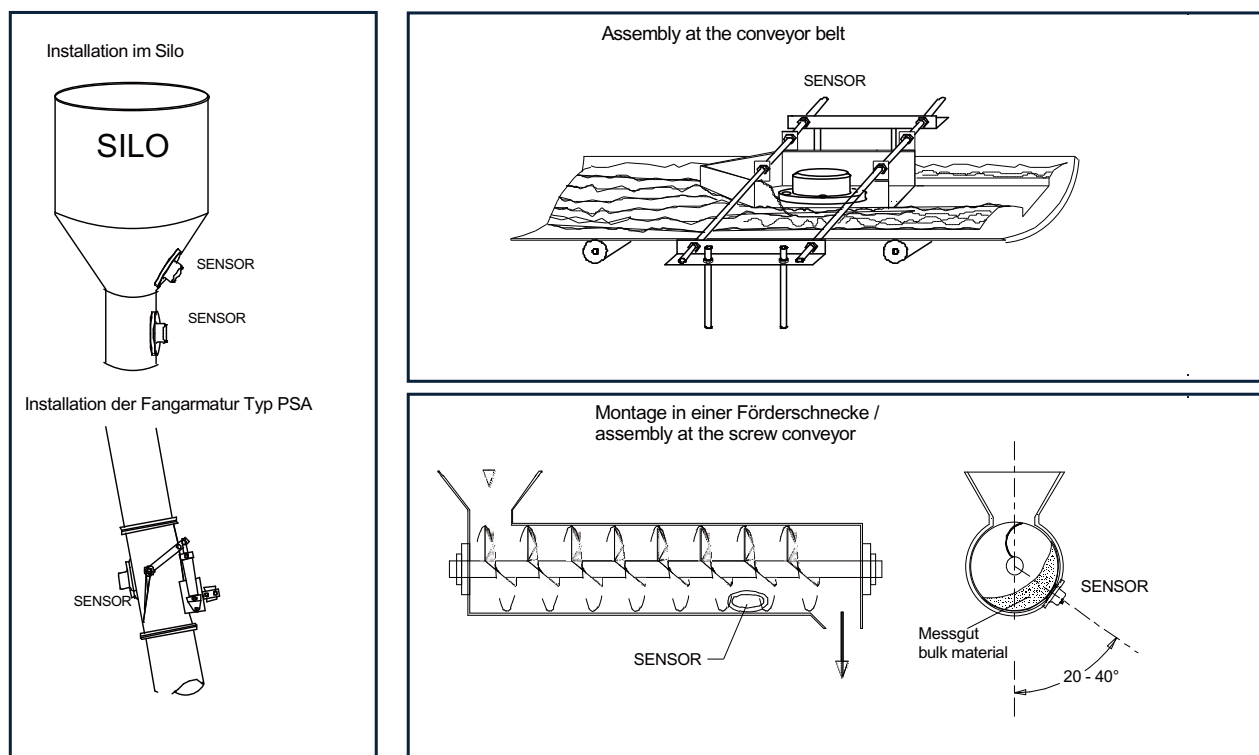
itself has an integrated data logger besides an automatic compensation of temperature and ageing drift, digital and alarm exits. The device is working by two analog output for the measured values and can be used

automatically by the two digital inputs or the RS485-interface. The calibration will be done by the included software. For product or process changes different product parameters can be stored.

## Main Benefits

- No samples for the laboratory necessary
- Saving of energy costs
- Improvement on the product quality
- Very short amortization time
- High selective sensitiveness
- High measuring speed
- Precision better than 0,1% (under consideration of the product)
- Easy and economical installation
- Fast and simple calibration
- Optional ATEX-Version for Zone 20 und Zone 0

## Examples for Installations





## Application examples of successfully measured products

### Chemicals and pharmaceutical

Fertilizer, plastics, phosphate, granules, absorber materials, melamine, powders, tablets, pasta, foils, salt, potash washing-powder, styrofoam, synthetic material, PVC, acryl pigments

### Food- and animal food industry

Grain, rape, sunflower seeds, sugar beets, potato products, flour, starch, milk powder, yeast, bean oil production, casein, gluten, gelatine, malt, hops soya, corn, lenses rice, pasta, beans confectionery, cereals, food means, fish meal, dried food

### Steel industry and power plants:

Ash, Aluminium oxide, iron, cole, coal, coal dust, coke, hydrated lime, sand, quartz, bricks (raw material), ceramic (raw material), gypsum

### Wood and paper industry:

Cellulose, saw dust, wood chips, wood pellets

### Construction material industry:

Cement, iron-II-sulfat, sand, quartz, gypsum, hydrated lime, limestone powder, bentonite, bricks (raw material), ceramic (raw material)

### Other:

Tobacco, nuts, coffee and cacao beans, biscuits, cotton, leather, spices, blossoms

## Application



Sand



Animal feed



Mounting in discharge screw (wood-fired power plant)



Grain



Cereals



Coal

## Humy 3000 Technical Data Measuring Unit



Construction E



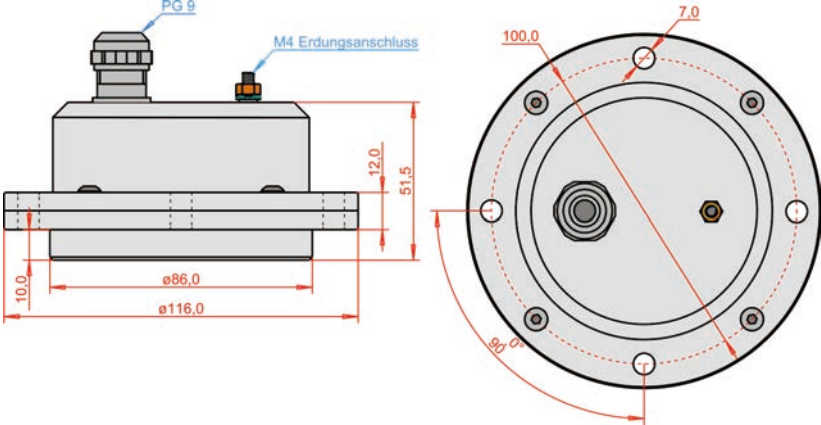
Construction T



Construction S

|                          |                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction F           | Field-/wall-mounting housing, B 265 x H 240 x T 250, weight approx. 6.500 g, with sight-door IP65                                                                                                                                                                                                                                                                         |
| Construction T           | Desk-housing B 236 x H 132 x T 330mm, weight approx. 4.500g, Option panel housing                                                                                                                                                                                                                                                                                         |
| Construction E           | 19"-plugin 3HE / 42 TE, weight approx. 2.000 g                                                                                                                                                                                                                                                                                                                            |
| Construction S           | Panel housing with sight door<br>B270 x H183 x T223, IP 58                                                                                                                                                                                                                                                                                                                |
| Indication               | 1/4 VGA-LC-Display 100 x 77 mm, 320 x 240 colour-pixel.<br>For analogue and digital measurement representation                                                                                                                                                                                                                                                            |
| Display                  | Date, time, kind of product, temperature, value of residual, moisture or value of dehydrated substance, Min- and Max-alarm values, analog bar graph indication, dragging pointer width of deviation of measuring value with intensified indication of width of deviation of measuring value, digital indication and description of Min-/Max-limit values and the softkeys |
| Digital resolution       | 20 Bit for 0-85,0% moisture and 15 - 100% dry substance                                                                                                                                                                                                                                                                                                                   |
| Measuring range moisture | Min. 0.02 – 0.10%, max. 0.02 – 90.00%, with 1-,2- or 3 digits behind the point                                                                                                                                                                                                                                                                                            |
| Measuring range temp.    | Span min.: 0-5° C, Span max.: 0-120° C                                                                                                                                                                                                                                                                                                                                    |
| Accuracy                 | Max. 0.1 % in accordance to material to be measured                                                                                                                                                                                                                                                                                                                       |
| Handling                 | Foil-keyboard with each 4 pcs. 10-Block + Function keys + Softkeys                                                                                                                                                                                                                                                                                                        |
| Averaging time           | 0-999 sec.                                                                                                                                                                                                                                                                                                                                                                |
| Memory                   | User-memory for storage of parameters of 24 different products.                                                                                                                                                                                                                                                                                                           |
| Data logger              | Storage of historical values up to 10 years. Real time clock for measurement record keeping.                                                                                                                                                                                                                                                                              |
| Relay output             | Normally opened and normally closed contact for each Min- and Max-alarm relay<br>Contact load: 30VDC or 62.5 VAC                                                                                                                                                                                                                                                          |
| Analog output            | Measuring value of residual moisture or dehydrated substance 0/4-20 mA<br>(load 750 Ω. measuring value of product temperature, 0/4-20 mA, max. load 750 Ω.                                                                                                                                                                                                                |
| Analog input             | mA- and PT 100- input                                                                                                                                                                                                                                                                                                                                                     |
| Digital output           | 2x galvanic isolated, 24 V open-drain(max. 50mA)                                                                                                                                                                                                                                                                                                                          |
| Digital input            | 2x galvanic isolated, active signals (8-36 V)                                                                                                                                                                                                                                                                                                                             |
| Interface                | RS 232 with connection for RxD, TxD, OV and RS 485                                                                                                                                                                                                                                                                                                                        |
| Power supply             | 230 V AC / 115 V AC or 24 V AC/DC<br>All supplies can be available simultaneously<br>(230 V AC und 24 V AC/DC or 115 V AC und 24 V AC/DC).                                                                                                                                                                                                                                |

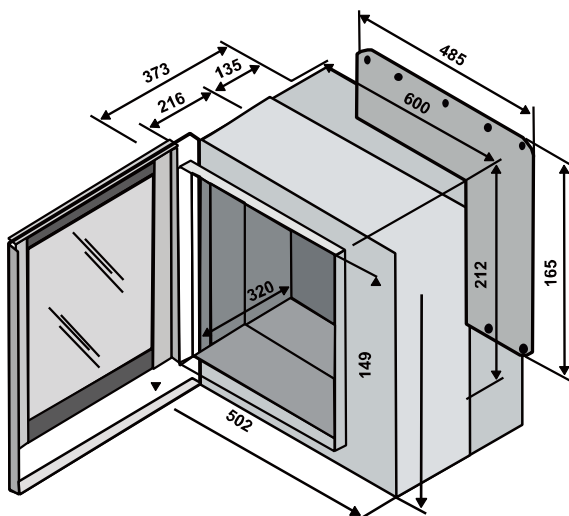
## Technical Data Moisture Sesor

|                                                                                    |                                                           |
|------------------------------------------------------------------------------------|-----------------------------------------------------------|
|  |                                                           |
| FMS 400 K                                                                          | Measuring surface POM                                     |
| FMS 400 C                                                                          | Measuring surface ceramic                                 |
| FMS 400 T                                                                          | Measuring surface PTFE                                    |
| Housing                                                                            | Stainl. steel 1.4307                                      |
| Weight                                                                             | Approx. 1.050 g                                           |
| Protection class                                                                   | IP 67 according to EN 60529                               |
| Connection cable                                                                   | Shielded 4-wires cable,<br>0.25 up to 0.5 mm <sup>2</sup> |
| Cable length                                                                       | max. 1000 m with 0.75 mm <sup>2</sup>                     |
| Process-temp.                                                                      | -10° ~ 90° C<br>140°C with cooling                        |
| Storage temp.                                                                      | -10° ~ 80° C                                              |
| Response time                                                                      | Approx. 1 secont                                          |
| Power consumption                                                                  | 0.4 Watt                                                  |
| Signal                                                                             | RS 485                                                    |
| Pressure resistance                                                                | Up to 6 bar                                               |



## Humy 3019 Technical Data Measuring Unit

|                                |                                                                                                                                                                 |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction F                 | Field-/wall-mounting housing, B 265 x H 240 x T 250, weight approx. 6.500 g, with sight-door IP65                                                               |
| Construction T                 | Desk-housing B 236 x H 132 x T 330mm, weight approx. 4.500g, Option panel housing                                                                               |
| Construction E                 | 19"-plugin 3HE / 42 TE, weight approx. 2.000 g                                                                                                                  |
| Construction S                 | Panel housing with sight door<br>B270 x H183 x T223, IP 58                                                                                                      |
| Perm. temp.                    | -10° till + 60°C                                                                                                                                                |
| Storage temp.                  | -10° till + 70°C                                                                                                                                                |
| Perm. humidity while operation | 10% till 95% (without condensation)                                                                                                                             |
| Digital resolution             | 20 Bit for 0-85,0% moisture and 15 - 100% dry substance                                                                                                         |
| Measuring range temp.          | Span min.: 0-5° C, Span max.: 0-120° C                                                                                                                          |
| Handling                       | Via Software Hu-Config                                                                                                                                          |
| Accuracy                       | max. 0,02 % depending on the measured material                                                                                                                  |
| Averaging time                 | 0-999 sec.                                                                                                                                                      |
| Memory                         | User-memory for storage of parameters of 24 different products.                                                                                                 |
| Data logger                    | Storage of historical values up to 10 years. Real time clock for measurement record keeping.                                                                    |
| Relay output 2X                | Normally opened and normally closed contact for each Min- and Max-alarm relay<br>Contact load: 30VDC or 62.5 VAC                                                |
| Analog output 2X               | 0/4-20 mA with a max. load of 750 Ω or 0/2-10 V with a min. load of 50 kΩ<br>Measuring value of residual moisture /dehydrated substance and product temperature |
| Analog input                   | mA- and PT 100- input for additional compensation                                                                                                               |
| Digital output 2X              | Galvanic isolated, 24 V open-drain(max. 50mA)                                                                                                                   |
| Digital input 2X               | Galvanic isolated, active signals (8-36 V)                                                                                                                      |
| Interface                      | RS 232 (front socket connection to PC)<br>RS 485 (half-duplex)                                                                                                  |
| Power supply                   | 230 V AC / 115 V AC or 24 V AC/DC                                                                                                                               |
| Power consumption              | Max. 6W                                                                                                                                                         |



Construction F





## Humy 300 Technical Data Evaluation Unit

|                                |                                                                                                      |
|--------------------------------|------------------------------------------------------------------------------------------------------|
| Housing                        | DIN-Rail Mounting                                                                                    |
| Material                       | PBT                                                                                                  |
| Dimensions                     | 22.5 mm x 114.5 mm x 99.0 mm (without clamps)                                                        |
| Protection class               | IP20                                                                                                 |
| Accuracy                       | Better than 0.1% (depending on product)                                                              |
| Weight                         | 250 g                                                                                                |
| Perm. temp.                    | -10° ~ 60°C                                                                                          |
| Storage temp.                  | -10° ~ 60°C                                                                                          |
| Perm. humidity while operation | 10% ~ 95% (without condensation)                                                                     |
| Digital resolution             | 20 Bit for 0 - 85% moisture and 15 - 100% dry substance                                              |
| Measuring range moisture       | Min. 0,000 - 0,100%, max. 0,0 - 90%, with 1-,2- or 3 digits behind the point                         |
| Handling                       | Via Software Hu-Config                                                                               |
| Averaging                      | 0-999 sec.                                                                                           |
| Memory                         | User-memory for storage of parameters of 24 different products.                                      |
| Relay output                   | Nominally opened and nominally closed contact for max-alarm relay<br>Contact load: 30VDC or 62,5 VAC |
| Analog output                  | Measuring value of residual moisture or dehydrated substance 0/4-20 mA, load 500 Ω.                  |
| Digital input                  | 2x galvanic isolated, active signals (8-36 V)                                                        |
| Interface                      | USB-Interface for Hu-Config; RS 232 with connection for RxD, TxD, OV; RS 485                         |
| Software                       | Hu-Config (included)                                                                                 |
| Power supply                   | 24 V AC/DC                                                                                           |



# MF 3000

Mass flow measurement for bulk materials



## Function

Our solid flow meter MF 3000 is designed for flow measurement in metallic pipes from a few kg/h to many t/h. The system is suitable for on-line measurements of powders, dusts, pellets, and granules from 1 nm up to 2 cm in pneumatic or free fall conditions.

The measurement principle of the MF 3000 is based on the physical Doppler-Effect, whereas the sensor generates a uniform field in the microwave frequency range inside the pipe. These microwaves are being reflected by particles passing through the pipe. Calculation of frequency and amplitude changes allows for accurate determination of solid flow. Non-moving particles like dust accumulation are excluded from the calculation.

The installation is simple and cost effective via a welded branch, through which the sensor is screwed flush to the inside of the pipe. The sensor is connected to a DIN-rail mounted transmitter with 4...20 mA, RS232 and RS485 output. The calibration is easy by using our MF-SMART software and a reference flow value.

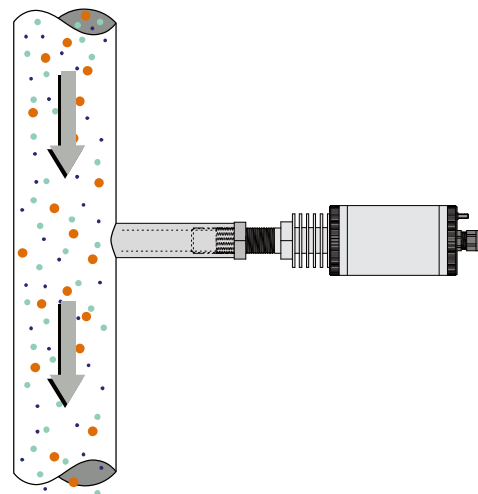
## Main Benefits

- For pneumatic conveyors and free falling processes
- For all solid materials from a few kg/h to many t/h
- No armatures inside the pipe and inside flush fitting
- Very fast and contactless measurement
- Easy, quick and cost effective installation and start-up
- Galvanic separated DIN-Rail Transmitter with RS232- and RS485-Interface
- Robust stainless steel version, abrasion and maintenance free
- Limit value monitoring with alarm contact
- Sensor-transmitter distance up to 2.000 m
- Easy and quick calibration
- Adjustable sensitivity
- Optional: ATEX for Zone 20 and Zone 2 ☹

## Putting into work

A branch is welded onto the pipe. A 18 mm hole is drilled, the sensor is mounted flush with the inner diameter of the pipe. For commissioning and calibration a notebook with our MF-SMART software needed.

Calibration can be performed with either one or multiple reference flow amounts. The measurement value is output either analog or as digital signal. A serial COM interface is available at the front of the transmitter to connect a notebook computer and a RS485 interface for connection to a PLC system.



## Application examples of successfully measured products

MF 3000 is measuring in pneumatic transportations and free falling processes. The product's grain size can be between 1 nm and 20mm.

The moisture of the measured material is allowed to be changed up to 12%

|                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Materials:</b></p> <p>All dust, powders, granulates, panels, threads etc. Also sticking or abrasive materials</p> <p><b>Industries:</b></p> <p>Animal feed industry<br/>         Building materials industry<br/>         Cement industry<br/>         Chemical industry<br/>         Detergent industry<br/>         Engineering companies<br/>         Food industry<br/>         Glass production<br/>         Metal production</p> | <p><b>Range of detection:</b></p> <p>from kg/h to many t/h</p> <p>Pharmaceuticals<br/>         Pigment production<br/>         Plastic industry<br/>         Production of ceramics<br/>         Production of rubber goods<br/>         Production of textiles<br/>         Tobacco industry<br/>         Washing powder industry</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Applications



Wood Dust



Jet Material



Plastic Granules



Coal Dust

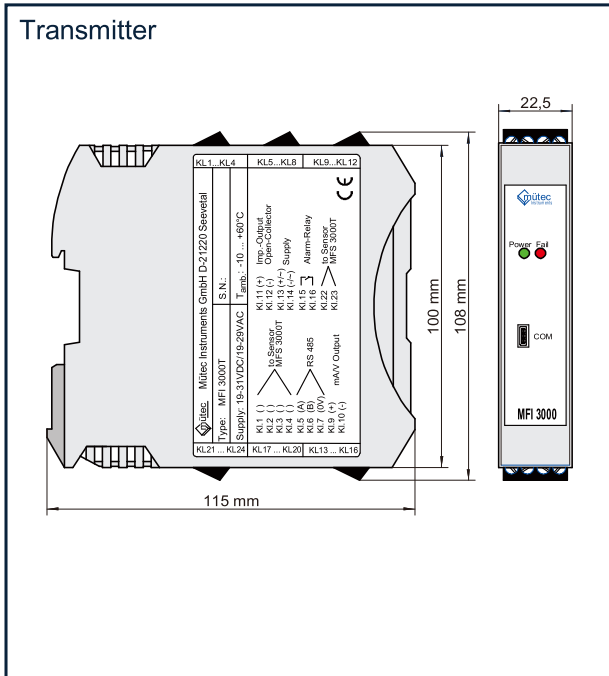
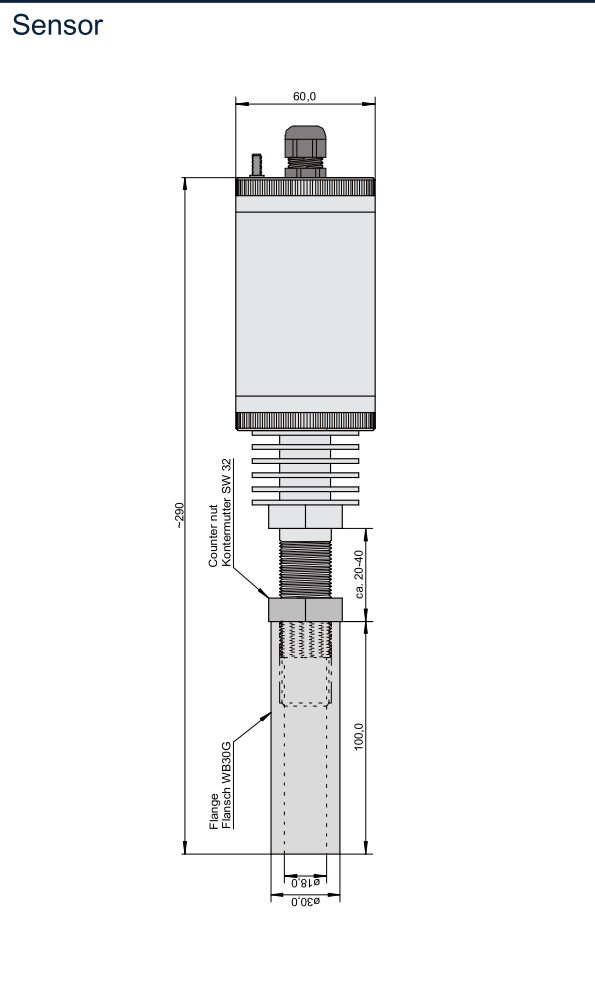
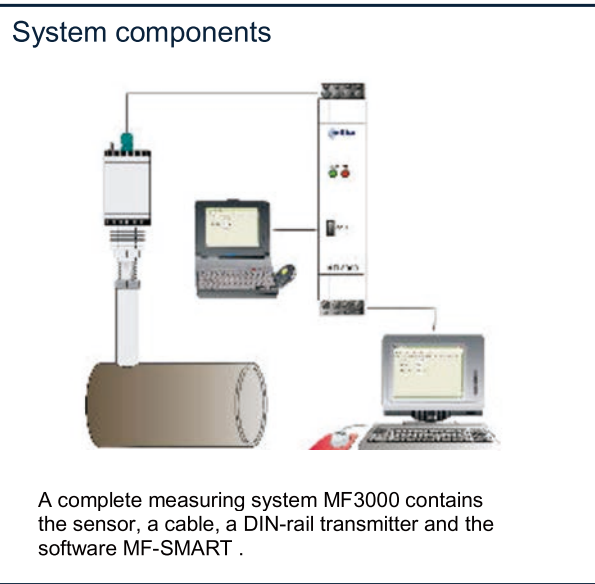


Fertilizer



Iron-II-Sulfate

| Process Data                          |                                        |
|---------------------------------------|----------------------------------------|
| <b>MF 3000</b>                        |                                        |
| Measurement start free fall :         | Ca. 1 kg/h                             |
| Measurement start pneumatic transport | Ca. 1 kg/h                             |
| Max. pipe diameter                    | DN 300                                 |
| Grain size                            | 1 Nanometer up to 20 mm                |
| Moisture                              | Depending on the product               |
| Pressure                              | Up to 6 bar (Option up to 30 bar)      |
| Process temperature                   | -20 up to +90°C (Option up to +750°C)  |
| Technical Data                        |                                        |
| <b>Sensor</b>                         |                                        |
| Medium touched parts                  | Stainl. steel 1.4307 and PA 6.6        |
| Process connecting                    | Welding flange                         |
| Housing material                      | Stainl. steel 1.4307 or ST52           |
| Protection class                      | IP 65                                  |
| Power supply                          | Via transmitter                        |
| Technical Data                        |                                        |
| <b>Transmitter</b>                    |                                        |
| Construction                          | DIN-Rail, 22,5 mm                      |
| Auxiliary energy                      | 24 V AC/DC                             |
| Power consumption                     | Max. 2W (+0,3 – 8,5W for thermocouple) |
| Ambient temperature                   | -10 to +60°C                           |
| Protection class                      | IP 30                                  |





## FS 510E

### Continuous flow monitoring for bulk materials



#### Application

The FlowSwitch 510M is monitoring the conveying stream of solids.

Failures and problems during the transport or feeding of powders, dust, pellets or granules can be detected early with this device. This helps prevent serious difficulties that can occur due to clogged piping, material loss, or other technical problems with the system.

#### Scope of Use

Animal feed industry  
Building materials industry  
Production of ceramics  
Chemical industry  
Detergent industry  
Food industry  
Glass production  
Metal production

Pharmaceuticals  
Pigment production  
Power plants  
Production of rubber goods  
Recycling industry  
Synthetic materials  
Production of textiles  
etc.

## Main Benefits

- Reliable, contactless microwave measurement
- For all bulk materials
- Monitors the mass flow in solid handling
- Adjustable sensitivity, damping, hysteresis and filter time
- Easy installation by compact form
- Process connection with welding nozzle

## Function

The measurement procedure of the FlowSwitch 510M is based on the physical principle of the Doppler-Effect.

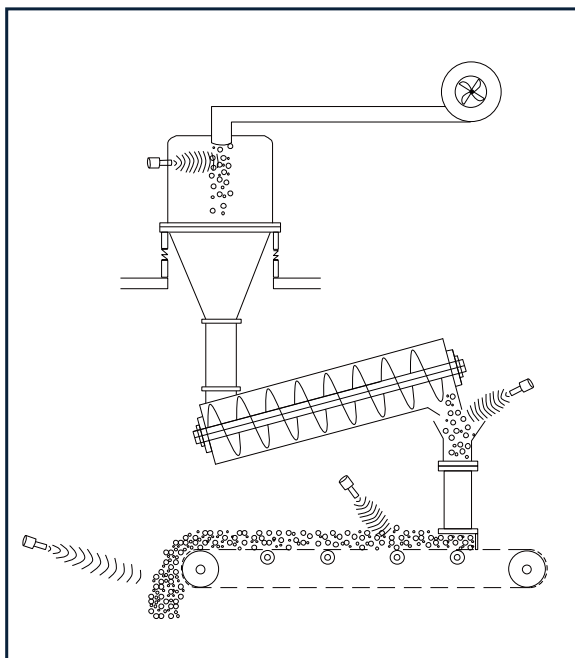
Therefore the sensor sends out a microwave field. If solids move through this field, the microwaves are reflected and received by the sensor again.

This is converted into a switching process.

All parameters, like sensitivity, damping, filter time and hysteresis are freely adjustable and, can be configured, due to the bargraph, with an exact value. This enables a variable determination of the switching point resp. a switching process for different mass flows.

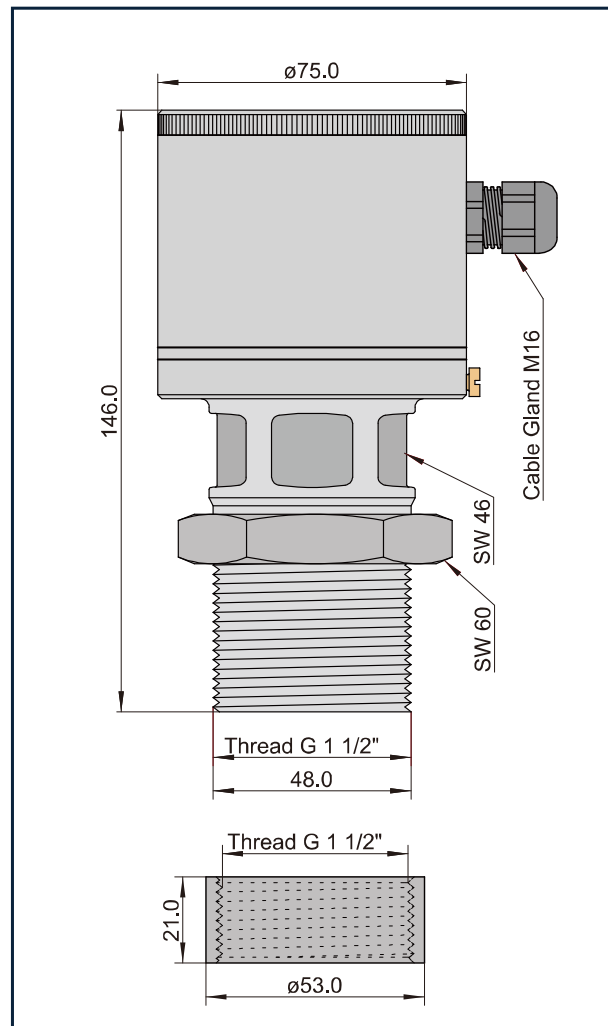
The installation can be carried out within pipes, on conveying belts, on fall plates, chutes or at similar transport facilities.

The assembly is simply, economical and easy also afterwards possible.



## Technical Data

|                      |                                                                               |
|----------------------|-------------------------------------------------------------------------------|
| Housing material     | Stainless steel                                                               |
| Sensor surface       | Teflon (optional ceramic)                                                     |
| Protection class     | IP65                                                                          |
| Ambient temperature  | -20°C to +60°C                                                                |
| Process temperature  | -20°C to +80°C                                                                |
| Process pressure     | 2 bar (optional 25 bar)                                                       |
| Power supply         | 24 VDC (18 - 30 VDC)                                                          |
| Current consumption  | Ca. 80 mA at 24 VDC                                                           |
| Transmitting power   | 10 dBm                                                                        |
| Output (switching)   | Relay contact (change-over contact, potential free)                           |
| Switching voltage    | 35 VAC or 45 VDC                                                              |
| Switching current    | min. 10 µA & max. 1 A                                                         |
| Switching power      | 35 VA or 30 W                                                                 |
| Electr. connection   | Plug-in screw terminals                                                       |
| Adjustable parameter | Sensitivity, damping, filter, hysteresis, min / max switch                    |
| Parameterization     | Direct at device via buttons                                                  |
| Indicators           | LED green (working)<br>LED yellow (switch)<br>Bargraph (i.a. field intensity) |



# FS 700E

## Dust monitoring for filter break



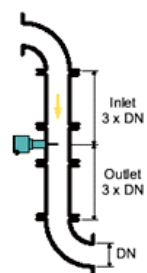
### Application

The dust monitor FlowSwitch 700E is used for the detection of filter failure functions e.g. crack or defect in assembling.

By the triboelectric measuring principle a dust breakthrough can be recognized reliable.

### Scope of Use

FlowSwitch 700E can be put in metallic pipes and channels which shall be monitored on dust.



## Main Benefits

- Maintenance free
- Adjustable sensitivity
- Adjustable switch
- Condition indication with LED
- Stainless steel housing
- Compact form
- Easy installation

## Function

The technology is based on a modified triboelectric principle detecting particles interacting with the sensing rod and such particles just passing the rod. Build up on the rod surface will not be detected, only moving particles generate a flow rate proportional signal which is monitored by the electronic.

Installation is done on the clean gas side downstream the filter at a metal duct by welding on of a thread bush boring through the duct wall and screwing in dust watch. On and off distance should be this 3-fold of the pipe diameter area, the sensor length 1/3 to 2/3 of the pipe diameter.

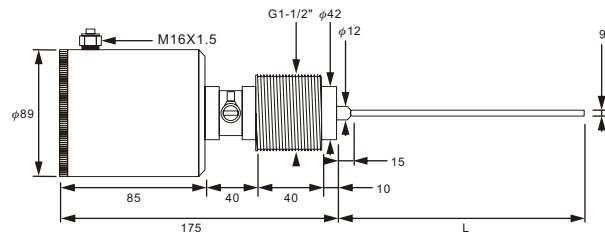
The device isn't usable at products, which build an electric conductive coating between sensing rod and pipe wall, caused of abrasion.

## Technical Data

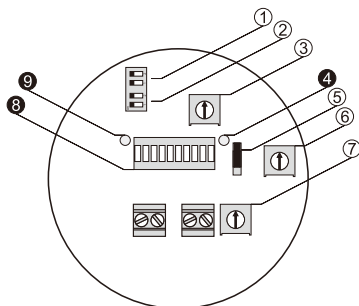
|              |                       |                                                      |
|--------------|-----------------------|------------------------------------------------------|
| Material     | Housing               | Stainl. Steel 1.4571                                 |
|              | Sensor rod (standard) | Stainl. Steel 1.4571                                 |
| Ambient cond | Isolation (standard)  | Polyamide (PA)                                       |
|              | Sealing (standard)    | NBR                                                  |
|              | temperature           | -20°C to +70°C                                       |
| Process      | Protection class      | IP 67 (EN 60529)                                     |
|              | EMC                   | According to EN 61326-1                              |
| Output       | Temperature           | Max. 90°C                                            |
|              | Pressure              | Max. 2 bar                                           |
| Power supply | FlowSwitch_01         | Max. 48 V AC/DC, 1A                                  |
|              | FlowSwitch_02         | Logic high/low switchable                            |
|              | FlowSwitch_20         | Transistor: galvanic isolated                        |
| Adjustment   | Max. 31 V DC, 15 mA   | Logic high/low switchable                            |
|              | FlowSwitch_01/02      | 4-20 mA, galvanic isolated, load < 500               |
| Adjustment   | FlowSwitch_20         | 17...31 V DC, max. 60mA., 24 V DC ± 10 %, max. 80 mA |
|              | Sensitivity           | 1...180.000                                          |
| Adjustment   | Damping               | 0...10 s                                             |
|              | Switchpoint           | 1...10                                               |
| Adjustment   | Zero set              | FlowSWITCH_01/02                                     |
|              |                       | 4 mA, FlowSWITCH_GM20                                |

## Dimensions

(Unit: : mm)

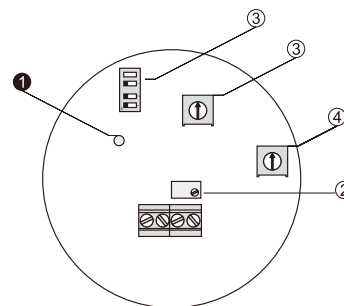


### Indication/ Adjustment elements of output type 01 and 02



- |                     |                       |                    |  |
|---------------------|-----------------------|--------------------|--|
| Adjustment elements |                       | Indicator elements |  |
| ① sensitivity 1     | ⑤ switching behaviour | ④ alarm            |  |
| ② sensitivity 2     | ⑥ damping             | ⑧ flow rate        |  |
| ③ sensitivity 3     | ⑦ limit value level   | ⑨ power            |  |

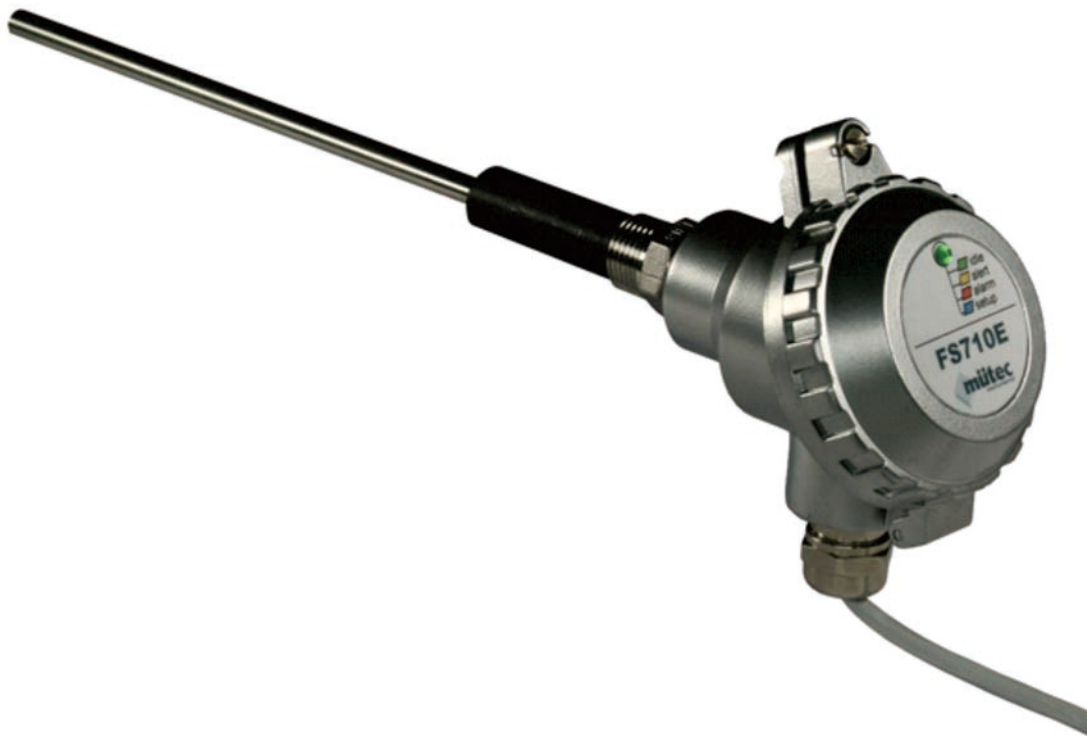
### Indication/ Adjustment elements of output type 20



- |                    |  |                     |  |
|--------------------|--|---------------------|--|
| Indicator elements |  | Adjustment elements |  |
| ① power            |  | ② zero adjustment   |  |
|                    |  | ③ span adjustment   |  |
|                    |  | ④ damping           |  |

# FS 710E

## Dust monitoring for filter break

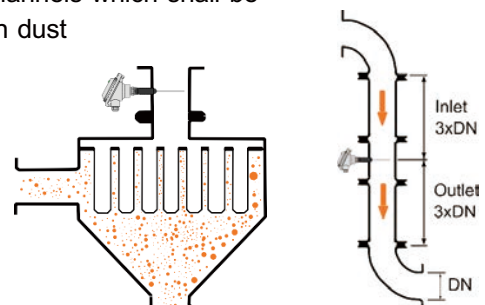


### Application

The dust indicator FS710E is for the use on the clean air side to detect dust behind a filter. In this way, filter cracks, fractures or assembly errors are reported automatically and reliably.

### Scope of Use

FlowSwitch 710E can be put in metallic pipes and channels which shall be monitored on dust





## Function

The measurement system is based on the triboelectric effect: Particles collide permanently with each other or with other materials, e.g. the wall. Because of this process the particles will be charged in a natural way. If these electrically charged particles are flying next to the sensor rod of FS710E or even touch it, the particles are detected via the charge transfer. Resting particles, such as deposits etc., do not affect the measurement. Therefore a subsequent installation into existing exhaust ducts is possible without any problems.

Installation is quick and easy by welding a threaded socket. The sensor rod is inserted into the pipe and fixed by the thread. The sensor rod length should be at least 1/3 of the pipe diameter and must not touch the opposite side.

During operation, the emerging particle load is continuously gathered and classified in three different categories.

|                  | Particle | Status   | LED    | Switch | Switch |
|------------------|----------|----------|--------|--------|--------|
| Load             | low      | good     | green  | closed | closed |
| Load             | medium   | prealarm | yellow | opened | closed |
| Category II Load | high     | main     | red    | closed | opened |

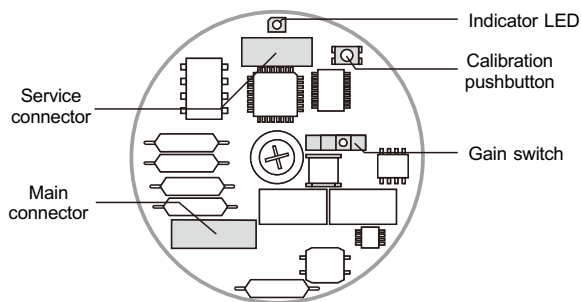


Figure 1 - View of board

|       |  |                    |
|-------|--|--------------------|
| GN    |  | Calibration (IN)   |
| GN-WH |  | Calibration (GND)  |
| OG    |  | Supply (+24V)      |
| OG-WH |  | Supply (0V)        |
| BU    |  | Solid state relay1 |
| BU-WH |  | Solid state relay1 |
| BN    |  | Solid state relay2 |
| BN-WH |  | Solid state relay2 |

Figure 3 - Wiring

## Main Benefits

- Automatic calibration
- Maintenance free
- Three-condition monitoring
- Two switching points via switching output
- Condition indication by different LED colors
- Compact form
- Protection class IP65
- Easy installation

## Technical Data

|               |                                              |                         |
|---------------|----------------------------------------------|-------------------------|
| Material      | Housing                                      | Aluminium               |
|               | Sensor rod (standard)                        | 316Ti                   |
|               | Protection class                             | IP 65 (EN 60529)        |
|               | Isolation (standard)                         | PPS                     |
| Process cond. | Temperature                                  | -20°C to +150°C         |
|               | Pressure                                     | 0 to 2 bar              |
| Power supply  | Voltage                                      | 24 VDC                  |
|               | Power consumption                            | max. 50 mA              |
|               | Power                                        | < 2 W                   |
|               | Storage                                      | -20°C to +60°C          |
|               | EMC                                          | According to EN 61326-1 |
| Output        | Switch1 and switch2                          |                         |
|               | Switch output                                | Normally energized      |
|               | Switching voltage                            | 60 VAC/DC               |
|               | Switching current                            | Max. 100 mA             |
|               | Switching capacity                           | 6 W                     |
| Calibration   | Precalibration and automatical recalibration |                         |
| Other         | Ambient Temp.                                | -20°C to +50°C*         |
|               | Storage Temp.                                | -20°C to +70°C          |
|               | Cable                                        | assembled               |

## Dimensions

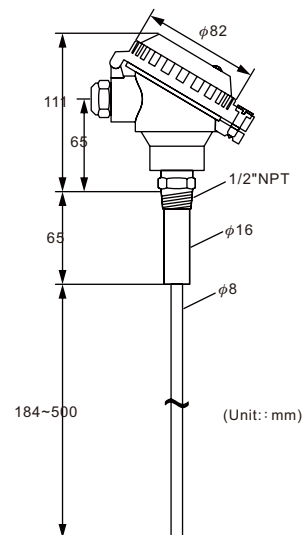


Figure 2 - Dimensions of sensor

# LC 510M

## Contactless level monitoring for bulk material



### Application

The microwave barrier LevelCheck 510M is designed for level monitoring of solids in silos, container, bunkers, shafts, etc.

Furthermore it can be used for: blockage-report, for counting piece goods or for positioning items. The devices are certified up to ATEX Zone 20 and optionally authorized for a process pressure up to 25 bar.

### Scope of Use

|                             |                            |
|-----------------------------|----------------------------|
| Animal feed industry        | Pharmaceuticals            |
| Building materials industry | Pigment production         |
| Production of ceramics      | Power plants               |
| Chemical industry           | Production of rubber goods |
| Detergent industry          | Recycling industry         |
| Food industry               | Synthetic materials        |
| Glass production            | Production of textiles     |
| Metal production            | Etc.                       |

## Main Benefits

- Reliable, contactless microwave measurement
- For all bulk materials
- Monitors the mass flow in solid handling
- Adjustable sensitivity, damping, hysteresis and filter time
- Easy installation by compact form
- Process connection with welding nozzle

## Function

The measurement procedure of the FlowSwitch 510M is based on the physical principle of the Doppler-Effect.

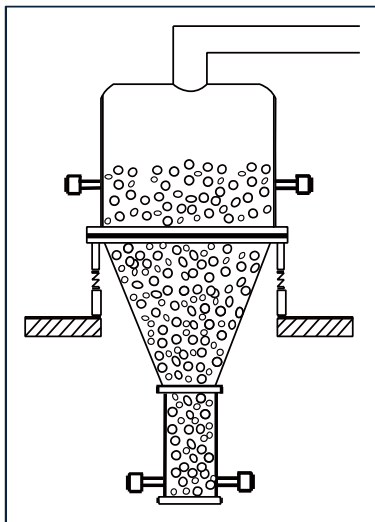
Therefore the sensor sends out a microwave field. If solids move through this field, the microwaves are reflected and received by the sensor again.

This is converted into a switching process.

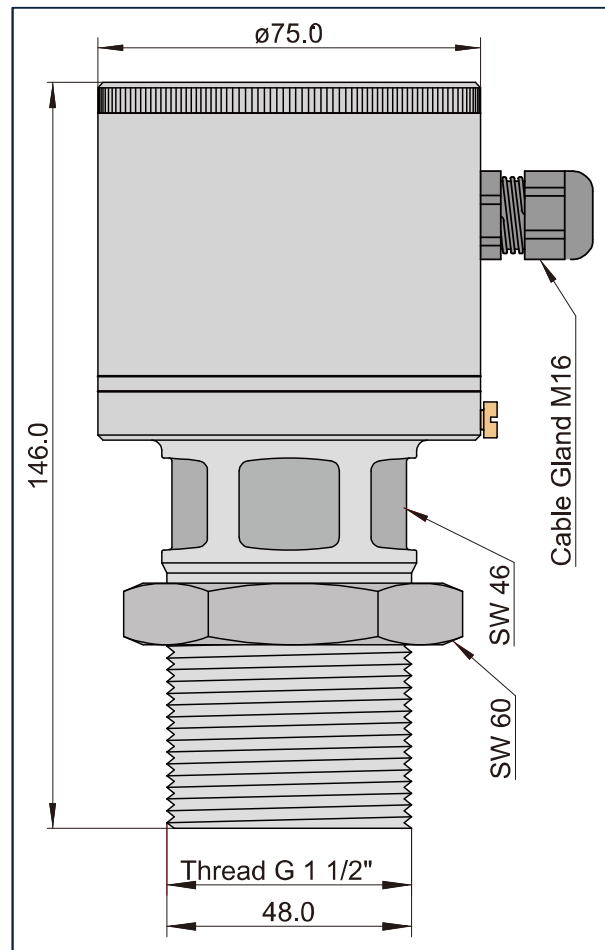
All parameters, like sensitivity, damping, filter time and hysteresis are freely adjustable and, can be configured, due to the bargraph, with an exact value. This enables a variable determination of the switching point resp. a switching process for different mass flows.

The installation can be carried out within pipes, on conveying belts, on fall plates, chutes or at similar transport facilities.

The assembly is simply, economical and easy also afterwards possible.



| Technical Data        |                                                                            |
|-----------------------|----------------------------------------------------------------------------|
| Housing material      | Stainless steel                                                            |
| Sensor surface        | Teflon (optional ceramic)                                                  |
| Protection class      | IP65                                                                       |
| Ambient temperature   | -20°C till +60°C                                                           |
| Process temperature   | -20°C till +80°C                                                           |
| Process pressure      | 2 bar (optional 25 bar)                                                    |
| Power supply          | 18-30 VDC (typical 24 VDC)                                                 |
| Current consumption   | Ca. 80 mA at 24 VDC                                                        |
| Transmitting power    | 10 dBm                                                                     |
| Output (switching)    | 2x Relay output<br>(change-over contact, pot.-free)<br>optional transistor |
| Switching voltage     | 45 VDC / 35 VAC                                                            |
| Switching current     | Min. 10 µA & max. 1 A                                                      |
| Switching power       | 30W / 35 VA                                                                |
| Electr. connection    | Screw terminals<br>(behind a screw cap with cable gland)                   |
| Adjustable parameters | Sensitivity, filter time,<br>hysteresis                                    |
| Parameterization      | via key buttons and switch                                                 |
| Indicators            | LED green (power supply)<br>LED orange (switch)<br>Bargraph                |



## ORDER INFORMATION

### HUMY3000 ORDER INFORMATION

**HUM 1**     -

**HUMY3000** \_\_\_\_\_

**Model** \_\_\_\_\_  
 00: Standard type      02: Hi-temp. type

**Certification** \_\_\_\_\_  
 00: N/A      B: ATEX-Ex ia      1C: ATEX-Ex d

**Probe material** \_\_\_\_\_  
 17: POM (Standard)      21: PTFE      32: Ceramic

**Cable length** \_\_\_\_\_  
 0003: 3 mtr (Standard)  
 0004: 4 mtr  
 0005: 5 mtr  
 ⋮  
 1000: 1000 mtr (Max.)

**Sensor housing** \_\_\_\_\_  
 A: 304L (Standard)      B: 316Ti

**Console** \_\_\_\_\_  
 E: Cabinet type      T: Desktop type      : Wall mounting type

**Power supply** \_\_\_\_\_  
 F: AC110V(AC110V+DC24V)  
 G: AC220V(AC220V+ DC24V)

### HUMY3019 ORDER INFORMATION

**HUM 2**   **00** -

**HUMY3019** \_\_\_\_\_

**Model** \_\_\_\_\_  
 00: Standard type      02: Hi-temp. type

**Probe material** \_\_\_\_\_  
 17: POM (Standard)      21: PTFE      32: Ceramic

**Cable length** \_\_\_\_\_  
 0003: 3 mtr (Standard)  
 0004: 4 mtr  
 0005: 5 mtr  
 ⋮  
 1000: 1000 mtr (Max.)

**Sensor housing** \_\_\_\_\_  
 A: 304L (Standard)      B: 316Ti

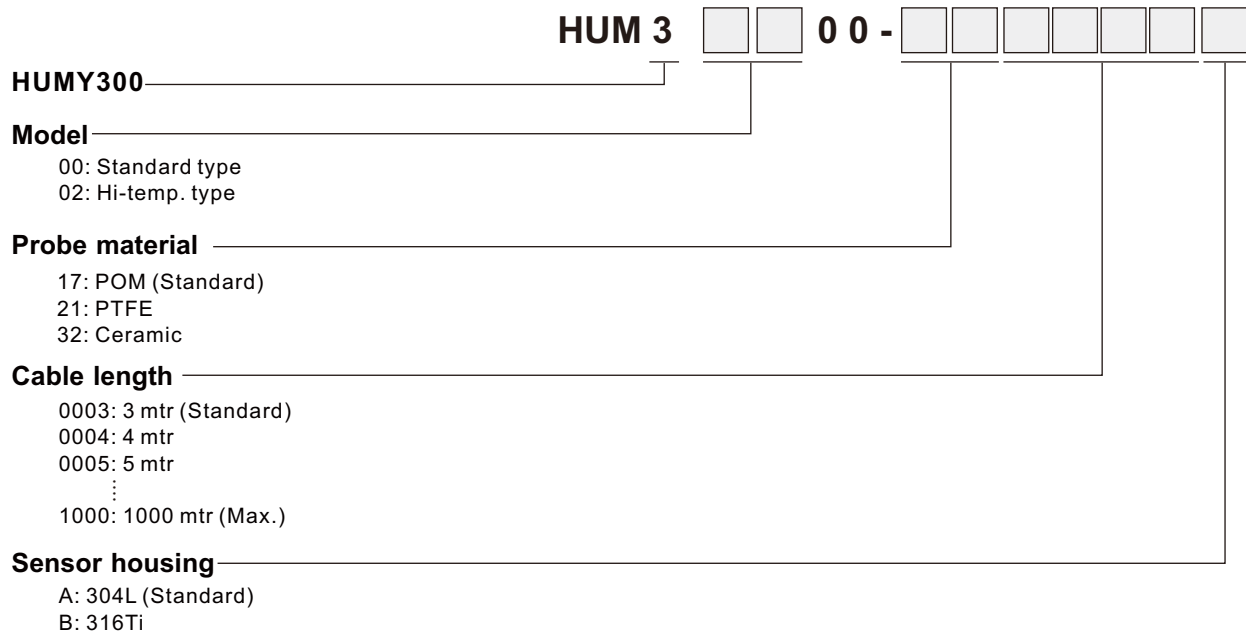
**Mounting case** \_\_\_\_\_  
 0: N/A      3: HUMY 3019-3-TR      6: HUMY 3019-6-TR

**Plate Q'ty for controller** \_\_\_\_\_  
 00: N/A  
 01: 1 pc  
 ⋮  
 10: 10 pcs

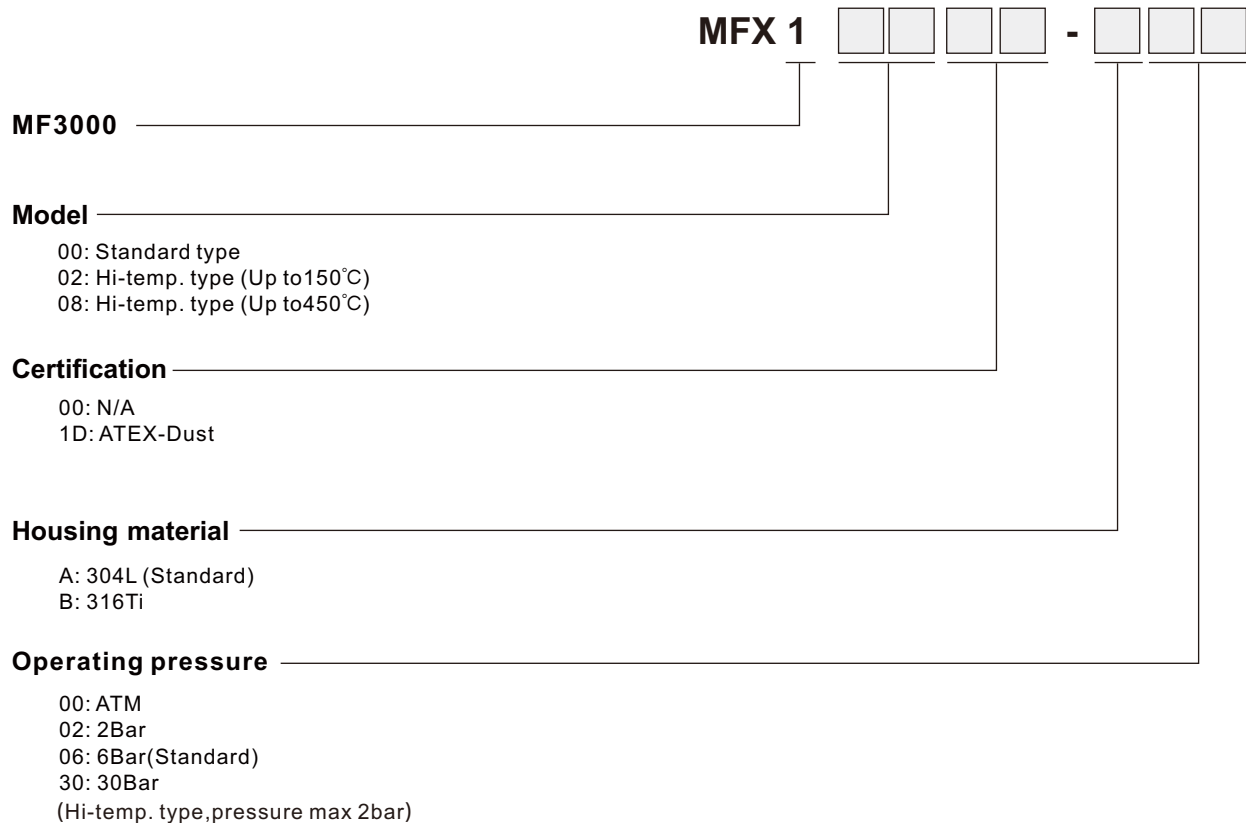
**Power supply** \_\_\_\_\_  
 F: AC110V(AC110V+DC24V)  
 G: AC220V(AC220V+ DC24V)

## ORDER INFORMATION

### HUMY300 ORDER INFORMATION



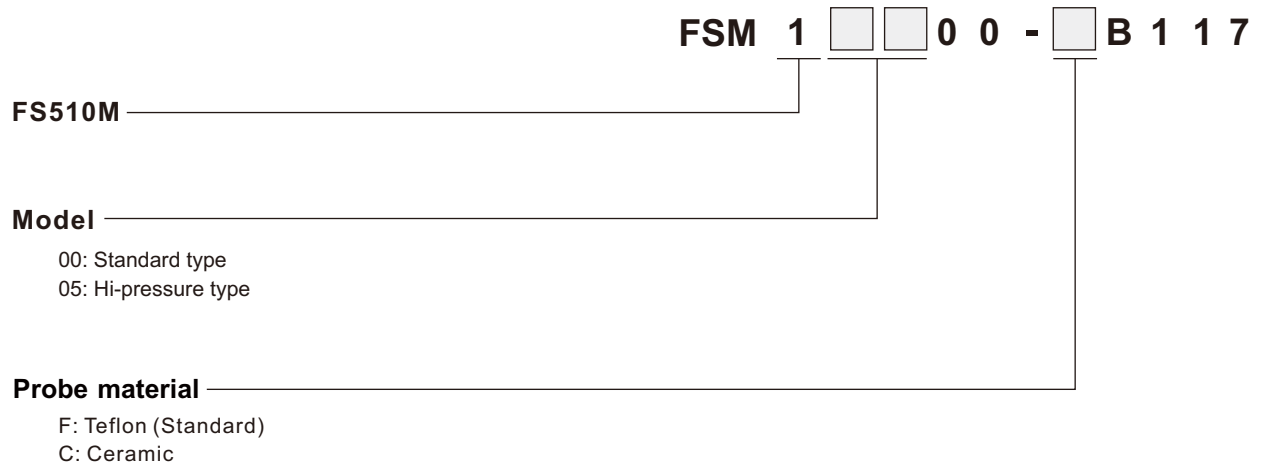
### MF3000 ORDER INFORMATION



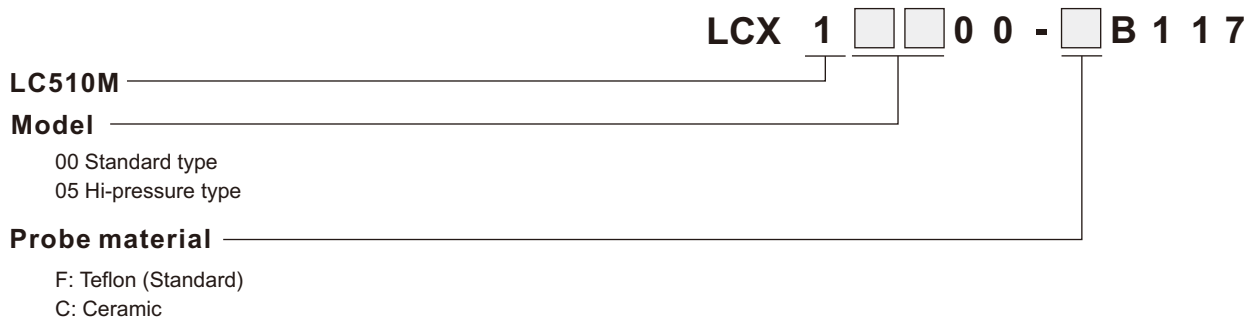


## ORDER INFORMATION

### FS510M ORDER INFORMATION

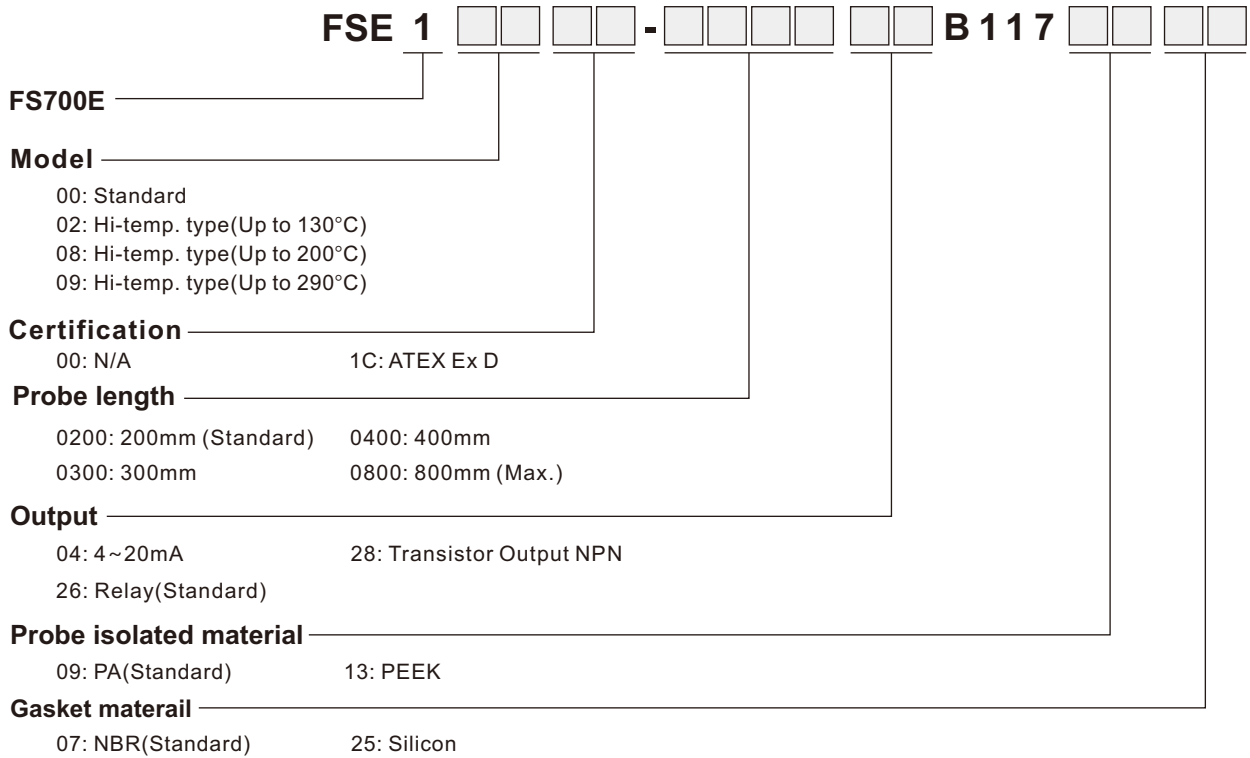


### LC510M ORDER INFORMATION

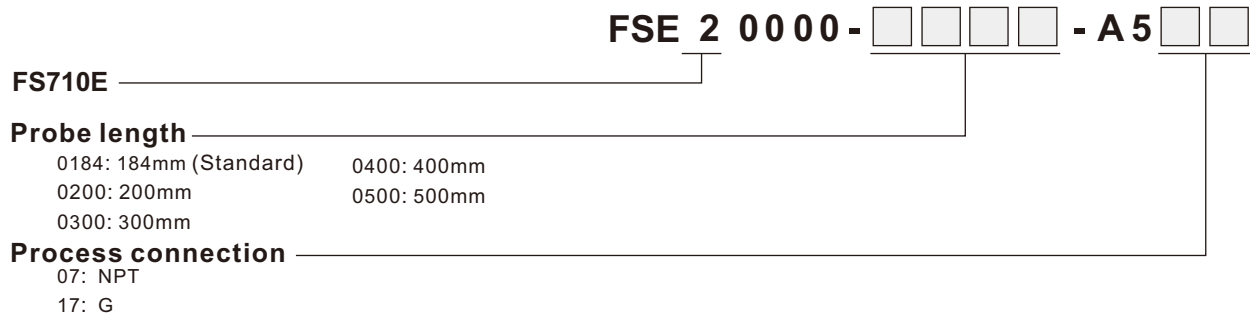


## ORDER INFORMATION

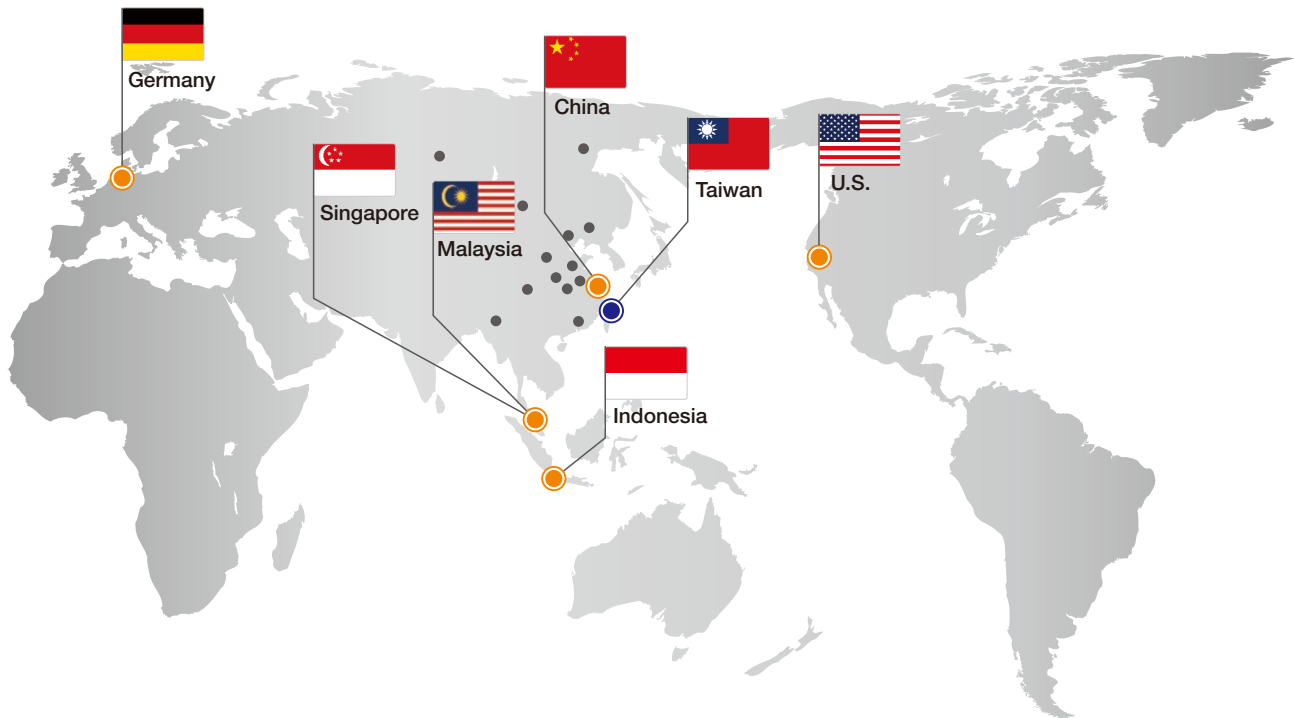
### FS700 ORDER INFORMATION



### FS710E ORDER INFORMATION



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