

Siemens nye flowmåler FMT020/FMS500



Dagens vært

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Agenda

SITRANS FMT020/FMS500

- Nye funktioner
- Opbygning / koncept
- Releaseplan
- Communication
- Display and Menu struktur
- Indbygningsforhold

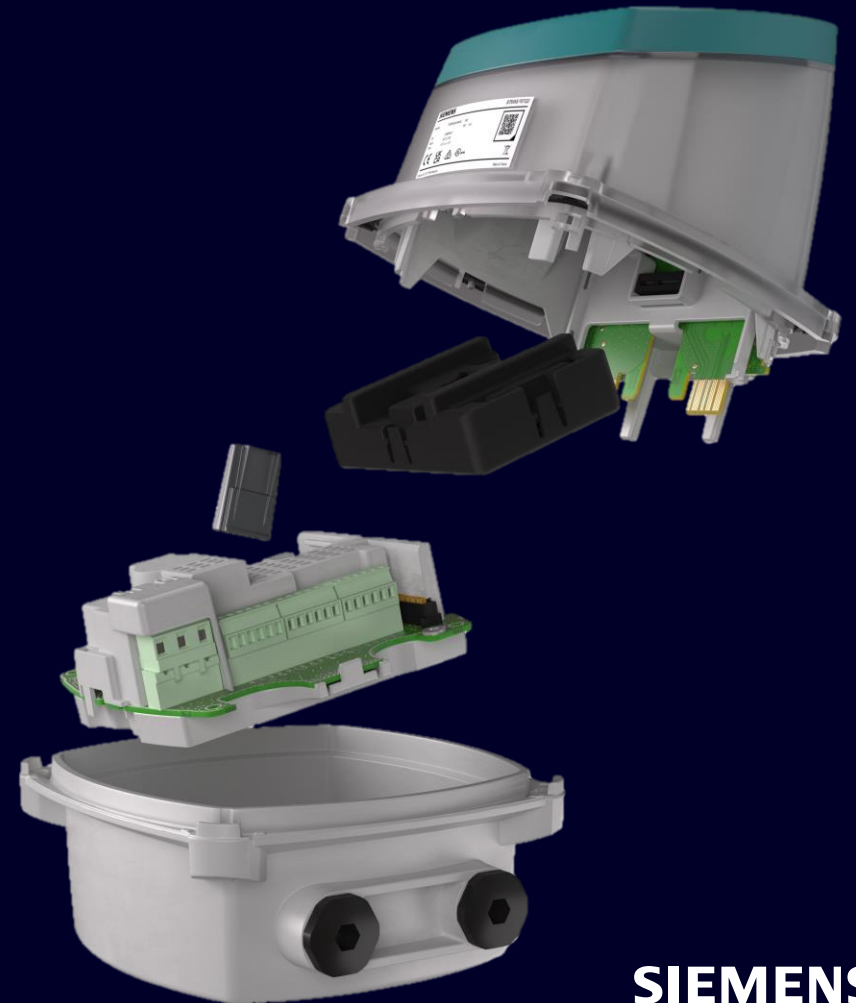
Fordele ved velkendt Mag5000/6000 er bibeholdt, og nye er kommet til

Unchanged advantages:

- The **Modularity** of the FMT020 is unchanged:
 - Compact-Remote free to decide during installation
- The **Sensorprom Technology** remains the biggest asset

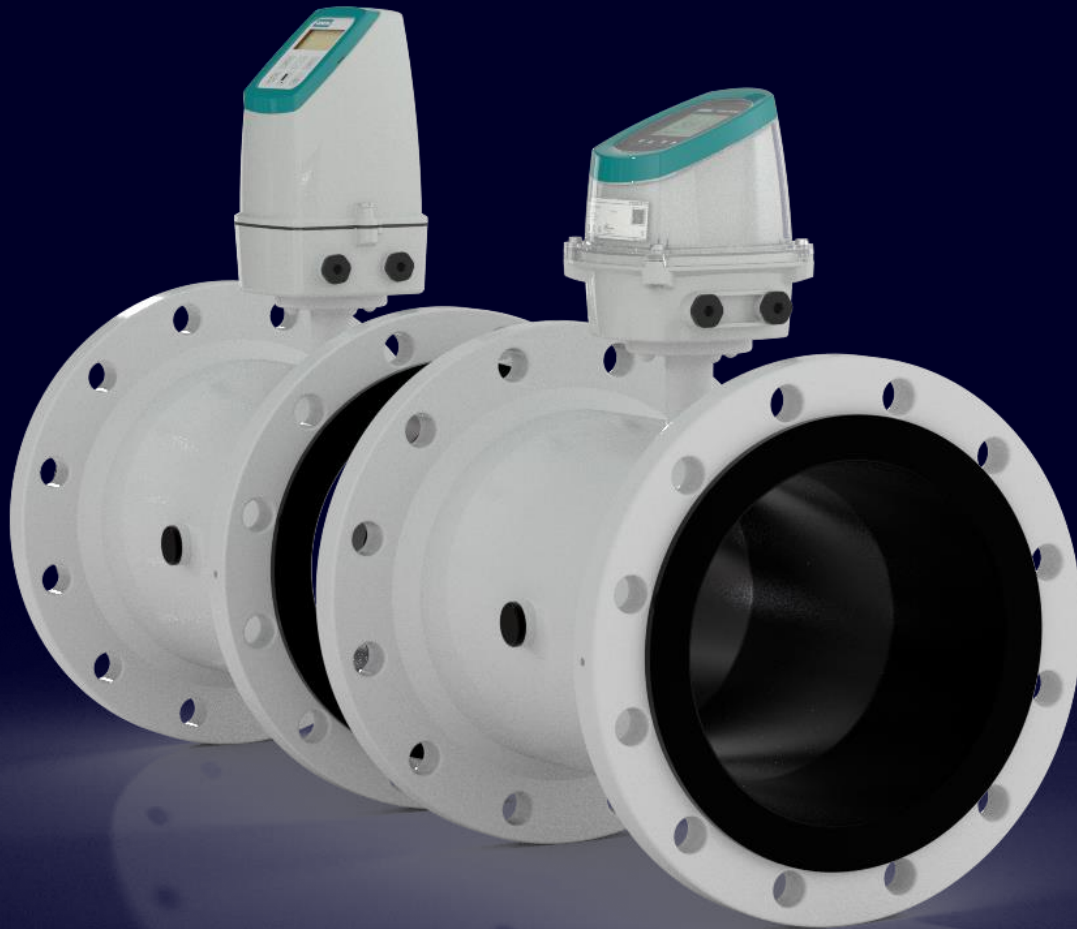
New:

- Full graphical Display with 14 digits, Capacitive keypads
- Reduced height, compact design
- Ethernet IP, Profinet communication module
- Measuring conductivity
- Log data via micro-SD memory card
- Temperature spec. down to -40°C
- Robust Enclosure
- Bluetooth (available later)
- MI001, MI004, OIML R 49 Class ½ (available later)
- EX zone 2 approvals: ATEX, FM/CSA, Nepsi, IEC (available later)
- IP68 in remote: 2m – 10 days when unpotted, 10m continuously potted



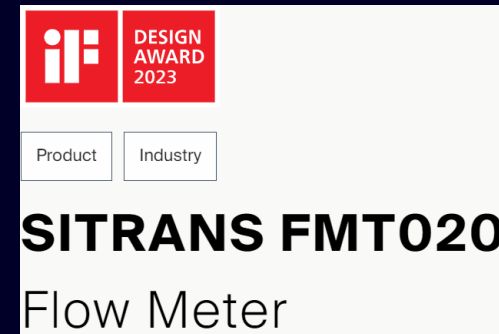
From SITRANS MAG 5000 / 6000 to SITRANS FMT020

Going beyond than a successor



Sitrans FMT020 offers:

- Lower design
- Modern shape, award winning
- Additional certifications
- More communication protocols
- High degree of flexibility
- Backward compatibility





ENVIRONMENTAL PRODUCT DECLARATION

SITRANS FM520 DN100 7ME6532-3TC12-1GA3-Z

Type II according to ISO 14021 including life cycle impact assessment (LCIA)

Climate change – total	kg CO2 eq
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Climate change – fossil	kg CO2 eq
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Climate change – biogenic	kg CO2 eq
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General information

This environmental product declaration (EPD) is based on the international standard ISO 14021 ("Environmental labels and declarations – Self declared environmental claims – Type II"). The data in this EPD has been evaluated on a full-scale life cycle assessment (LCA) study according to ISO 14040/44, taking into account the product category rules (PCR) for electronic and electrotechnical products and systems defined in EN 50693.

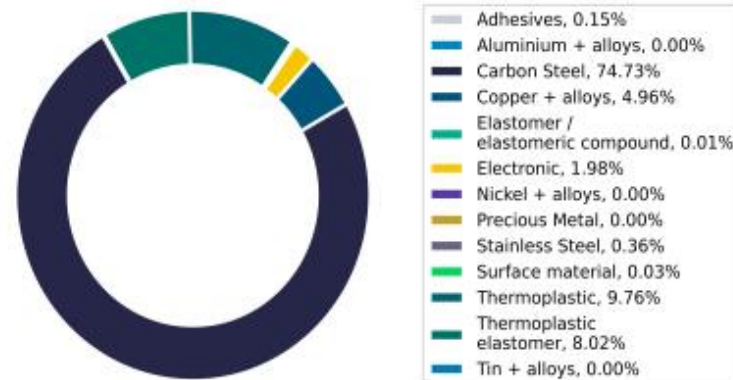
Siemens is dedicated to an environmentally conscious design of its products in line with IEC 62430 and has implemented an integrated management system according to ISO 9001, ISO 14001 and ISO 45001.

Products	7ME653(A)-(BB)(C)(D)(E)-1(F)A(G)-Z (A=0,2); (BB=3F,3M,4B,4H,4P,4V,5B); (C=A...W); (D=0,1); (E=2,3); (F=A,G,J); (G=0,2,3)
Represented by	7ME6532-3TC12-1GA3-Z A00
Product Description	Electromagnetic flow meter, flanged, diameter DN 15 to DN 1200 (1/2" to 48"). Suitable for volume flow measurement of liquids (conductive), for applications in water abstraction, water & wastewater treatment, water distribution networks, custody transfer metering.
Functional Unit	Production of 1 SITRANS FM520 DN100 and use over the reference service lifetime of 10 years.

Material composition

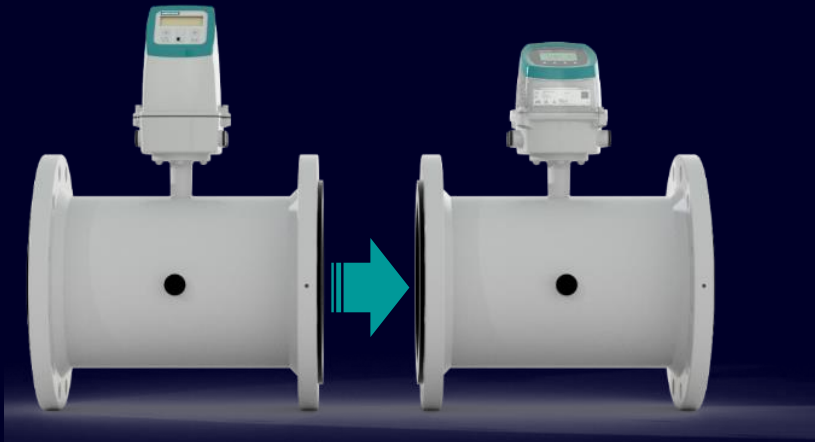
The following chart outlines the overall material composition of the calculated reference product. Product weight of 15.43 kg adds up with packaging weight of 3.03 kg to a total weight of 18.46 kg. Packaging consists of Box, Fixing material, Foil Film Wrap Bag Label, Paper.

Product Weight 15.43 kg



SITRANS FMT020

Product Design

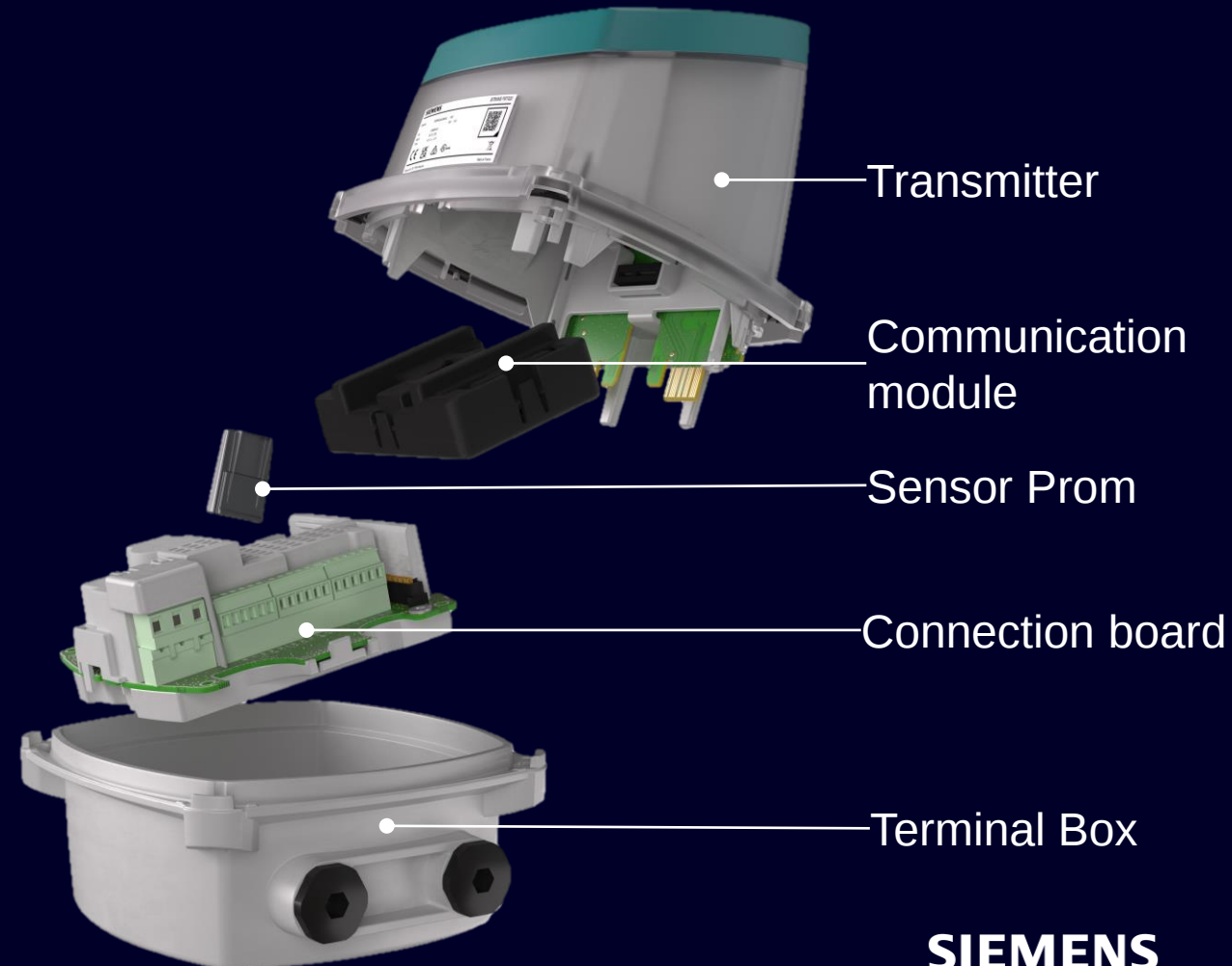


Identical to MAG5/6000:

- Pluggable communication modules
- SensorProm placed inside the terminal box

Differently from MAG5000/6000:

- Connection board with power supply unit (PSU)
- 0,2% accuracy are now on FMS500 and not on signalconverter



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SITRANS FMT020

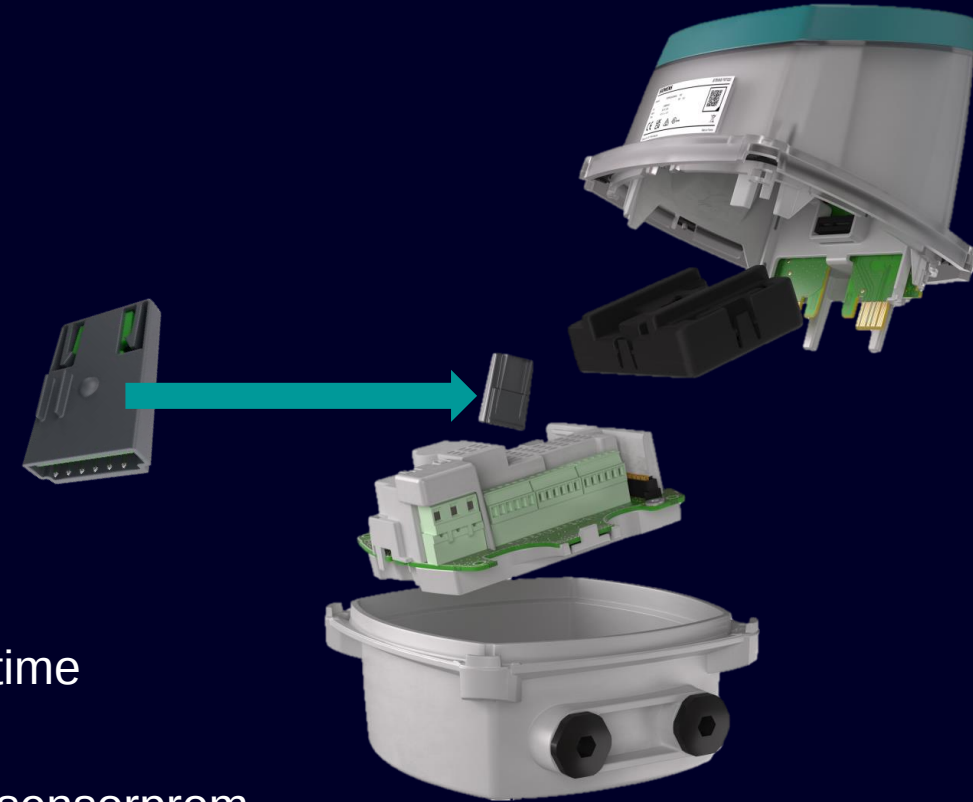
Technical Features – SensorPROM

MAG 5000/6000 SensorPROM



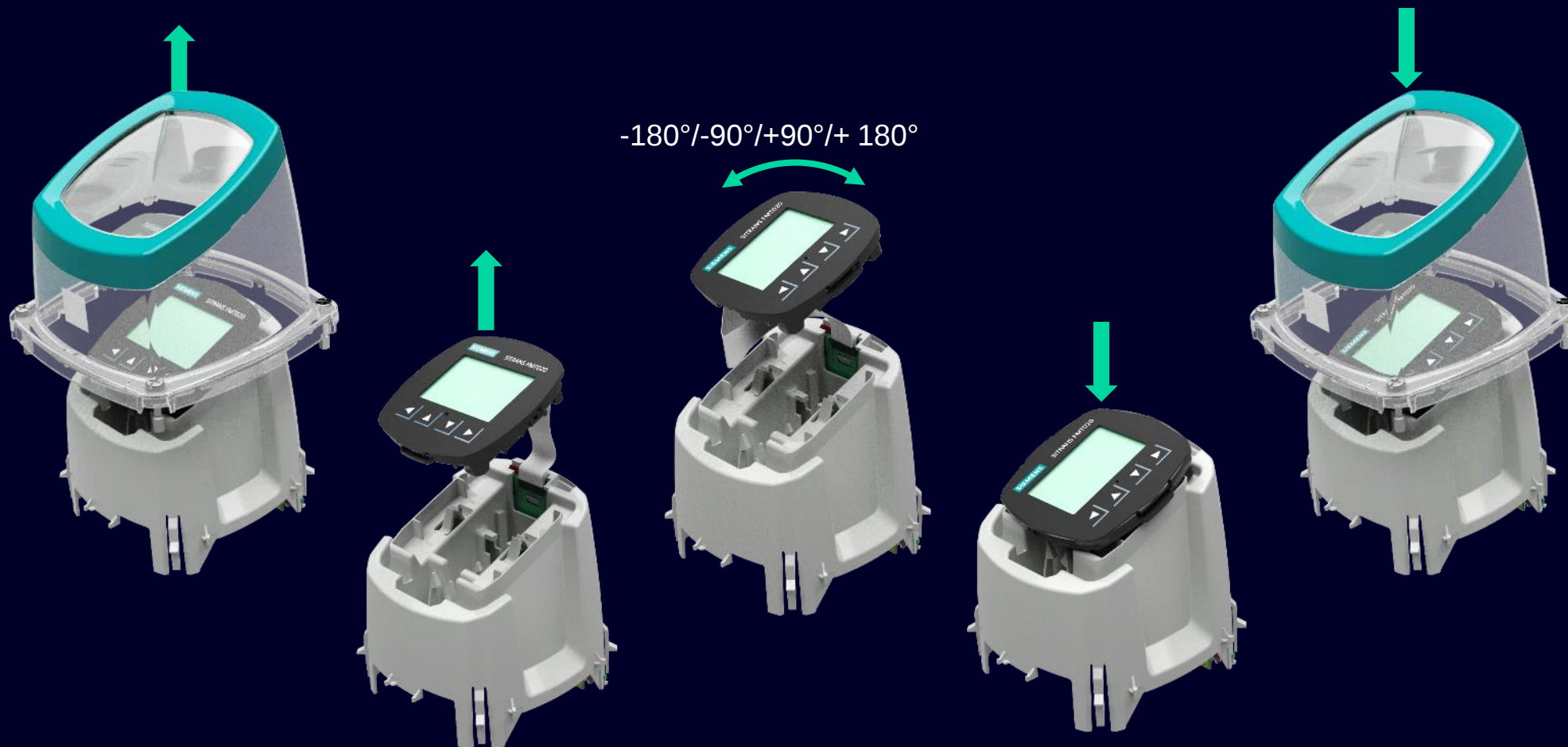
Automatic upload of:

- Sensor identity
- Calibration data
- Factory settings
- User-specific settings
- Fingerprint value for coil boost time measurement
- If needed easier to burn a new sensorprom



SITRANS FMT020

Technical Features – Display unit

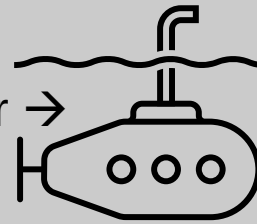


SITRANS FMT020 Design

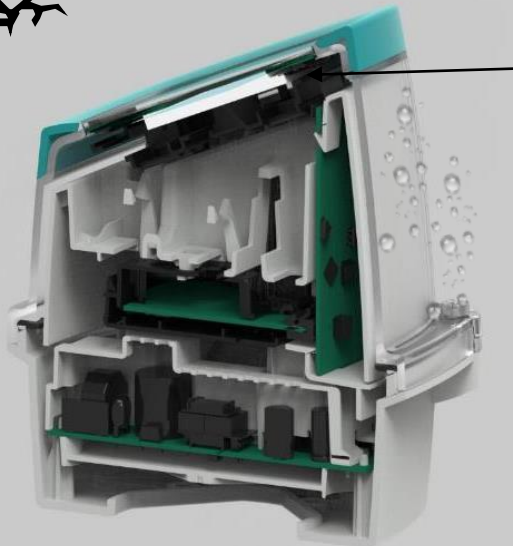
Technical Properties based on exhaustive testing



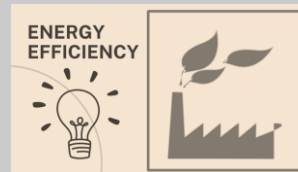
Protection class transmitter
IP66, 67 and 68



Impact-resistant plastic enclosure



Display inside the enclosure
→ Always protected

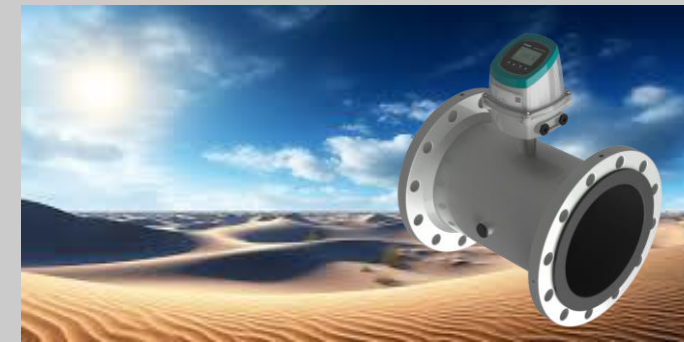


15% less power than
MAG5/6000

Protection class sensor
IP68 without potting → 2m, 10 days
IP68 with potting → 10m, continuously



Ambient temperature: -40...65°C



SITRANS FMT020

Technical Features – Micro-SD Memory Card

To access the Micro-SD card memory, the user will remove the top enclosure. The Micro-SD card holder is located on top of the main board and will be accessible through a slot on the main PCB cover.

SD-card will allow the user to log data, save settings, and update the firmware.



SITRANS FMT020

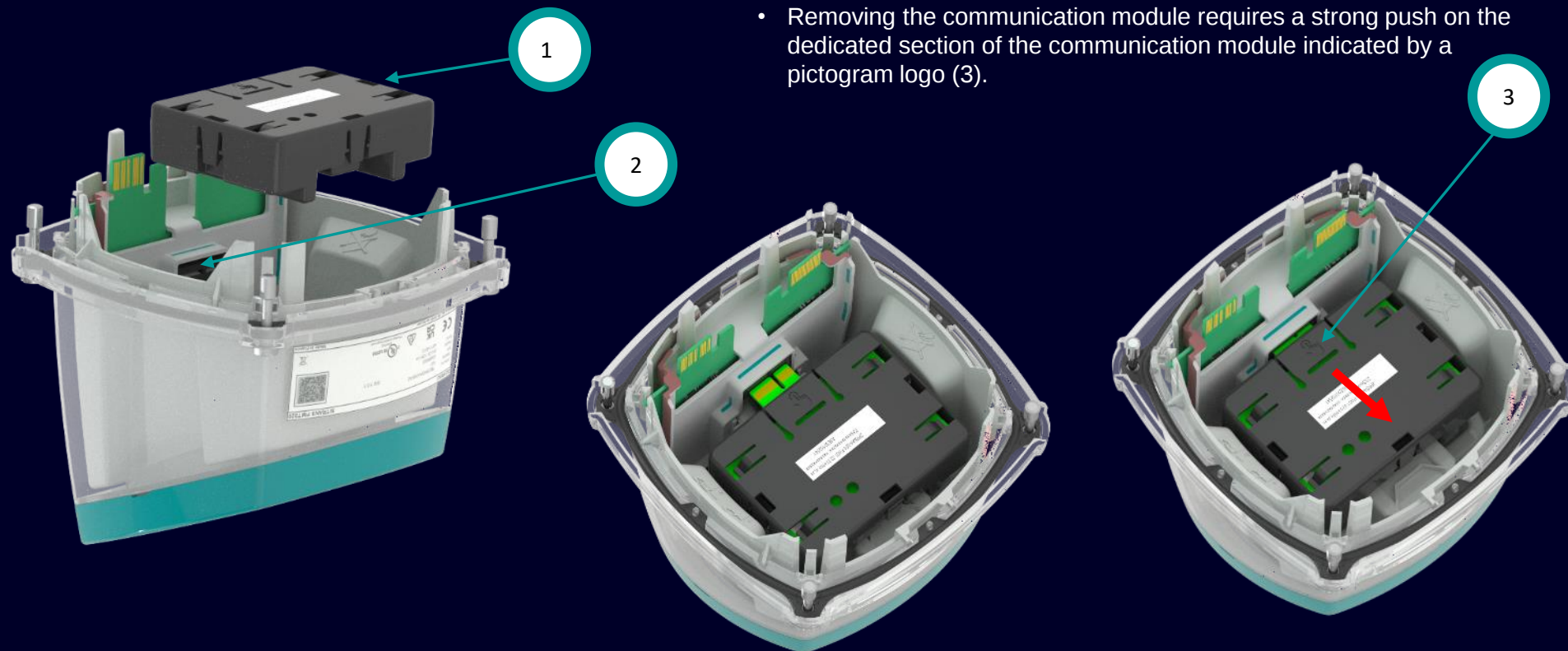
Technical Features – Bus Communication Add-on Module

HART
COMMUNICATION PROTOCOL

PROFI
NET

Modbus
RTU

EtherNet/IP



Digitalization Standardization

Overview of existing Libraries

Fields of Automation with SIMATIC

Factory Automation

TIA Portal & S7-1200/1500

Process Automation

PCS7 & S7-400/AS410

Library of Basic Controls (LBC)



LINK

General Functions (LGF)

LINK

Communication Library

LINK

Technological Libraries

LINK

Library for Basic Processes (LBP)



LINK

Advanced Process Library (APL)

Industry Library (IL)
Functional Add-On for the APL

SIEMENS

Webserver commissioning

≡ SIEMENS

English ▾

Expert

Log out



Tag:

Article number: 7ME6532-2YF02-1G...

Manufacturer: SIEMENS

Device status

Diagnostic log

2023-09-27 21:01	Electrical conductivity above warning limit	281
2023-09-27 21:01	Electrical conductivity above alarm limit	280
2023-09-27 21:01	Transmitter firmware incompatible	178
2023-09-27 21:01	Sensor firmware incompatible	173
2023-09-27 21:01	Transmitter firmware incompatible	172
2023-09-27 21:01	SensorFlash parameter backup disabled	152

☆ Favorites

🔍 Process values

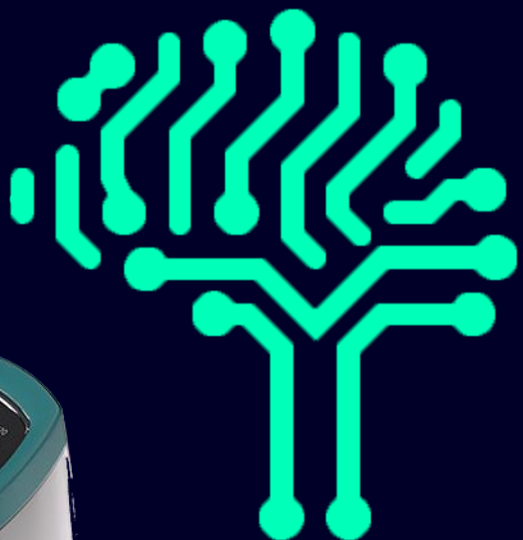
💡 Identification

⚙ Detailed setup

🔧 Maintenance and diagnostics

SITRANS FMT020 and Verificator

Three layers for peace of mind



External verification of the FMT020:

- On-demand confirmation of operational reliability
- External verification report confirming system's accuracy specification
- Traceability to International Standards via yearly calibration



Self-verification:

- Evidence of proper device operation
- Self-verification report available via Webserver and PDM and visible via HMI
- Enables condition-based maintenance

Self-diagnostics:

- Deviation against factory reference values (acc. NAMUR 107)
- Continuous testing during operation of 100+ alarms
- Quick, concise remedy steps in case of failures

Continuum of self-verification of the flowmeter

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FMT020 Product overview

First release



Process values	• Volume flow • Flow velocity • Electrical conductivity
Outputs	• Current output • Digital output • Relay output
Communication modules	• HART • Modbus RTU • Profinet • Ethernet IP
Ambient temperature	• -40 ... +65 ° C (-40 ... +149 ° F) (max. humidity 98% RH)
Enclosure IP rating	• IP66/67, NEMA6P
Display	• 14-digits • 4 capacitive touch keys
Power supply	• AC version 100 ... 240 V AC, 50/60 Hz, 25 VA • DC version 24 V DC ±20 %, 12 W
Approvals	• CE (LVD, EMC, RoHS), UKCA • UL, CSA certified per standard EN / IEC 61010-1 • EAC (Kazakhstan)

FM520 Product overview

First release

Nominal diameter	- Coned sensor (octagon liner): DN 15 ... 40 (1/2" ... 1 1/2") - Coned sensor: DN 50 ... 300 (2" ... 12") - Full bore sensor: DN 350 ... 1200 (14" ... 48")
Ambient temperature	- Sensor -20 ... +70 ° C (-40 ... +158 ° F) - Compact with transmitter -20 ... +65 ° C (-40 ... +149 ° F)
IP rating	- Standard IP66/67, NEMA 4X/6 - Optional IP68 and NEMA 6P (2m, 10 days) for sensor in remote design - IP68 and NEMA 6P (10m, continuously) for sensor in remote design
Accuracy	- Standard : 0,4% - Optional : 0,2%
Calibration - Standard - Optional	- Zero-point, 2 x 25 % and 2 x 90 % 5-point calibration: 20 %, 40 %, 60 %, 80 %, 100 % of factory Qmax 10-point calibration: ascending and descending at 20 %, 40 %, 60 %, 80 %, 100 % of factory Qmax - Matched pair calibration: default, 5-point or 10-point - ISO/IEC 17025 accredited, 5-point, matched-pair calibration
Approvals	- CE (LVD, EMC, RoHS), UKCA - Drinking water - EAC (Kazakhstan)

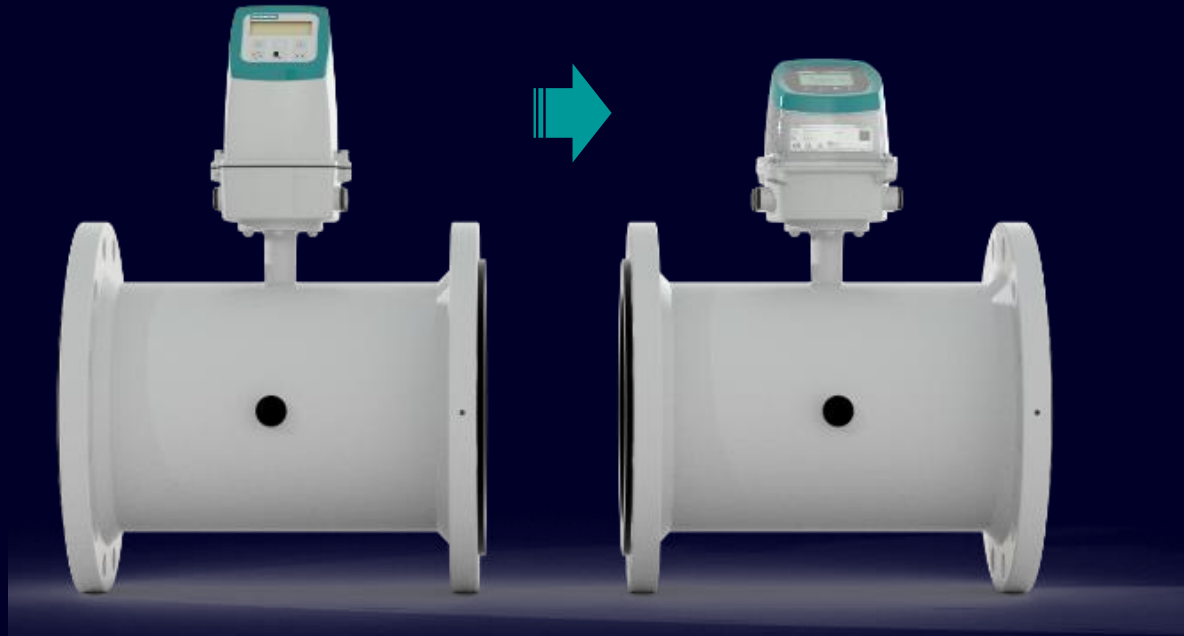
New MAG Product Names completes the SITRANS FLOW Platform

Naming terminology and MLFB roots



Conversion kit

From SITRANS MAG5/6000 to SITRANS FMT020
on existing SITRANS MAG5100W

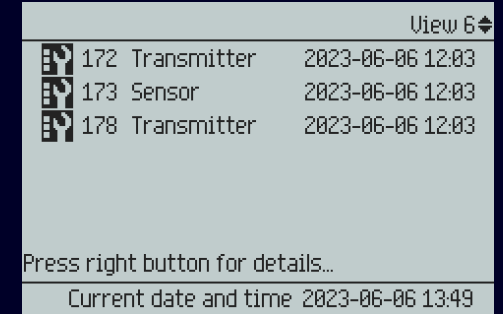
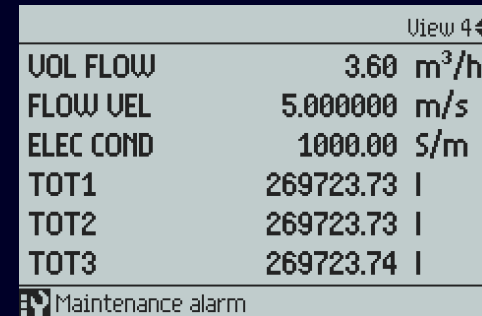
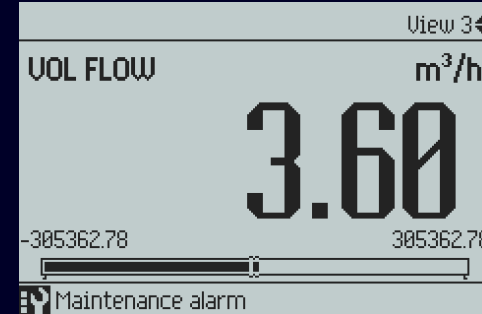
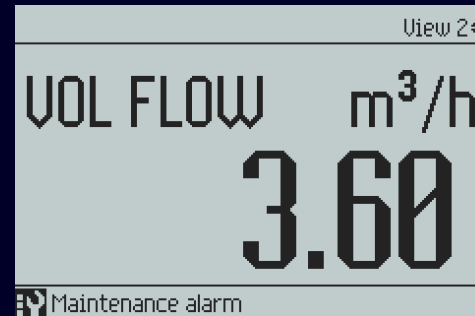
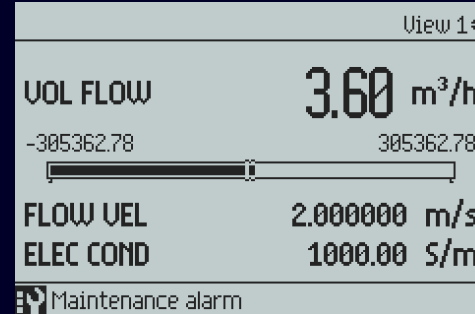


Conversion operation needs 2 orders:

- Transmitter SITRANS FMT020
- Conversion kit for compact product
in version M20 or NPT
serial number and MLFB from MAG must be provided
 - to deliver the converted and programmed SENSORPROM
 - to deliver the new product label (in Compact configuration)

Local User Interface

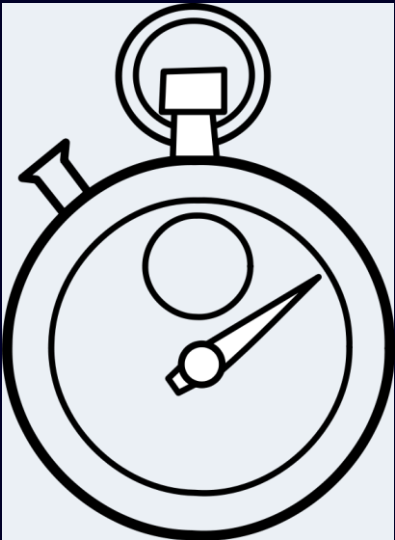
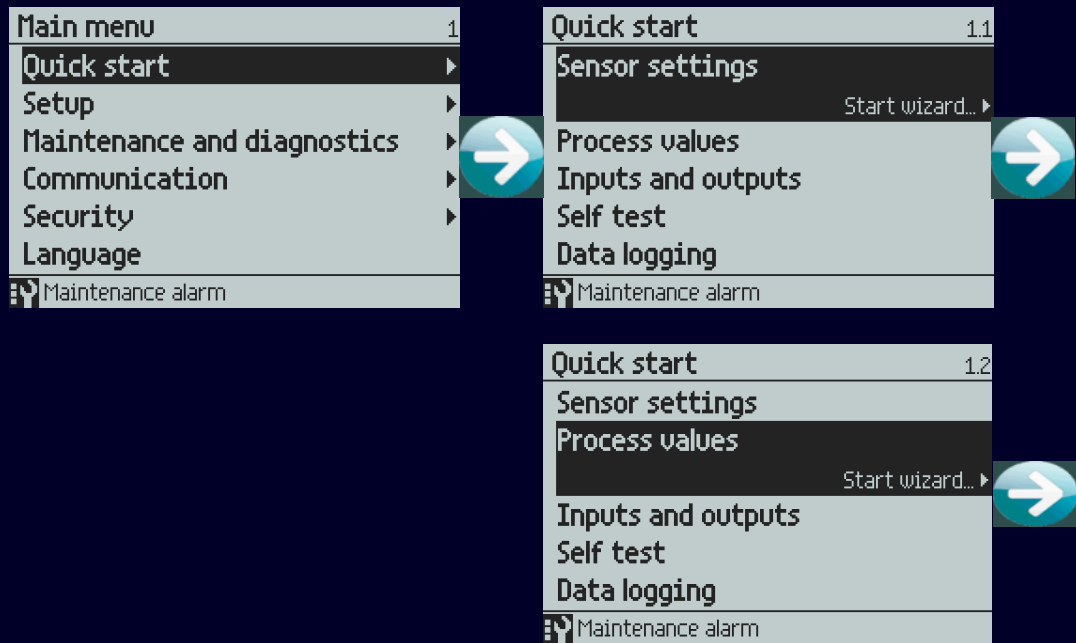
Multiple Languages for a friendly and easy commissioning



Samme menustruktur som på øvrige instrumenteringsprodukter:

- 4 trykknapper
- Clamp on
- Niveau controller, radar
- Positioner, Tryktransmitter
- ETC

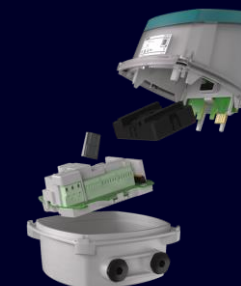
Quick Start Wizards



QR-kode som giver nem adgang til produktidentitet manual osv.

SITRANS FMT020

Next generation flow measurement transmitter



More robust

New compact and very robust design secures use under harsh conditions.
Recognized by Design award 2023.

More reliable

Both, internal and external verification available.
Highest standard on metrology.

Easier to commission

The SENSORPROM memory enables automatic use of sensor identity, calibration data, user specific data and more. Quick Start Wizards.

Easier to service

Comprehensive device check, self-diagnosis and onboard verification functions.



More versatile

Simultaneous measurement of volume flow, flow velocity and electrical conductivity.

More sustainable

15% lower power consumption in comparison with previous generation MAG5000/ 6000.
Large Spare Parts catalog for easy repairs.

Greater flexibility

Compact or remote installation with the same transmitter and sensor.
Large, rotatable, 14-digit graphic display.

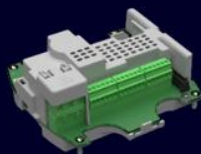
Better connectivity

Plug & play communication modules: HART, Profinet, Ethernet/IP, Modbus RTU and more to come. Integrated in TIA Portal and PCS7.

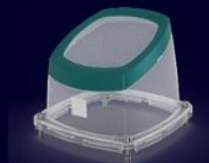
Spare Parts and Accessories



Connection board
(PSU subsets AC / DC)



Top Housing



Terminal Box



HMI unit



Sensorprom
1pcs Programmed or
10 pcs blank



Main PCB cover



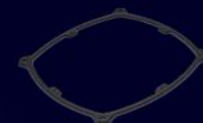
Display frame (Bumper)
Petrol green



Terminal box lid
Siemens color



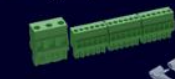
Gasket top housing



Sensor board
(connection plate)



Plug-in connector set
Screw terminal PSU+IO,
Earthing-clips



Transmitter & Sensor
Nameplate



Communication
add-on modules



Wall mounting unit
M20 or 1/2"NPT with adapter



Cable glands
4pcs



or
1/2"NPT with adapter
Not UL approved



Conversion kit
Compact or remote systems



See FMT020 catalog pages for ordering
Article No.

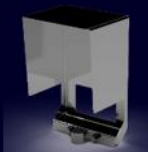
Industrial
MicroSD



Sun shield
for remote mount



Sun shield for
integral mount



Cables
Standard or special



Potting kit
For IP68 and NEMA 6P



SIEMENS



SITRANS FM

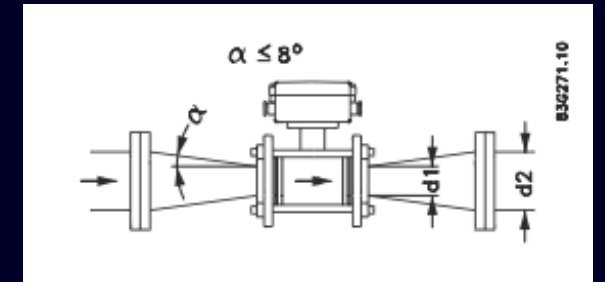
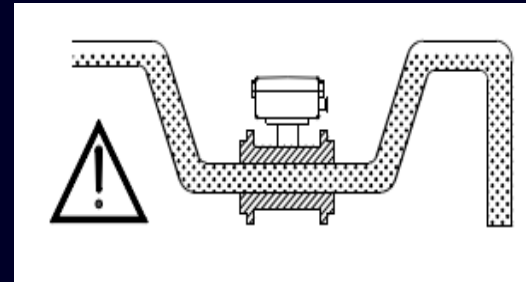
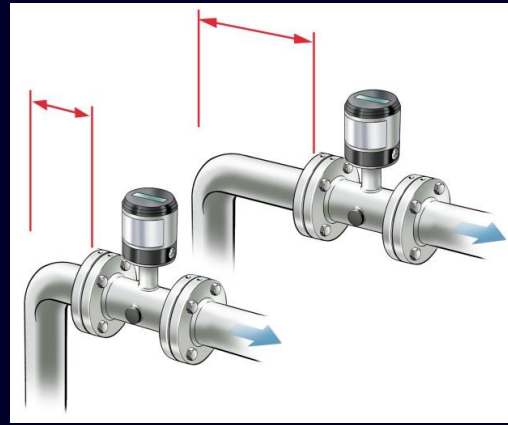
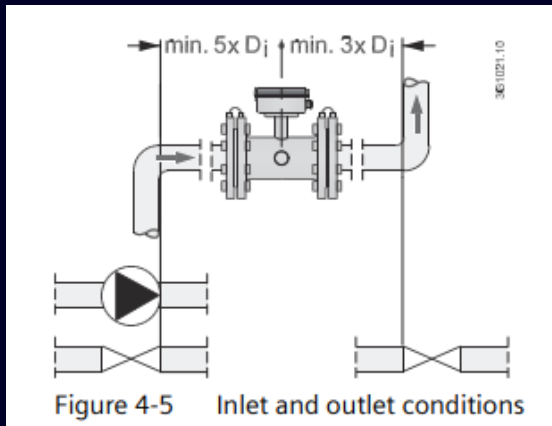
Zero Inlet and Outlet installation

Vi har i forvejen MI001 godkendelse med $0 \cdot D_i$ før og efter måler, nu er indbygningsforholdet testet yderligere

SITRANS FM

Standard Inlet / Outlet Conditions

- For the SITRANS FM flowmeters to provide accurate flow measurements allow 5xD at inlet and 3xD at outlet from the electrode.



Straight pipe conditions

Avoid the following:

- Inlet conditions which might cause flow disturbances – installing Elbows, Tee's & Reducers at inlet.
- Installation of partially open valves < 10xD at inlet.

U-tube installation

- For partially filled pipes.
- For pipes with downward flow.
- Free outlet flow.

With reducer installation

- Between two reducers (for example DIN 28545) at $\alpha \leq 8$ (pressure drop curves apply).

SITRANS FM

Flow installation in 0xD inlet and outlet conditions – non-optimal piping – Test conditions

Objective

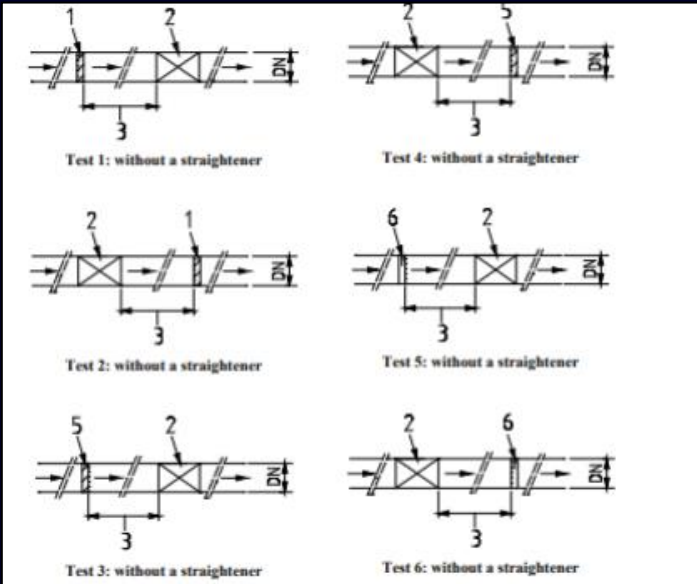
- To verify that SITRANS FM flowmeter complies with the requirements of OIML R 49-2:2013, 7.10 (Flow disturbance tests) for forward flow with the following number of straight pipe lengths →
 - Upstream: 0D
 - Downstream: 0D

Test description and sequence

- Using the flow disturbers of types 1, 2, and 3, determine the error of indication of the meter for each of the installation below →

Test 0: Initial calibration – No flow Disturber	
Test 1: Type 1 – Upstream	Test 4: Type 2 – Downstream
Test 2: Type 1 – Downstream	Test 5: Type 3 – Upstream
Test 3: Type 2 – Upstream	Test 6: Type 3 – Downstream

Flow disturbance scheme	
1 type 1 disturber — swirl generator sinistrorsal	4 straightener
2 Meter	5 type 2 disturber — swirl generator dextrorsal
3 straight length = 0 mm	6 type 3 disturber — velocity profile flow disturber



Results and Conclusion

Results

- The test reports show that even if the flow meter is not installed as recommended by Siemens, we can still expect to have an relative good accuracy of the measurement (*)
- With Zero Inlet and Zero Outlet straight runs, we can offer accuracy between ± 0.2 to $0.6\% \pm 2$ mm/s (max.)
- The liquid has to be conductive and homogeneous

Conclusion

- The flowmeter must be installed following the installation guidelines for ideal performance.
- We offer performance of between ± 0.2 to $0.6\% \pm 2$ mm/s (max.) of rate when...
 - The optimal mechanical piping conditions don't exist
 - The modification of the process piping is impossible and expensive

(*) Please note that the results reflect the flow meter performance under controlled installations and can only be used as guidance or indication of accuracy under OxD installation conditions

Kontakt

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