



INDUSTRY ► LEVEL

FMM20

DESCRIPTION



The FMM20 electromechanical level works independently of physical properties such as density.

It allows the level to be measured in bunkers or silos with powdered or fine grain bulk solids or in vessels containing liquids.

Separation layer detection in liquids is also possible when using suitable sensing weights.

Your benefits:

- Suitable for process conditions in which classic ultrasonic or radar level gauges do not work reliably
- Precise detection of the level (accuracy of ±2.5 cm or ±1 pulse)
- Compact device with 0/4 20 mA current output as well as further free programmable signal outputs (for example counter pulse)
- Quick menu-guided local operation using a 4-line text display
- Fully electronic digital minimum fail-safe control, therefore no running down of the sensor weight into the silo outlet and no risk to the conveying systems

- Measuring range: Max. 42 m
- Protection (according to EN 60529):
 - With closed enclosure IP67
 - With closed enclosure and with the use of the external start button IP65
 - With open housing IP20
- Supply voltage:
 - 90 to 253 V AC, 50/60 Hz
 - 20 to 28 V DC
- Output signals:
 - Current output 0/4 to 20 mA (active, 0 to 20 mA / 4 to 20 mA programmable)
 - Relay outputs (2, optional 4) max. 250 V AC / 6 A
 - Programmable relay output functions:
 - Counter pulse
 - Reset pulse
 - Running up
 - Top position
 - Measuring
 - Alarm
 - Service interval
- Input signals:
 - Active (input voltage range 12 to 24 V DC)
 - Passive
- Process connection: Flange DN100 PN16 (hole sizes as per EN 1092-1)
- Process temperature: Max. -20 to +150 °C
- Process pressure:
 Max. 0.8 to 1.1 bar (12 to 16 psi)
 absolute
- Weight: 11 to 17 kg (depends on the selected type of device, without sensing weight)
- Approval: ATEX



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ORDER CODE

10	Approval
	Ex-free area
В	ATEX II 1/2D Ex ta/tb IIIC T99°C Da/Db ATEX II 2D Ex tb IIIC T99°C Db
	ATEX II 2D Ex tb IIIC T99°C Db
Υ	Special version, to be specified

20	Housing
	Aluminum
	Aluminum, coated
9	Special version, to be specified

30	Measuring range
4	15 m, stainless steel (301, modified)
5	32 m, stainless steel (301, modified)
8	42 m, stainless steel (301, modified)
7	8 m, Plastic (PE, PP coated)
9	Special version, to be specified

40	Max. nozzle height; tape wiper						
Α	230 mm, aluminum/steel						
В	230 mm, stainless steel						
С	500 mm, aluminum/steel						
D	500 mm, stainless steel						
Ε	1000 mm, aluminum/steel						
F	1000 mm, stainless steel						
Υ	Special version, to be specified						

50	Supply voltage
1	90 to 253 V AC, 50/60 Hz
3	20 to 28 V DC
9	Special version, to be specified

	Output
Α	0/4 to 20 mA + 2x relay, adjustable
С	0/4 to 20 mA + 4x relay, adjustable
Υ	Special version, to be specified

70	Ambient temperature
	-20 to +60 °C
Ε	-40 to +60 °C + heater
F	-20 to +60 °C + extended climate resistance
G	-40 to +60 °C + extended climate resistance + heater
Υ	Special version, to be specified

80	Process temperature
1	-20 to +70 °C
2	-20 to +150 °C
9	Special version, to be specified

90	Sensing weight
Α	Without
В	Steel
С	Stainless steel
D	Steel + umbrella
E	Stainless steel + umbrella
G	Medium bag
N	Plastic
Р	Plastic + spike
Х	Float (316Ti)
Υ	Special version, to be specified

100	Additional equipment
	Basic version
2	Sight glass + start button (external)
	Special version, to be specified

Additional accessories such as adapter flanges, process adapters, sensing weights and weather protection cover → Technical Information ti048000en

Complete order code	10	20	30	40	50	60	70	80	90	100
FMM20										

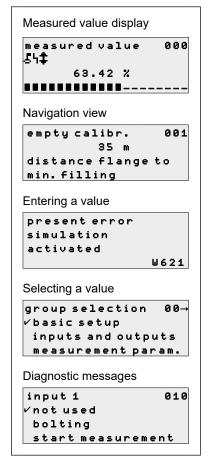


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FEATURES

- Operator-oriented menu structure for user-specific tasks:
 Commissioning, Operation, Diagnostics, Expert level
- Quick and safe commissioning:
 Menu guidance with brief explanations of the individual parameter functions
- Reliable operation:
 - Operation in the following languages: English, German, French, Japanese
 - Other operating languages can be ordered optionally (product configurator)
 - · Help texts in the selected language
- Efficient diagnostics increase measurement availability:
 - · Display of the current and the previous error
 - · Help texts for every occuring error
 - Various simulation options
- The parameterization is stored internally and is retained even after the supply voltage is removed. No operation is required while the device is working. Adaptation to the application must only be carried out during initial installation. However, subsequent changes can be made and saved at any time.
- Further operating elements:
 - Local operation (parameterization) with 3 push buttons: \Box , $\dot{\Box}$, $\dot{\Box}$
 - Local operation (start measuring) with one push button, optional with external start button, ordering code "additional equipment", option 2



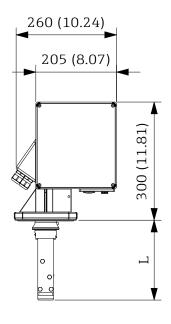
- The measuring device is a compact transmitter with integrated microprocessor-controlled electronics, various in- and outputs are provided. The device can be adapted to different applications by choosing one of the suitable sensing weights.
 - Type of housing and materials: Compact, Aluminium, optional coated
 - · Sensing weights and materials:
 - Steel, optional with umbrella made of Polvester
 - Stainless steel 316TI, optional with umbrella made of Polyester
 - Medium bag made of Polyester
 - Plastic (PVC), optional with spike made of stainless steel 316Ti (1.4571)
 - Oval float made of stainless steel 316Ti (1.4571)
 - Variants for separation layer detection as accessories
- The FMM works according to a simple measuring principle:
 - 1. When a measurement starts (manually or automatically), a sensing weight is lowered by a motor and spring action causes the wiper to be moved slightly out of its end position. As the weight is lowered, the measuring tape passes over a counting wheel which sends a pulse to the electronics every 2.5 cm.
 - 2. When it hits the medium, the freely oscillating motor tilts from its working position, in which it is held by the weight of the sensing weight, to its rest position. This is detected by the electronics and the motor is switched off.
 - 3. The sensing weight is pulled up again and counter pulses are detected once more.
 - 4. As soon as the sensing weight reaches the measuring device, it causes the wiper to move to its top position which is detected by the electronics.
 - 5. The motor is switched off, the measuring cycle is ended and the measured value, which depends on the configuration, is put out:
 - Display value on the LC display
 - Current value at the 4-20 mA current output
 - Relay switching (e.g. for the "top position" or "measuring" function)

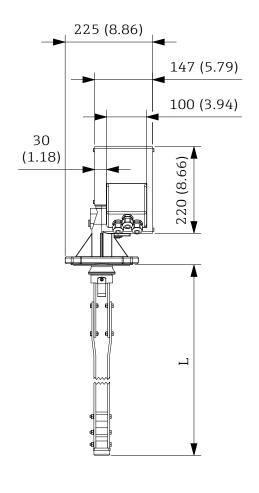


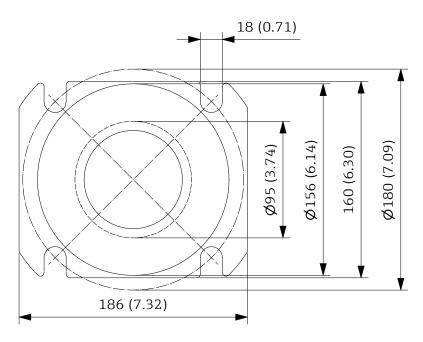
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DIMENSIONS







The wiper length (\mathbf{L}) depends on the selected maximum nozzle height:

- 225 mm (8.86 in), Ordering code "maximum connection height; wiper", option A or B
- 515 mm (20.28 in), Ordering code "maximum connection height; wiper", option C or D
- 1015 mm (39.96 in), Ordering code "maximum connection height; wiper", option E or F