Water for life

Siemens Process Instrumentation and Analytics –
Value solutions for ressource No. 1

water

Product Information • 2006

SIEMENS

	POINTEK ULS 200	POINTEK CLS 100	POINTEK CLS 200
Applications and brief description	Contactless ultrasonic switch with two switch points for measuring the level of bulk materials, liquids and slurries; ideal for sticky media.	Point level capacitance switch based on inverse frequency shift principle for detecting level of liquids, slurries, foams, powders, and interfaces.	Point level capacitance switch based on inverse frequency shift principle for detecting level of liquids, slurries, foams, solids, powders, and interfaces. Available in both analogue and digital versions.
Span/Range	0.25 – 5 m (liquids) 0.25 – 3 m (solids)	Maximum insertion length 120 mm	Cable probe length and switching point: 3000 to 35000 mm Rod probe length and switching point: 120 to 5500 mm
Measurement Points all Channel(s)	1	1	1
Wetted parts material **Materials wetted by medium**	PVDF	PPS, stainless steel	PPS, stainless steel
Housing materials	Polycarbonate or aluminium (epoxy-coated)	PPS, stainless steel	Aluminium (epoxy-coated)
I: inputs **O: outputs** **C: communication**	2 SPDT changeover contacts	O: 1 changeover contact (SPDT) 1 transistor output 2-wire loop current output 4/20 mA or 20/4 mA	O: 1 changeover contact (SPDT) 1 transistor output C: PROFIBUS PA
Process pressure, absolute	1.5 bar	0 to 10 bar	0 to 10 bar
Temperature of medium/process	-40 to +60 °C	-40 to +100 °C	-40 to +125 °C
Ambient temperature	-40 to +60 °C	-40 to +85 °C	-40 to +85 °C
A: accuracy **L: long-term stability**	A: 0.25 %	A: ±2 mm	A: ±2 mm
Process connections (relevant for water and waste water)	2" NPT, 2" BSP, flange adapter	1" BSPT 3/4" NPT	3/4" BSPT 1" BSPT 1 1/2" BSPT Flanges ANSI and DIN
Certificates/approvals (selection)	ATEX, FM, CSA	ATEX, FM, CSA, WHG	ATEX, FM, CSA, WHG
Power supply	18 – 30 V DC 100 to 230 V AC, 50/60 Hz	10 – 30 V DC	12 – 250 V AC/DC
Degree of protection	IP67	IP65 or IP68	IP65 or IP68
Important features	Acoustic cone: 10 ° Display 3 digits Programming using 2-push buttons	Tip sensitive switch, and unaffected by conductive or non-conductive build-up	■ Potted construction ■ High chemical resistance ■ Level detection independent of tank wall/pipe ■ High/low gain switch ■ Analog version: 3 LED indicators for adjustment control, output status and power ■ Digital version: integral LCD display and opt. PROFIBUS PA communication ■ Easy installation and maintenance ■ High frequency oscillation (5.5 MHz)

MultiRanger 100

Ultrasonic controller for contactless level measurement. Alarm function and simple control of wastewater pumps.

0.3 – 15 m
1
–
Polycarbonate
I: 2 digital inputs 10-50 VDC O: analog 0/4 – 20 mA, 3 relays, alarm C: RS 232 interface RS 485 interface PROFIBUS DP MODBUS RTU
–
–
-20 to +50 °C
A: 0.25 %
–
FM, CSA
12 – 30 V DC 100 to 230 V AC, 50/60 Hz
IP65 (for wall mount) IP54 (for panel mount)

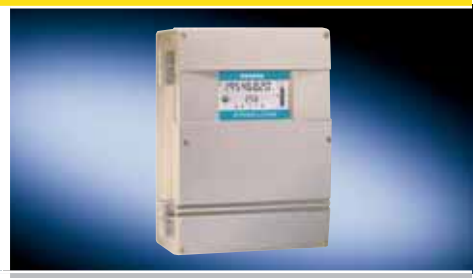
- Digital input for back-up level override from point level device
- Single or dual point level monitoring
- Auto False-Echo Suppression for fixed obstruction avoidance
- Differential amplifier transceiver for common mode noise reduction and improved signal-to-noise ratio
- Level measurements, simple pump control and level alarm functions
- Wall and panel mounting options
- For ultrasonic sensors with 44 kHz

HydroRanger 200

Universal ultrasonic controller for measurement of level, distance, flow, volume, difference, trend or quantity in open channels or weirs. With linearization function, determination of volume, and measurement of differences on screens.

0.3 – 15 m
1 or 2
–
Polycarbonate
I: analog 0/4 – 20 mA 2 digital inputs 10 – 50 V DC O: 2x analog 0/4 – 20 mA, 6 relays, alarm C: RS 232 interface RS 485 interface PROFIBUS DP MODBUS RTU
–
–
-20 to +50 °C
A: 0.25 %
–
FM, CSA, MCERT
12 – 30 V DC 100 to 230 V AC, 50/60 Hz
IP65 (for wall mount) IP54 (for panel mount)

- Monitors wet wells, weirs and flumes
- Single or dual point level monitoring
- 6 relays standard
- Auto False-Echo Suppression for fixed obstruction avoidance
- Anti-grease ring / tide mark buildup
- Differential amplifier transceiver for common mode noise rejection and improved signal-to-noise ratio
- Wall and panel or rack mounting options
- Connection for one or two sensors, 44 kHz Connection for one or two sensors, 44 kHz



SITRANS LUC 500

Ultrasonic controller for monitoring and control of water supply plants, rain storage reservoirs, flow measurements in weirs and open channels. Five relays for alarm functions, control of pumps and gate valves. Data memories, various I/O cards and communications functions available as options.

0.3 – 15 m
1 or 2
–
Polycarbonate
I: 1 analog 0/4 – 20 mA (up to 5) 8 digital 10 – 50 V DC (up to 16) O: 4x analog 0/4 – 20 mA, 6 relays, alarm C: RS 232 interface RS 485 interface PROFIBUS DP MODBUS RTU
–
–
-20 to +50 °C
A: 0.25 %
–
FM, CSA
12 – 30 V DC 100 to 230 V AC, 50/60 Hz
IP65

- Stand alone pump controller with built-in RTU for single and duplex pumping or booster stations
- Can accept flow velocity input for area times velocity based flow calculations
- Can log up to 10 events with extra memory card
- Can generate report by exceptions for 32 events as standard
- Features can be expanded as needed in the field. True “pay as you go” instrument.

SITRANS L level instruments

	OCM III	ECHOMAX XRS-5	ECHOMAX XPS
Applications and brief description	Highly accurate ultrasonic monitor for flow measurements in open channels and weirs. An input is available for connection of a flow velocity sensor.	Ultrasonic transducer provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/ wet wells, flumes, weirs and filter beds also in hazardous areas (zone 1).	Ultrasonic transducer provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/ wet wells, flumes, weirs and filter beds also in hazardous areas (zone 1).
Span/Range	0.3 – 3 m	0.3 – 8 m	0.3 – 15 m (*)
Measurement Points all Channel(s)	1	1	1
Wetted parts material **Materials wetted by medium**	–	–	–
Housing materials	Polycarbonate	PVDF and CSM	PVDF
I: inputs **O: outputs** **C: communication**	O: analog 0/4 – 20 mA, 3 alarm/contact relays, C: RS 232 interface	–	–
Process pressure, absolute	–	1.5 bar	1.5 bar (some Sensors up to 8 bar)
Temperature of medium/process	–	-20 to +65 °C	-40 to +95 °C
Ambient temperature	-20 to +50 °C	-20 to +65 °C	-40 to +95 °C
A: accuracy **L: long-term stability**	A: ±1 mm/m	Please refer the ultrasonic transmitter unit	Please refer the ultrasonic transmitter unit
Process connections (relevant for water and waste water)	–	1" BSP/NPT	1" BSP/NPT
Certificates/approvals (selection)	FM, CSA, MCERT	ATEX, FM, CSA	ATEX, FM, CSA
Power supply	9 – 30 V DC 100 to 230 V AC, 50/60 Hz	Powered from controller	Powered from controller
Degree of protection	IP65	IP68	IP68
Important features	■ Influent and effluent monitor ■ BS 3680 calculations provide exceptional accuracy in measuring flow ■ Up to 24 months data log, subject to logging rate ■ High accuracy on unique or non-standard weirs and flumes ■ AC and DC operation. Automatically switches to battery operation ■ Dual power input ■ Low power remote monitoring ■ Flow Reporter software available for remote monitoring, configuration and data retrieval ■ Connection for one ultrasonic sensor (XRS-5), 44 kHz ■ A velocity sensor (VS 100) can be connected	■ Narrow beam angle of only 10 ° ■ Chemically resistant PVDF copolymer enclosure and CSM rubber face ■ Measuring range: 8 m (26 ft) for measurement of liquids and slurries. ■ Fully submersible: IP68 degree of protection ■ Easy installation with 1" NPT or 1" BSP connection ■ Integral temperature compensation ■ Max. cable length 365 m ■ Can be connected to all existing Siemens Milltronics transmitters	■ Frequency of operation 44 kHz ■ Acoustic cone: angle of 6 ° ■ Integral temperature compensation ■ Cable length max. 365 m. (*) In combination with SITRANS LU transmitter up to 40 m.

SITRANS Probe LU

Compact ultrasonic 2-wire device for level measurement of liquids and sticky media in open and closed vessels.

0.25 – 6 or 12 m
1
PVDF, PTFE
PBT
O: 4 – 20 mA C: HART PROFIBUS PA
1.5 bar
-40 to +85 °C
-40 to +80 °C
A: 0.15 %
2" NPT, 2" BSP, flange adapter
ATEX, FM, CSA
12 – 36 V DC, 2-wire system
IP67 or IP68

- Continuous level measurement up to 12 m (40 ft) range
- Integrated temperature compensation
- Easy installation and simple startup
- PTFE or PVDF transducers for high chemical resistance
- Patented Sonic Intelligence signal processing
- Extremely high signal-to-noise ratio
- Auto False-Echo Suppression for fixed obstruction avoidance

SITRANS Probe LR

Compact 2-wire pulse radar with PP rod antenna for level measurement of liquids and slurries in storage and process tanks.

0.3 – 20 m
1
PP rod antenna
PBT
O: 4 – 20 mA C: HART
3 bar
-40 to +80 °C
-40 to +80 °C
A: 0.1 %
1 1/2" NPT, 1 1/2" BSP
ATEX, FM, CSA
24 V DC, 2-wire system
IP67 or IP68

- Uni-Construction polypropylene rod antenna
- Easy installation and simple startup
- Patented Sonic Intelligence® signal processing
- Extremely high signal-to-noise ratio
- Auto False-Echo Suppression of false echoes
- Measuring frequency: 5.8 GHz (6.3 GHz for North America)

SITRANS LR 200

Compact 2-wire pulse radar for level measurements of liquids and slurries in reservoirs and digested sludge tanks.

0.3 – 20 m
1
PTFE, PP as rod Stainless Steel 316 as horn or (sliding) wave guide antennas
Aluminium (polyester powder coating)
O: 4 – 20 mA C: HART PROFIBUS PA
Up to 40 bar (depends on flange and temperature)
-40 to +80 °C
-40 to +80 °C
A: 0.1 %
1 1/2" NPT 1 1/2" BSP ANSI and DIN flanges
ATEX, FM, CSA
24 V DC, 2-wire system
IP68

- Easy installation and simple startup
- Programming using infrared intrinsically safe handheld programmer
- Patented Sonic Intelligence® signal processing
- Extremely high signal-to-noise ratio
- Auto False-Echo Suppression of fixed obstructions
- Uni-Construction polypropylene rod antenna standard
- Various flanges, horn and waveguide antenna options available
- Measuring frequency: 5.8 GHz (6.3 GHz for North America)

General	SITRANS L level instruments		SITRANS F flow-meters
			
	SITRANS LR 300	**SITRANS LR 400**	**MAGFLO MAG 5100 W**
Applications and brief description	Compact 4-wire pulse radar for level measurement of liquids and slurries in process vessels and extreme or hazardous process conditions.	Compact FMCW (Frequency Modulated Continuous Wave) radar (24 GHz) for level and volume measurement of bulk materials such as lime in silos.	Volume flow measurement for groundwater and drinking water with a minimum electrical conductivity of 5 µS/cm. Rugged, fully-welded design, can be upgraded to IP68 on site and buried.
Span/Range	0.4 – 20 m	0.35 – 50 m	0.25 – 10 m/s
Measurement Points all Channel(s)	1	1	1
Wetted parts material **Materials wetted by medium**	PTFE, PP as rod Stainless Steel 316 as horn or (sliding) wave guide antennas	Stainless steel	Hard rubber/composite elastomer Measuring electrodes: stainless steel
Housing materials	Aluminium (epoxy-coated) or stainless steel	Aluminium (epoxy-coated) or stainless steel	Coated carbon steel
I: inputs **O: outputs** **C: communication**	O: 4 – 20 mA C: HART PROFIBUS PA MODBUS	O: 4 – 20 mA C: HART PROFIBUS PA	–
Process pressure, absolute	Up to 40 bar (depends on flange and temperature)	1.5 bar	0.01 to 40 bar (depends on diameter)
Temperature of medium/process	-40 to +200 °C	-40 to +200 °C	-5 to +70 °C
Ambient temperature	-40 to +60 °C	-40 to +65 °C	-40 to +70 °C
A: accuracy **L: long-term stability**	A: ±15 mm from 0.4 to 10 m ±0.15 % from 10 to 20 m	A: < 5 mm from 1 to 10 m < 15 mm from 10 to 50 m	A: 0.5 % or 0.25 %, depends on transmitter L: very good, can be checked with Verificator
Process connections (relevant for water and waste water)	1 1/2" NPT 1 1/2" BSP ANSI and DIN flanges	ANSI and DIN flanges	Nominal diameter: DN 25 to DN 1200 (1" to 48") Connection flanges EN 1092-1 (DIN 2501), ANSI, AWWA and AS
Certificates/approvals (selection)	ATEX, FM, CSA	ATEX, FM, CSA	OIML R 49, WRc, NSF
Power supply	24 – 230 V AC/DC	24 V DC 120 to 230 V AC, 50/60 Hz	Powered by transmitter
Degree of protection	IP67	IP67	IP67/68
Important features	■ Auto False-Echo Suppression ■ Infrared intrinsically safe handheld or remote programming ■ Built-in diagnostics ■ Various flanges, horn, wave guide and sliding wave guide antenna options available ■ Extremely high signal-to-noise ratio ■ Measuring frequency: 5.8 GHz (6.3 GHz for North America)	■ Easy installation and commissioning, low maintenance ■ Self-calibration with internal reference ■ Built-in diagnostics ■ Auto-False Echo Suppression and advanced echo processing ■ Programming using infrared intrinsically safe handheld programmer ■ Measuring frequency 24 GHz FMCW with high signal-to-noise ratio ■ With internal adjustment system for exact alignment of radar cone to filling cone or discharge funnel.	■ Hard lining guarantees consistent accuracy throughout the temperature and pressure range ■ Soft elastomer facing provides high abrasion resistance. ■ Stainless steel integrated grounding and measuring electrodes ■ Increased low flow accuracy for water leak detection, due to coned liner design. ■ Drinking water approvals ■ Suitable for direct burial and constant flooding ■ Build-in length according to ISO 13359 ■ Easy commissioning, SENSORPROM unit automatically uploads calibration values and settings. ■ Designed that patented in-situ verification can be conducted. Using SENSORPROM fingerprint.

MAGFLO MAG 3100

Volume flow measurement for groundwater and drinking water with a minimum electrical conductivity of 5 µS/cm. Rugged, fully-welded design, can be upgraded to IP68 on site and buried.

0.25 – 10 m/s

1

Neoprene, EPDM, ebonite, linatex, PTFE
Measuring electrodes: stainless steel, Hastelloy C-22

Coated carbon steel, stainless steel

–

0.01 to 100 bar (depends on diameter)

-10 to +100 °C (depends on version)

-40 to +100 °C

A: 0.5 % or 0.25 %, depends on transmitter
L: very good, can be checked with Verificator

Nominal diameter: DN 15 to DN 2000 (1/2" to 78")
Connection flanges EN 1092-1 (DIN 2501), ANSI, AWWA and AS

OIML R 75, OIML R 117, WRc, NSF, ATEX, FM, CSA

Powered by transmitter

IP67/68

- Wide pressure range: PN 6 ... PN 100ANSI Class 150/300, AS 2129 / AS 4087.
- Wide range of electrode and liner material to fit even the most extreme process media
- Fully welded construction that suits the toughest applications and environments
- Easy commissioning, the SENSORPROM unit automatically updates settings.
- Designed to allow patented MAGFLO in-situ verification using the SENSORPROM fingerprints.

MAGFLO MAG 1100

Electromagnetic flow sensor in a large variety that meets the demands of almost every flow application.

0.25 – 10 m/s

1

Ceramic liner with Platinum electrodes
PFA liner with Hastelloy C electrodes

Stainless steel AISI 316L (1.4404)

–

Ceramic: 10 – 6 bar to 40 bar (depends on diameter)
PFA: 0.02 to 20 bar

Ceramic: -20 to +200 °C (depends on version)
PFA: -30 to 130 °C

–

A: 0.5 % or 0.25 %, depends on transmitter
L: very good, can be checked with Verificator

Nominal diameter: DN 2 to DN 100 (1/12" ... 4")

ATEX, OIML R 75, OIML R 117, 3A, EHEDG

Powered by transmitter

IP67/68

- Compact wafer design meets EN 1092, DIN and ANSI flange standards
- Corrosion resistant AISI 316 stainless steel sensor housing
- Highly resistant liner and electrodes fitting most extreme process media
- Temperature rating up to 200 °C (390 °F)
- Hose proof IP67/NEMA 4X/6 enclosure rating
- Designed that patented in-situ verification can be conducted. Using SENSORPROM fingerprints.

MAGFLO MAG 5000

Transmitter for flow, volume (forward, backward and net) and error message in plain text.

–

1

–

Fiberglass-reinforced polyamide;
option (only for IP67): stainless steel, AISI 316

I: control input for counter reset 11 – 30 V
O: frequency/pulse output active 24 V; passive 5 – 50 V
0/4 to 20 mA
Relais with AC 42 V, DC 24 V
C: HART

–

–

-20 to +50 °C

A: 0.5 % of measured value including zero point

–

OIML R 49, OIML R 75, OIML R 117

11 – 24 V AC/DC
110/230 V AC 50/60 Hz

IP67

- Superior signal resolution for optimum turn down ratio
- Automatic reading of SENSORPROM data for easy commissioning
- User configurable operation menu with password protection.
- 3 lines, 20 characters display in 11 languages.
- Flow rate in various units
- Totalizer for forward, reverse and net flow as well as additional information available
- Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits)
- Comprehensive self-diagnostic for error indication and error logging
- Batch control

General	SITRANS F flowmeters	
		
	MAGFLO MAG 6000	**MAGFLO MAG 6000 I**
Applications and brief description	Transmitter for flow, volume (forward, backward and net) and error message in plain text.	The SITRANS FM MAGFLO MAG 6000 I/Ex d Industry transmitter is designed for the requirements of the process industry. The rugged die-cast aluminium housing provides exceptional protection, even in the most rugged industrial environment. The complete input and output functionalities are also present in the Ex version. Transmitter for flow, volume (forward, backward and net) and error message in plain text.
Span/Range	–	–
Measurement Points all Channel(s)	1	1
Wetted parts material **Materials wetted by medium**	–	–
Housing materials	Fiberglass-reinforced polyamide; option (only for IP67): stainless steel, AISI 317	Die-cast aluminium housing
I: inputs **O: outputs** **C: communication**	I: control input for counter reset 11 – 30 V O: frequency/pulse output active 24 V; passive 5 – 50 V 0/4 to 20 mA Relais with AC 42 V, DC 24 V C: HART, MODBUS RTU, PROFIBUS PA and DP, CANopen, DeviceNet	I: control input for counter reset 11 – 30 V O: frequency/pulse output active 24 V; passive 5 – 50 V 0/4 to 20 mA Relais with AC 42 V, DC 24 V C: HART, MODBUS RTU, PROFIBUS PA and DP, CANopen, DeviceNet
Process pressure, absolute	–	–
Temperature of medium/process	–	–
Ambient temperature	-20 to +50 °C	-20 to +60 °C
A: accuracy **L: long-term stability**	A: 0.25 % of measured value including zero point	A: 0.25 % of measured value including zero point
Process connections (relevant for water and waste water)	–	–
Certificates/approvals (selection)	ATEX, FM, UL, cUL, C-tick, GOST OIML R 49, OIML R 75, OIML R 117	ATEX, FM, GOST
Power supply	11 – 24 V AC/DC 110/230 V AC 50/60 Hz	Without Ex d: 18 – 90 V DC 115 – 230 V AC 50/60 Hz Ex d: 18 – 30 V DC Ex d: 115 – 230 V AC 50/60 Hz
Degree of protection	IP67	IP67
Important features	■ Superior signal resolution for optimum turn down ratio ■ Automatic reading of SENSORPROM data for easy commissioning ■ User configurable operation menu with password protection. ■ 3 lines, 20 characters display in 11 languages. ■ Flow rate in various units ■ Totalizer for forward, reverse and net flow as well as additional information available ■ Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits) ■ Comprehensive self-diagnostic for error indication and error logging ■ Batch control	■ Full range of ATEX rated flowmeters with intrinsically safe rated input and outputs ■ For compact or remote installation ■ Superior signal resolution for optimum turn down ratio ■ Automatic reading of SENSORPROM data for easy commissioning ■ User configurable operation menu with password protection. ■ 3 lines, 20 characters display in 11 languages. ■ Flow rate in various units ■ Totalizer for forward, reverse and net flow as well as additional information available ■ Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits) ■ Comprehensive self-diagnostic for error indication and error logging ■ Batch control

MAGFLO Verificator

The Verificator checks the operating status of the flowmeter, its agreement with the technical specifications, including the magnetic sensor integrity. The complete acceptance test is carried out fully automatically, and is confirmed by a certificate which, in addition to the details of the acceptance test, also contains the current settings, the flowmeter's serial number and data on the Verificator version.

–
1
–
Plastic case
No external
–
20 °C ±5 K (ideal for calibration)
20 °C ±5 K
–
–
–
24 V, 115 ... 230 V, 50 or 60 Hz
–
Repeatability ±0.1 % of actual flow at V ≥ 0.5 m/s (1.5 ft/s) and conductivity > 10 µS/cm

magnetic water meter MAG 8000

Battery-operated electromagnetic water meter for sampling, distribution, leak locating, billing and irrigation applications.

0.25 – 10 m/s m^3/h depends on nominal diameter
1
Hard rubber/composite elastomer Measuring electrodes: stainless steel
Plastic and stainless steel
O: 2 passive outputs, for pulse volume (forward, reverse and net) and for alarm or call-up function. C: IrDA interface with MODBUS RTU protocol and open communications platform Add-on modules for RS 232 or RS 485 interface
0.01 to 40 bar (size dependent)
0 to +70 °C
-20 to +60 °C
A: 0.4 % (0.2 %) of measured value
Nominal diameter: DN 25 to DN 600 (1" ... 24") DIN 1092-1, ANSI 16.5 and AS 4087 flange
Factory calibration (acc. to ISO/IEC 17025), OIML R 49, WRc, NSF
Internal battery 3.6 V/33 Ah (life: > 5 years) External battery 3.6 V/66 Ah (life: 10 years)
IP67, IP68/NEMA 6P

- Compact or remote solution with factory mounted cable
- Sensor can be buried
- Flexible power supply - internal or external battery pack or mains power supply with battery backup
- Bi-directional measurement
- Long lasting performance/Cost of Ownership
- 6 years operation in typical revenue application
- Robust construction build for the application
- Intelligent information, easy to access on site
- Data logger with up to 26 months of recording and consumption profile
- Alarm when current consumption too high or too low
- Advanced statistics and diagnostics
- Add-on communication module

MASSFLO MASS 2100

Coriolis mass flowmeter with high dynamic response for exact flow, density, mass and temperature measurements as well as dosing of liquids and gases.

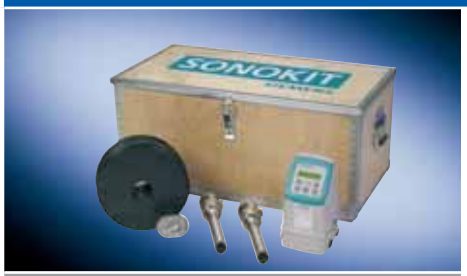
0.25 – 10 m/s 0 – 65 Kg/h (DN 1.5 or 1/16") 0 – 52,000 Kg/h (DN 40 or 11/2")
1
1.4435 stainless steel (AISI 316L) 2.4602 Hastelloy C-22"
1.4404 (AISI 316L) (stainless steel)
Powered from transmitter
0.01 to 400 bar (depends on version)
-50 to +180 °C
-20 to +50 °C
A: better than 0.1 % of mass flow rate
Threaded connections, G 1/4" to G 2" and 1/4" NPT to 2" NPT Flanges DN10 to DN 50 and ANSI 1/2" to ANSI 2"
ATEX
–
IP66

- Large dynamic turn down range better than 500:1
- Density accuracy better than 0.001 g/cm^3
- Single tube without internal welds, reductions or flow splitters
- Market's biggest wall thickness, ensuring optimal lifetime, corrosion resistance and high pressure durability
- Balanced pipe design ensures optimal performance and stability under non ideal and unstable process conditions (pressure, temperature, densitychanges etc.)
- 4-wire Pt 1000 temperature measurement ensures optimum accuracy on mass flow, density and fraction flow
- Multi-plug electrical connector & SENSORPROM enables true plug & play. Installation and commissioning in less than 10 min.
- Intrinsically safe EEx ia design as standard
- High pressure program as standard
- The sensor calibration factor is also valid for gas measurement

General	SITRANS F flowmeters	
		
	MASSFLO MASS 6000	**SONOFLO SONO 3100**
Applications and brief description	Transmitter for flow, volume (forward, backward and net) and error message in plain text. The MASS 6000 transmitter provides exact multi-parameter measurements of mass flow, volume flow, density, temperature and fractional flow.	The combination of SONO 3100 sensor and SONO 3000 transmitter is ideal for applications whose processes cannot be shut down for maintenance and in which extremely high or low temperatures and pressures occur. The acoustic converters can be easily replaced without interrupting operation. A 4-track version is also available for maximum demands.
Span/Range	–	0.5 – 10 m/s
Measurement Points all Channel(s)	1	1
Wetted parts material **Materials wetted by medium**	–	Carbon steel or stainless steel
Housing materials	Fiberglass-reinforced polyamide; option: stainless steel	Carbon steel or stainless steel
I: inputs **O: outputs** **C: communication**	I: Digital input 11 – 30 V DC O: 4 – 20 mA pulse/frequency relay output C: HART, Profibus PA, Profibus DP, Modbus, DeviceNet, CANopen	–
Process pressure, absolute	–	0.01 to 40 bar (size dependent)
Temperature of medium/process		-10 to +200 °C
Ambient temperature	-20 to +50 °C	-20 to +200 °C
A: accuracy **L: long-term stability**	A: typical = < 0.1 % of measured flow	A: < ±0.5 % of the measured value (for velocity above 0.5 m/sec)
Process connections (relevant for water and waste water)	–	DN 100 to DN 1200 DIN flange ANSI 4" to 48"
Certificates/approvals (selection)	ATEX	ATEX
Power supply	24 V AC/DC 115/230 V AC 50/60 Hz	Powered from transmitter
Degree of protection	IP67/NEMA 4X	IP67/68
Important features	■ Front end resolution better than 0.35 ns improves zero point stability and enhances dynamic turn down ratio on flow and density accuracy ■ Superior noise immunity due to a patented DFT (Discrete Fourier Transformation) algorithm ■ Multi parameter outputs, individual configurable for mass flow, volume flow, density, temperature or fraction flow such as °BRIX or °PLATO ■ Fast batching and flow step response with an update rate of true 30 Hz ■ All outputs can be forced to preset value for simulation, verification or calibration purposes ■ User configurable operation menu with password protection ■ 3 lines, 20 characters display in 11 languages ■ Self explaining error handling/log in text format ■ SENSORPROM technology automatically configures transmitter at start up providing: ■ Advanced diagnosis and service menu enhances trouble shooting and meter verification	■ Replaceable transducers under pressure ■ Measure on all liquids less than 350 Cst, conductive or non conductive ■ No pressure drop ■ Reliable and accurate flow measurements ■ Long time stability ■ On request: - Special sensor material, e.g. Duplex - High/low temperature sensor version: +250 °C (+482 °F) / -200 °C (-382 °F) sensors - Pressure rating 430 bar (6235 psi) - 4 track sensor technology

SITRANS F flowmeters

SITRANS P measuring instruments for pressure



SONOFLO SONOKIT

SONOKIT is a transit time based ultrasonic flowmeter for retrofitting on existing pipelines. The set is designed for installation on empty pipes or pipes under pressure, and for installation as a 1- or 2-path flowmeter. The acoustic converters are present in the flow (wetted by the medium), and the accuracy and performance are therefore significantly superior than with Doppler or attached flowmeters.

0.5 – 10 m/s

1

Stainless Steel SS 316

Fiberglass-reinforced polyamide

O: 0/4 – 20 mA
pulse output

Max. 40 bar

-20 to +200 °C

-20 to +55 °C

A: <(±0.5 % ...1.5 %) of the measured value depending on the installation conditions.

DN 100 to DN 4000
(4" – 160")

ATEX

24 V AC/DC
115 to 230 V AC, 50/60 Hz

IP68

- Cost-effective solution – contains all the necessary components for retrofitting
- SONOKIT is easy to install in pipeline sizes DN 100 to DN 4000 (4" to 160") – without process shut-down or flow interruption
- High accuracy – the bigger the pipe, the more accurate the result
- Solid construction and no moving parts for a 100 % maintenance and obstruction free flowmeter
- Available in a robust version that can be buried and withstands constant flooding
- Wetted transducers assure superior accuracy and performance compared to Doppler and clamp-on flowmeters
- Automatic calculation of the calibration factor when pipe geometry data are entered in the transmitter

SONOFLO SONO 3000

The SONO 3000 is a transit time based transmitter which is designed for ultrasonic flow measurements in any pipes of the SONO series up to nominal diameters of DN 4000. It is a high-performance unit, and offers simple installation, commissioning and maintenance. It is available for flowmeters with 1, 2 or 4 tracks.

–

1

–

Fiberglass-reinforced polyamide;
option: stainless steel

O: 0/4 – 20 mA
pulse/frequency
relay output

–

–

-20 to +55 °C

A: < ±0.5 % of the measured value (for velocity above 0.5 m/sec)

–

ATEX, PTB Class C, OIML R 75 Class 4

24 V AC/DC
115 to 230 V AC, 50/60 Hz

IP65/67

- High signal resolution for optimum turn down ratio
- Unique correlation signal ensures realiable signal detection
- Digital processing with many possibilities
- Automatic reading of SENSORPROM data for easy commissioning
- User configurable operation menu with password protection
- Multiple functional output for process control, minimum configuration
- Pulse/frequency and relay output (status, flow direction, limits)
- Comprehensive self diagnostic for error indication and error logging
- Custody transfer approval

SITRANS P DS III Series

Digital transmitters for measuring pressure, absolute pressure, differential pressure, flow and level at high accuracy and with comprehensive diagnostics functions.

1 mbar to 400 bar

1

Stainless steel, Hastelloy, ...

Plastic, aluminium, stainless steel

O: 4 – 20 mA
C: HART
PROFIBUS PA
Foundation Field Bus

Up to 400 bar

-40 to +100 °C

-40 to +85 °C

A: 0.075 % of full-scale value
L: 0.25 %/5 years

Flange and screw connections

ATEX, FM, CSA, NEPSI

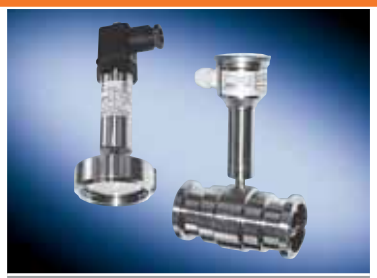
12 – 24 V DC, 2-wire system

IP65 or IP68

- High reliability even under extreme chemical and mechanical loads
- Extensive diagnosis and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Infinitely adjustable span from 0.01 mbar to 400 mbar for DS III with HART communication
- High measuring accuracy
- Parameterization over control keys and several interfaces
- Various versions of the DS III pressure transmitters are available for measuring:gage pressure, absolute pressure, differential pressure, filling level, mass level, volume level, volume flow, mass flow

General

SITRANS P measuring instruments for pressure



	SITRANS P 300	SITRANS P Compact	SITRANS P Series ZD
Applications and brief description	The SITRANS P 300 is a digital transmitter for relative and absolute pressures, process pressure and level.	The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology sectors. The use of high-quality materials guarantees compliance with hygiene regulations. It is suitable for measurement of relative and absolute pressures, process pressure and level.	The SITRANS P pressure transmitter, Series ZD, is used to measure relative and absolute pressures or the level of liquids and gases. It is used to display and control the measured pressure at the installation point. The ZD pressure transmitter is available in axial and radial designs.
Span/Range	1 mbar to 400 bar	1 mbar to 40 bar	0.4 bar to 400 bar
Measurement Points all Channel(s)	1	1	1
Wetted parts material Materials wetted by medium	Stainless steel, Hastelloy	Stainless steel	Stainless steel Seal diaphragm Al2O3 96 %
Housing materials	Stainless steel	Stainless steel	Stainless steel Seal diaphragm Ceramic (Al2O3 96 %)
I: inputs O: outputs C: communication	O: 4 – 20 mA C: HART PROFIBUS PA	O: 4 – 20 mA	O: 4 – 20 mA
Process pressure, absolute	Up to 400 bar	Up to 40 bar	Up to 400 bar
Temperature of medium/process	-40 to +150 °C	-30 to +200 °C (depends on design)	-30 to +100 °C
Ambient temperature	-40 bis +100 °C	-40 to +85 °C	-25 to +85 °C
A: accuracy L: long-term stability	A: 0.075 % L: 0.25 %/5 years	A: 0.2 % of full-scale value L: 0.1 %/1 year	A: 0.25 % of full-scale value L: 0.25 %/1 year
Process connections (relevant for water and waste water)	Flange and screw connections	Flange and screw connections	G1; G 1/2 B (M); G1/4; G 1/8 B (F), NPT 1/2 -1/4 (F) stainless steel screw connections
Certificates/approvals (selection)	ATEX, FM, CSA	ATEX	–
Power supply	12 – 24 V DC, 2-wire system	12 – 24 V DC, 2-wire system	12 – 30 V DC, 2-wire system
Degree of protection	IP65 or IP68	IP65	IP65
Important features	■ High quality and long life ■ High reliability even under extreme chemical and mechanical loads ■ Extensive diagnosis and simulation functions ■ Minimum conformity error ■ Small long-term drift ■ Wetted parts made of high-grade materials (such as stainless steel, Hastelloy) ■ Measuring range 8 mbar ... 400 bar ■ High measuring accuracy ■ Parameterization over control keys and several interfaces	–	■ For aggressive and non-aggressive gases, vapors and liquids ■ Max. Turn-down 10:1 ■ Parametrisation with 3 Buttons

SITRANS P measuring instruments for pressure

SITRANS T measuring instruments for temperature

SITRANS P Series Z	SITRANS P Series MPS	SITRANS T sensors	SITRANS TK/ TK-H/T3K PA	SITRANS TF
The SITRANS P pressure transmitter, Series Z, measures relative and absolute pressures as well as the level of liquids and gases.	Pressure transmitter for measuring hydrostatic pressure. It consists of an IP68 stainless steel housing (27 mm diameter) with a piezoresistive sensor and stainless steel diaphragm. A capillary line is integrated in the 2-core Kevlar cable (8.3 mm diameter).	Temperature sensors (Pt 100 or thermocouples) optionally with direct monted temperature transmitter.	Temperature transmitter to connect with resistance thermometers, resistancebased sensors, thermocouples or voltage-based sensors. They which convert the sensorsignal into a standardized signal.	Temperature transmitter with field housing for connection of resistance thermometers, resistance-based sensors, thermocouples or voltagebased sensors, which converts the signal into a standardized signal, if the environment conditions are to harsh for direct mounting, or good access is needed.
0.1 bar to 400 bar	0 – 2 m WC up to 0 – 200 m WC	-200 to +1250 °C	-200 to +2300 °C (depends on sensor)	-200 to +2300 °C (depends on sensor)
1	1	1	1	1
Viton, Stainless steel, Seal diaphragm Ceramic (Al_2O_3 96 %) for pressure > 1 bar and Stainless Steel for pressure < 1bar	Stainless steel, Viton, PE cable	Stainless steel, high-temperature steel	–	–
Stainless steel	Stainless steel	Plastic, aluminium, stainless steel	rail mounting	Aluminium, stainless steel
O: 4 – 20 mA 0 – 10 V	O: 4 – 20 mA	O: Ohmic impedance (From Pt 100 elements), temperature dependent mV (DC voltage) from thermocouple, temperature dependent 4 – 20 mA C: HART Profibus PA	O: 4 – 20 mA C: HART PROFIBUS PA	O: 4 – 20 mA C: HART
Up to 400 bar	Up to 20 bar	Up to 450 bar	–	–
-30 to +120 °C	-10 to +80 °C	-200 to +1250 °C	-200 to +2300 °C (depends on sensor)	-200 to +2300 °C (depends on sensor)
-25 to +85 °C	-10 to +80 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
A: 0.25 % of full-scale value L: 0.3 %/1 year	A: 0.3 % of full-scale value L: 0.2 %/1 year	A: Calibration and error limits confirms to DIN EN 60 751 and DIN EN 60584, Part 1. Class A or B, Class 1 or 2	A: < 0.1 °C +0.1 % of span	A: < 0.1 °C +0.1 % of span
G1; G1/2; G1/4; div. NPT	Lowered in the well with a cable hanger, no process connection required	Threaded connections, flange connections, welded connections	–	–
ATEX	ATEX	ATEX	ATEX	ATEX
10 – 36 V DC, 2-wire system	10 – 36 V DC, 2-wire system	Powered from transmitter	12 – 24 V DC, 2-wire system	12 – 24 V DC, 2-wire system
IP65	IP68	IP54 or IP65	IP65 or IP68	IP65 or IP68
■ For aggressive and non-aggressive gases, vapors and liquids	–	■ Available for many different applications ■ Special solutions on request	–	■ Remote operation ■ Digital display as option ■ Without transmitter, as field indicator available for every 4 – 20 mA signal

General	SITRANS T measuring instruments for temperature	Electropneumatic positioners	Process controllers
			
	SITRANS TF2	**SIPART PS2**	**SIPART DR**
Applications and brief description	Digital display thermometer combines a Pt 100 sensor in stainless steel tube with a transmitter and an LCD for measurement of vapors and liquids. Simple configuration using pushbuttons.	Intelligent electropneumatic positioners for pneumatic linear and rotary actuators.	For open-loop and closed-loop control of simple and interconnected loops in the process industry. With up to 11 analog inputs and 9 analog outputs. The most significant controller types as well as basic and complex functions are stored in the controllers.
Span/Range	-50 to +200 °C	Angle of rotation: 0 – 30/100 ° Stroke: 3 – 130 mm	0/4 – 20 mA
Measurement Points all Channel(s)	1	1	0 – 4 control loops (closed loops)
Wetted parts material Materials wetted by medium	Stainless steel	–	–
Housing materials	Stainless steel	Plastic, aluminium, stainless steel	Housing: polycarbonate Front: polyester
I: inputs O: outputs C: communication	O: 4 – 20 mA	I: 0/4 – 20 mA O: 4 – 20 mA O: alarms and fault message C: HART PROFIBUS PA Foundation Field bus	I: 0/4 – 20 mA (up to 11) Option: TC/RTD/R O: 0/4 – 20 mA (up to 9) C: RS232/RS485 PROFIBUS DP
Process pressure, absolute	Up to 40 bar	–	–
Temperature of medium/process	-50 to +200 °C	–	–
Ambient temperature	-25 to +85 °C	-30 to +80 °C	0 to 50 °C
A: accuracy L: long-term stability	A: < ±0.45 K +0.2 % of full-scale value in K +1 digit in K	–	–
Process connections (relevant for water and waste water)	G1/2B without neck tube	Compressed air: G1/4 or 1/4 NPT Mounting on valve/drive: acc. to IEC 534-6/NAMUR	–
Certificates/approvals (selection)	–	ATEX, FM, CSA	TÜV certificate VdTÜV Wasserstand 100 DIN test and monitoring marking as temperature controller
Power supply	10 – 36 V DC, 2-wire system	Up to 7 bar compressed air 4 – 20 mA, 2-wire system 24 V DC, 3/4-wire system	24 V AC/DC 115/230 V AC
Degree of protection	IP65	IP66	Front: IP64
Important features	■ Integrated display ■ Integrated transmitter ■ High class stainless steel housing ■ Simple configuration without external software	■ Simple installation and automatic commissioning (self-adjustment of zero and span) ■ Simple Local operation and configuration of the device ■ Very high-quality control thanks to an online adaptation procedure ■ Negligible air consumption in stationary operation ■ "Tight shut-off" function (ensures maximum positioning pressure on the valve seat) ■ Extensive diagnosis functions for valve and actuator ■ For linear and part-turn actuators ■ Insensitive to vibrations	Fixed control structures for fast commissioning, freely-programmable for complex applications (DR22/DR24) Analog and digital displays for setpoint and actual value Statuses/alarms on LEDs

Recorders

SIREC D display recorder

Display recorder with up to 32 inputs and high scanning rate for electronic recording, evaluation and archiving of process data.

0/4 – 20 mA, TC, RTD

6 to 32

–

Steel, plastic

I: Universal (up to 32)
O: 4 – 20 mA (up to 4)
C: Ethernet

–

–

0 to 50 °C (depends on device)

A: 0.1 %

–

–

24 V DC
90 – 250 V AC

IP54

- Data exchange over LAN or Internet based on web server function;
- High-resolution TFT color display;
- Data compression based on fuzzy technology;
- Fast scanning rate for all channels and selective logging rate and logging mode per channel;
- Multi-level password protection and logbook function;
- Various high-performance software tools are available as options for parameter setting, real-time display, evaluation and archiving

SIREC L/P paper recorder

Paper recorder for recording process variables; as line recorder with max. 3 analog inputs, as multipoint recorder with max. 6 analog inputs.

±20 mA; ±10 V; TC; RTD

1,2,3,6

–

Steel, plastic

I: universal (up to 6)
O: up to 6 (binary or relay)
C: RS 232

–

–

1 to 50 °C

A: 0.5 %

–

–

24 V AC/DC
115/230 V AC

IP54

Can be parameterized using Simatic PDM

Process gas analytics

ULTRAMAT 6

Gas analyzer for combined measurement of oxygen and IR-absorbing gases (methane and carbon dioxide).

Oxygen: 0 – 5/100 %
CO_2/CH_4: 0 – 10/100 %

1 (3 gas concentrations)

Stainless steel

Plastic, aluminium, stainless steel, others on request

O: 4 – 20 mA
C: RS 485 (SIPROM GA)
PROFIBUS PA
PROFIBUS DP

600 to 1500 mbar

0 to 50 °C

+5 to +45 °C

< 1 % of measuring range per 10 K change in temperature

Pipe, 6 mm outer diameter

ATEX

200 to 240 V AC; 48 to 63 Hz

IP20

- AUTOCAL with ambient air (depends on measured component) High efficiency so no calibration gas and accessories required
- High selectivity by multiple layer detectors; small cross sensitivity
- Easy to clean sample cells; reduced maintenance cost for further use in case of pollution
- Menu-assisted operation in plain text; operation control without manual, high operational safety
- Service information and log book, preventive maintenance; help for service and maintenance persons

Communication and software

SIMATIC PDM Process Device Manager

SIMATIC PDM (Process Device Manager) is a universal, crossvendor tool for configuration, parameterization, commissioning, diagnostics and servicing of intelligent field devices and field components. SIMATIC PDM makes it possible to use one software to configure a wide variety of field devices from different vendors under one uniform user interface. Process device data can then be set, modified, checked for plausibility, managed and simulated without problem. In addition, selected process values, alarms and status signals of devices can be monitored online.

–

Unlimited, depends on license

–

–

C: HART
PROFIBUS

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Core functions:
- Adjustment and modification of device parameters
- Comparison of reference and actual parameter settings
- Input check for plausibility
- Simulation
- Diagnostics
- Administration
- Commissioning functions, e.g. channel tests for process data
- Lifelist
- Protocol functions

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