



Fig. 3/23 SITRANS F M transmitter InterMag 2

Application

The InterMag 2 is a microprocessor-based transmitter with a built-in alphanumeric display in several languages. The transmitter evaluates the signals from the electromagnetic sensors of the SITRANS F M 711/A, 711/E, 711/S and 711/F5 series and the insertion sensors S1 and S2. SITRANS F M InterMag 2 is available as compact and remote versions. SITRANS F M F5, F M 711/S and the insertion sensors S1 and S2 are only available as the remote version.

The magnetic constant field means that the InterMag 2 can be used for medium flow velocities up to 12 m/s (39.4 ft) and for a minimum conductivity of 3 $\mu\text{S/cm}$.

The main applications of the SITRANS F M InterMag 2 transmitter can be found in the following fields:

- Water, waste water
- Power generation and distribution
- Chemical and pharmaceutical industries
- Food industry

Special features of the transmitter:

- Fast signal processing with 16-bit microcontroller
- Automatic recognition of sensor type and calibration data as result of SmartPlug
- PROFIBUS-PA (Profile 3.0) or HART communication
- Simple menu operation with two-row display (option)
- Self-monitoring function
- Internal simulation for all output functions
- Monitoring of sensor using magnetizing current and wet electrode function
- Analog output and digital outputs for pulses, device status, limits, flow direction, frequency output
- Optional switch input for resetting counter values or for switching off the measuring equipment (PZR)

Connection and mode of operation

Information on connection, mode of operation and installation can be found in the data sheets for the sensors.

Displays and controls

Operation of the InterMag 2 transmitter can be carried out using:

- Control and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software with HART communication
- PC/laptop and SIMATIC PDM software with PROFIBUS-PA communication

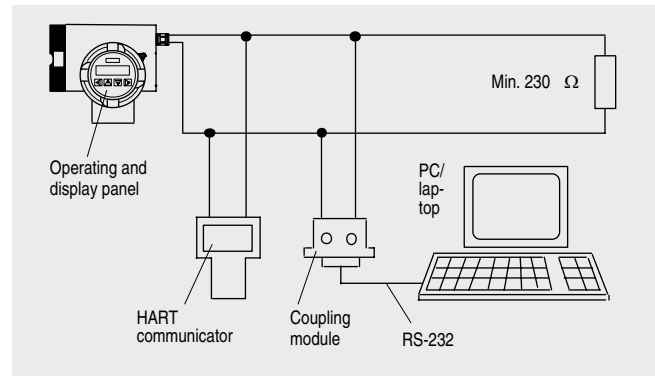


Fig. 3/24 HART communication

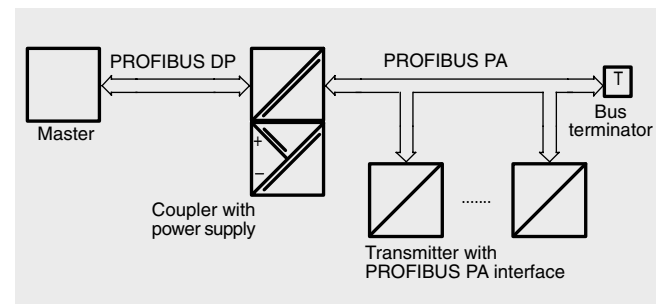


Fig. 3/25 PROFIBUS-PA communication

Technical data

Application	See left
Mode of operation and design	See SITRANS F M sensor
Measuring principle	Electromagnetic with pulsed constant field (PDC)
Magnetic field excitation	Automatic mains synchronization
• 50 Hz AC power supply	3.125/6.25/12.5 Hz
• 60 Hz AC power supply	3.750/7.5/15.0 Hz
• DC power supply	3/6/12 Hz
Outputs	
Electrical isolation	Outputs electrically isolated from one another and from the power supply
<i>For 20 mA / HART devices</i>	
Analog output	
• Signal range	4 to 20 mA
• Upper limit	20 to 22.5 mA
• Failure signal	3.6 mA, 22 mA or 24 mA
• Load	Max. 600 Ω for HART communication, max. load voltage 15 V, for HART communication: $\geq 230 \Omega$

Flowmeters

SITRANS F M

Transmitter InterMag 2

Technical data (continued)

Communication	Via analog output with PC coupling module or HART communicator HART, version 5.1 230 to 500 Ω with coupling module, 230 to 600 Ω with HART communicator
<ul style="list-style-type: none"> • Protocol • Load 	
Digital output 1	<i>Active:</i> DC 24 V, ≤ 24 mA $R_i = 170 \Omega$ <i>Passive:</i> open collector, max. DC 30 V, 200 mA Pulses: Significance ≤ 5000 pulses/s Pulse width ≥ 0.1 ms Frequency: Limit frequency ≤ 10,000 Hz Limits for flow and quantity, flow direction, alarm
<ul style="list-style-type: none"> • Can be configured for active or passive signal, positive or negative logic • Output configuration 	
Digital output 2	Switching power max. 5 W, max. 50 V, max. DC 200 mA self-resetting fuse $R_i = \leq 9 \Omega$ Limits for flow and quantity, flow direction, alarm
<ul style="list-style-type: none"> • Relay, NC or NO function • Output configuration 	
Input (only as alternative to digital output 2)	Set measured value or counter to zero Max. 30 V, $R_i = 3 \text{ k}\Omega$ High level +11 to 30 V Low level -30 to +5 V
<ul style="list-style-type: none"> • Input function can be configured as high-active or low-active • Signal voltage 	

For PROFIBUS devices

PROFIBUS-PA	
<ul style="list-style-type: none"> • Communication 	Layers 1 and 2 to PROFIBUS-PA Transmission system to IEC 1158-2 Layer 7 (protocol layer) to PROFIBUS-PA and DP V1 (EN 50 170) Device class B, device profile 3.0 Max. 4 simultaneous C2 connections
<ul style="list-style-type: none"> • Bus voltage 	9 to 32 V permissible (separate device supply via additional power supply connection; four-wire device)
<ul style="list-style-type: none"> • Current consumption from bus 	10 mA; ≤ 15 mA in event of fault as result of electr. current limiting
Digital output 1	Open collector, max. DC 30 V, 200 mA Pulses: Significance ≤ 5000 pulses/s Pulse width ≥ 0.1 ms Frequency: Limit frequency ≤ 10,000 Hz Limits for flow and quantity, flow direction, alarm
<ul style="list-style-type: none"> • Passive signal, can be configured for positive or negative logic • Output configuration 	

Displays and controls

General display	LCD with two rows with 16 characters each, backlighting
Multi-display	For flow, quantity, flow velocity
Controls	4 optical elements, hierarchical menu control with alphanumeric text and code numbers

Accuracy

under reference conditions	
Pulse output	<ul style="list-style-type: none"> • With $v > 0.25 \text{ m/s}$ (0.82 ft/s) ≤ ± 0.5% of measured value ± 0.0012 m/s (0.004 ft/s) • With $v < 0.25 \text{ m/s} \pm 0.0025 \text{ m/s}$ (0.82 ft/s ± 0.008 ft/s)
Analog output	As pulse output plus ± 0.1% of measured value ± 20 μA 0.2% of measured value
Repeatability	
<u>Reference conditions</u>	
<ul style="list-style-type: none"> • Temperature of medium • Ambient temperature • Warm-up time • Installation conditions 	25 °C ± 5 °C / 77 °F ± 41 °F 25 °C ± 5 °C / 77 °F ± 41 °F Min. 30 min Inlet pipe section ≥ 10 x DN Outlet pipe section ≥ 5 x DN fitted centrally on pipeline Water without gases or solids, > 200 μS/cm
<ul style="list-style-type: none"> • Medium 	

Installation conditions

Ambient conditions and temperatures	See also sensors
<ul style="list-style-type: none"> • InterMag 2 transmitter <ul style="list-style-type: none"> - Remote design - Compact design 	-20 °C to +65 °C / -4 to +149 °F -20 to +65 °C / -4 to +149 °F, at temp. of medium <60 °C/140 °F Depending on sensor at temperature of medium 60 to 130 °C/ 140 to 266 °C 0 to +50 °C / 32 to -122 °F -25 to +80 °C / -13 to 176 °F IP 67 / NEMA 4X
<ul style="list-style-type: none"> • Control and display unit • Storage • Degree of protection 	To EN 50 081 To EN 50 082 / NAMUR
Electromagnetic compatibility (EMC) for use in living accommodation and industrial environments	
<ul style="list-style-type: none"> • Emitted interference • Noise immunity 	
Medium conditions	
<ul style="list-style-type: none"> • Temperature of medium for compact devices 	-20 °C to +130 °C/-4 to 266 °F depending on sensor
Minimum conductivity of medium	≥ 3 μS/cm
<ul style="list-style-type: none"> • For SITRANS F M 711/A, 711/E, 711/S sensors and insertion sensors • For SITRANS F M 711/F5 sensors 	≥ 10 μS/cm

Design

Transmitter weight	4.4 kg
Compact versions	Transmitter fitted on metering tube
Remote version	Transmitter must be connected to sensor using a screened cable
Housing	Die-cast aluminium
Electrical connection	Compact version: 2 x M20 or 1/2"-NPT Remote version: like compact version plus 2 x M16 or 1/2"-NPT
Mounting of compact version	Transmitter already fitted on metering tube
Mounting of remote version	Stainless steel mounting plate for wall mounting, optionally for wall and pipeline mounting

Power supply acc. to rating plate

AC voltage	AC 100 to 230 V ± 15% (85 V to 265 V) 47 to 63 Hz or AC 20.4 to 26.4 V 47 to 63 Hz
DC voltage	DC 19.2 to 30 V
Power consumption	Approx. 10 W
Power failure	Stored energy time at least 1 mains cycle (> 20 ms)

Approvals

<ul style="list-style-type: none"> • Explosion protection 	Available soon
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Control and display unit for SITRANS F M InterMag 2

The control and display unit permits simple operation without accessories. It is not necessary to open the housing. The high degree of protection (IP 67 / NEMA 4X) is therefore guaranteed at all times.

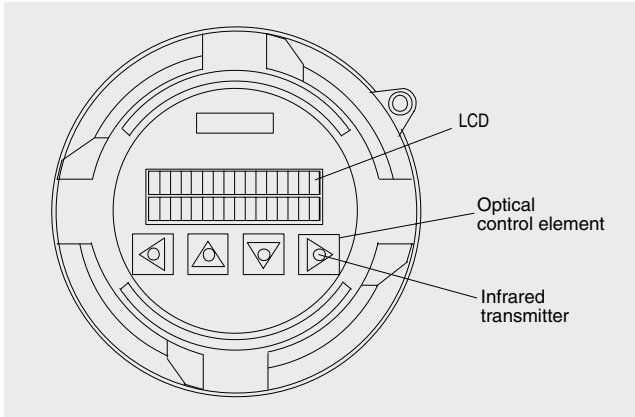


Fig. 3/26 Control and display unit

The individual functions and parameters are selected using a hierarchically structured, multi-language input menu with four optical input elements. The parameters can be specifically selected and modified using alphanumeric text and code numbers, e.g.:

- Operating parameters such as measuring range, physical dimensions or device information
- Limits for flow, counter configurations
- Noise suppression using separate interference blanking and damping as well as hysteresis functions
- Automatic mains synchronization
- Display parameters (freely-configurable text display)
- Display in volume or mass units
- Density as constant input value for conversion of volume into mass
- Zero flow cut-off
- Forward and reverse flow measurements
- Flow direction display and evaluation
- Diagnostics functions and control values
- PROFIBUS address
- Functions of analog output: proportional flow, failure signal
- Functions of digital output 1 (transistor): frequency output proportional to flow, alarm, forward or reverse flow signal, min. or max. limit for flow and counter
- Functions of digital output 2 (relay): alarm, forward or reverse flow signal, min. or max. limit for flow and counter
- Simulation of output signal via analog output, digital output 1 and digital output 2
- Option: digital output 2 as digital input for resetting counter values or for interruption in measurement (PZR)

The HART protocol is implemented via the analog output (current output). This communication capability permits parameterization of the device using the HART communicator or a PC/laptop and SIMATIC PDM software in addition to local operation.

In the SITRANS F M InterMag 2 version with PROFIBUS-PA, the analog output and the digital output 2 are replaced by the digital PROFIBUS-PA output. Parameterization of the device is then possible using PROFIBUS communication and SIMATIC PDM in addition to local operation.

Ordering data

SITRANS F M
Electromagnetic InterMag 2 transmitter
for constant field

Output/communication
4 to 20 mA with HART protocol
PROFIBUS-PA
4 to 20 mA with HART protocol, digital input

Power supply
AC 100 to 230 V
AC/DC 24 V

Control and display unit
Without
With

Design
Remote design
Compact design

Cable glands
M20/M16 x 1.5
½"-14 NPT

Further designs

Please add "Z" to Order No. and specify Order code(s).

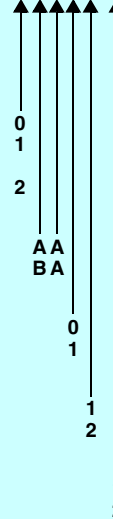
Rating plate inscription English	B11
Measuring range, specify in plain text: Y01: 0 to m³/h	Y01
Pulse significance, specify in plain text: Y02: 0 to Imp./l	Y02
Setting of digital outputs, specify in plain text: Y03: Setting of digital outputs:	Y03
Measuring-point number (max. 8 characters), specify in plain text: Y15:	Y15
Measuring-point description (max. 16 characters), specify in plain text: Y16:	Y16
Stainless steel tag plate	Y17

Accessories

Strengthened mounting bracket for wall and pipeline installation
A02

Order No.

7ME5033 - AA0



Flowmeters SITRANS F M

Transmitter Intermag 2

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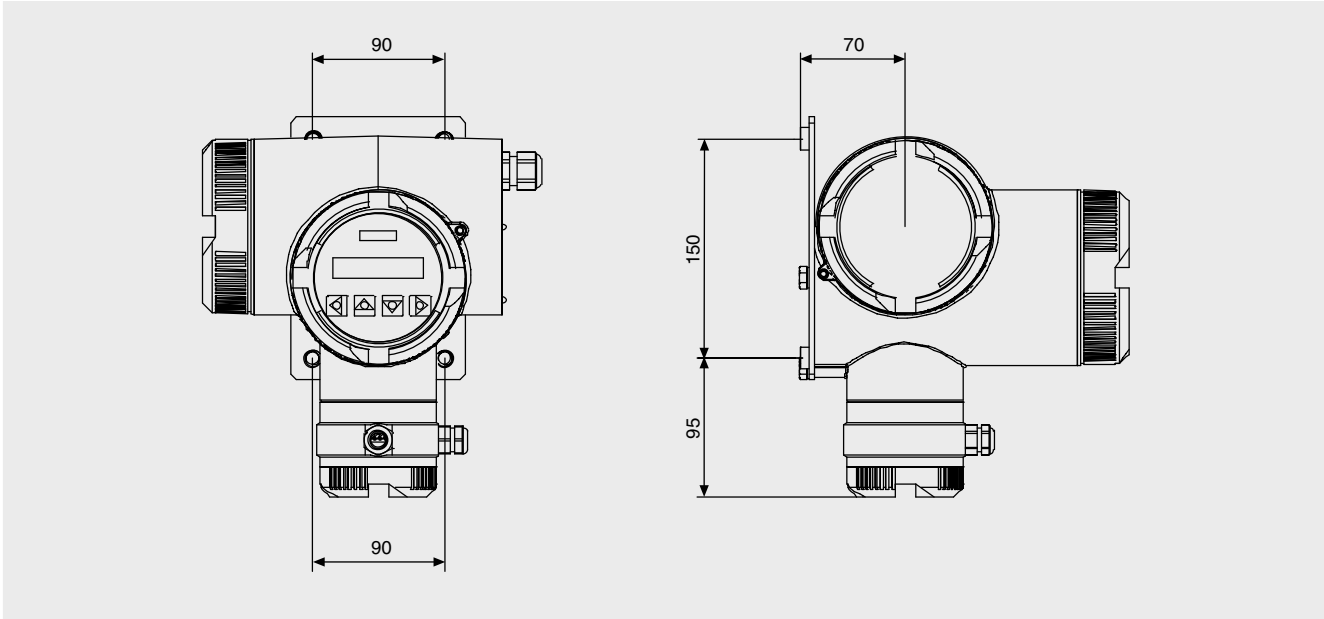


Fig. 3/27 SITRANS F M transmitter Intermag 2 with standard mounting plate, dimensions in mm

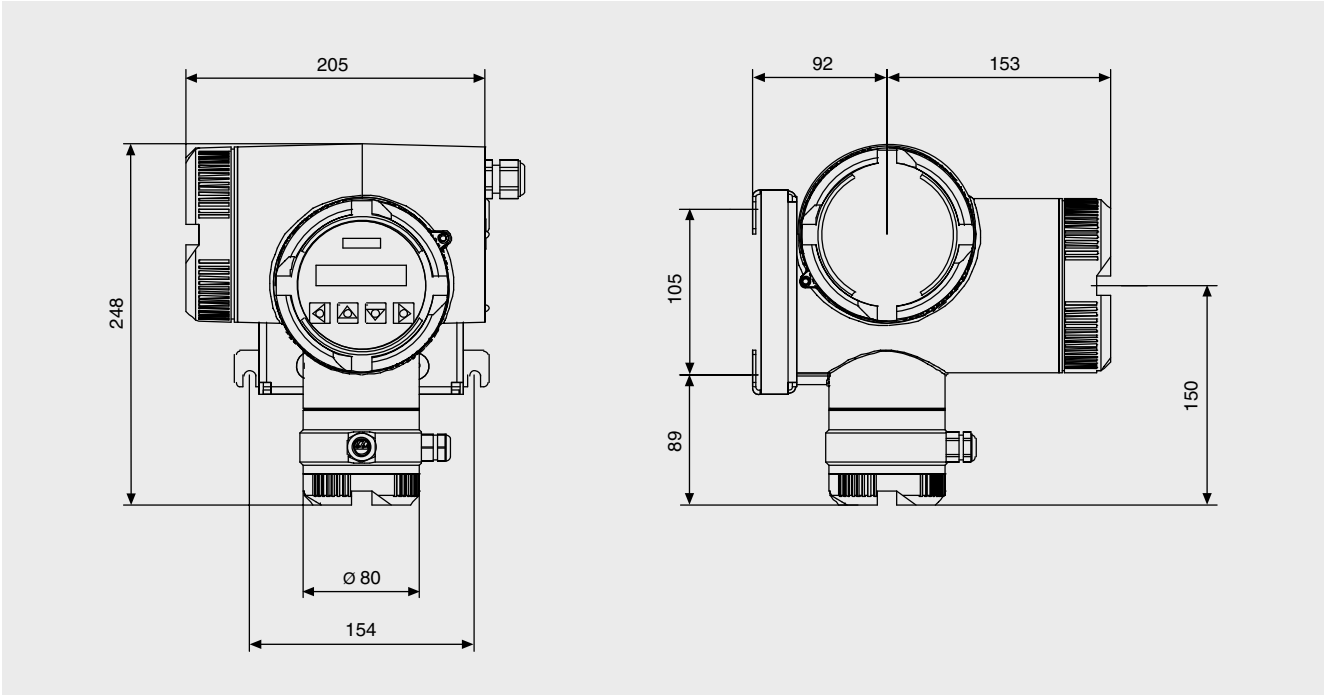


Fig. 3/28 SITRANS F M transmitter Intermag 2 with optional mounting plate also for pipeline mounting, dimensions in mm