

SITRANS LR500 series

Overview



SITRANS LR500 series are 80 GHz radar level transmitters for continuous monitoring of liquids, slurries, and solids in storage and process vessels including high temperature and pressure, to a range of 120 m (393 ft).

Benefits

- Continuous level measurement up to 120 m (393 ft)
- Easy installation and simple startup
- Programming using 4-button HMI, mobile IQ app using Bluetooth, or SIMATIC PDM
- IQ Guard for health monitoring, NE107 diagnostic messaging and quality verification report
- Communication using HART 7
- Graphical HMI with echo profile display and backlight
- Near Range Suppression for automatic detection and suppression of material build up noise
- Process Intelligence signal processing
- 1 mm accuracy in accordance with IEC 60770-1
- Suitable for API 2350
- Auto False Echo Suppression for fixed obstruction avoidance
- Low power consumption with EPD (environmental product declaration)
- Optional SLOD (second line of defense) for toxic material safety
- 100 000 points of data logging memory for process control analysis and optimization

Application

SITRANS LR500 series radar level transmitters include a graphical local user interface that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support.

The 80 GHz frequency creates a narrow, focused beam allowing for smaller antenna and decreasing sensitivity to obstructions.

SITRANS LR500 series radar level transmitters measure superbly on low dielectric media with high accuracy and repeatability. A very fast measurement response is ideal for process control applications.

- Key Applications: SITRANS LR500 Radar level transmitters are available with four antenna types for level measurement of liquid, slurry, and solid materials:
 - Threaded lens antenna
 - Flanged encapsulated antenna
 - Polymeric horn antenna
 - Flanged lens antenna

Selection and ordering data

	Article No.
SITRANS LR500 Series Continuous, non-contact, 120 m (394 ft) range, for liquids, slurries, and solids in storage and process vessels, including high temperature and pressure.	
Antenna versions	
Threaded lens antenna	7ML751.....
Flanged encapsulated antenna	7ML753.....
Polymeric horn antenna	7ML755.....
Flanged lens antenna	7ML758.....

Technical specifications

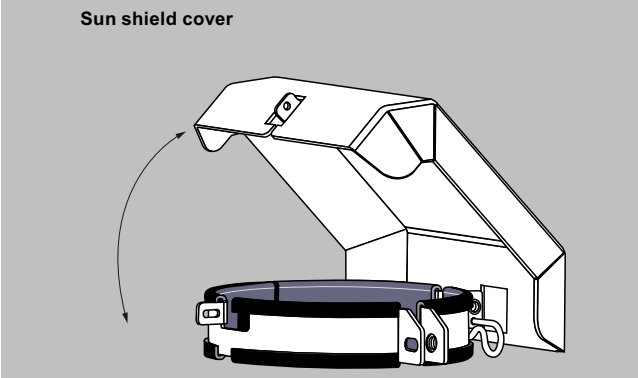
SITRANS LR500 Series	
Mode of operation	
Measuring principle	Radar level measurement
Frequency	W band (80 GHz nominal)
Minimum detectable distance	0 mm from end of the antenna (antenna dependent, reference conditions)
Maximum measuring range	120 m (394 ft), antenna dependent
Output	
HART	Version 7
• Analog output	4 ... 20 mA
• Fail-safe	Programmable as high, low, or hold (loss of echo)
• Update time	Up to 3 measurements per second
Performance (according to reference conditions IEC60770-1)	
Maximum measured error	1 mm (0.039 inch)
Influence of ambient temperature	Less than 3 mm/10 K and maximum ±5 mm over full range from -40 ... +80 °C (-40 ... +176 °F) API 3.1B Inventory
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ϵ_r	> 1.6, antenna and application dependent
Process temperature	-196 ... 250 °C (-321 ... 482 °F), antenna and seal dependent
Process pressure	Up to 40 bar g (580 psi g), process connection and temperature dependent.
Design	
Weight	Range from 2 ... 20 kg (4.4 ... 44.1 lb), version dependent
Enclosure	
• Material	Aluminum, polyester powder-coated, C5 corrosion equivalent
• Cable inlet	2 x M20 x 1.5 or 2 x ½" NPT
Degree of protection	Type 4X, Type 6, IP66, IP68
Display (local)	Optional graphical HMI with NE107 diagnostic data, echo profile display and backlight
Trend Logging	100 000 points, up to 8 variables including level, distance, space, volume, signal strength, confidence, temperature
Limit Monitoring	Min/Max of 3 variables with count function
Terminal voltage	Available from HMI or EDD
Asset management	Diagnostic logbook, parameter change logbook
Power supply	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 800 Ω
Certificates and approvals	
Ordinary locations	FM, cCSA _{US} , CE
Radio	CE, FCC, IC, RCM

Technical specifications (continued)

Hazardous areas	ATEX, IECEx, UKCA Intrinsically Safe Ex ia IIC T6 Ga ATEX, IECEx, UKCA Intrinsically Safe Ex ia IIIC Txx°C Da ATEX, IECEx, UKCA Dust Ignition proof Ex ta IIIC Txx°C Da ATEX, IECEx, CSA, FM, UKEX, NEPSI, PESO, INMETRO EX II 1GD EX ia IIC T6 ... T4 Ga Ex ia IIIC T ₂₀₀ 95 °C Da Ta Ex ta IIIC T ₂₀₀ 137 °C Da CSA/FM Intrinsically Safe Ex ia Class I, II, III, Div 1, Groups A, B, C, D, E, F, G T6 CSA/FM Non-Incendive Class I, Div. 2, Groups A, B, C, D T6
Materials	3.1 of EN 10204, NACE MR 0175 and MR 0103, 2.2 of EN 10204, PMI CRN, PED
Pressure	Canadian Registration Number (CRN) Note: CRN is not applicable for process temperatures below -40 °C (-40 °F).
• British Columbia	0F7424.1
• Alberta	0F22399.2
• Saskatchewan	0F7424.13
• Manitoba	0F7424.14
• Ontario	0F7424.15
• Quebec	0F07424.16
• Atlantic Canada and Territories	0F1384.9870YNT
Materials	3.1 of EN 10204, NACE MR 0175 and MR 0103, 2.2 of EN 10204, PMI
Programming	
PC	SIMATIC PDM
Display (local)	Optional graphical HMI with NE107 diagnostic data, echo profile display and backlight
SITRANS mobile IQ app	Optional AW050 Bluetooth module, for non-hazardous applications only

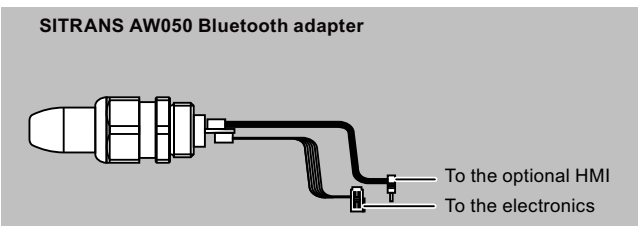
Options

Sun shield cover



SITRANS LR500 series sunshield

SITRANS AW050 Bluetooth adapter

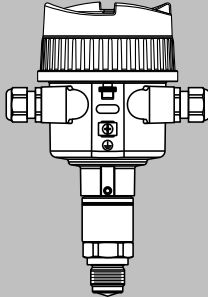


SITRANS AW050 Bluetooth adapter

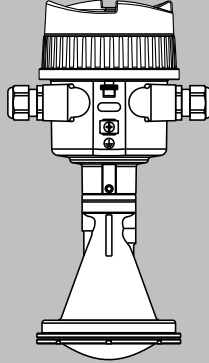
Dimensional drawings

SITRANS LR500 series antenna versions

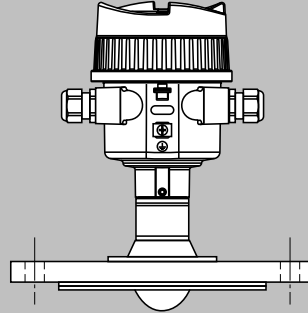
Thread with integrated antenna system



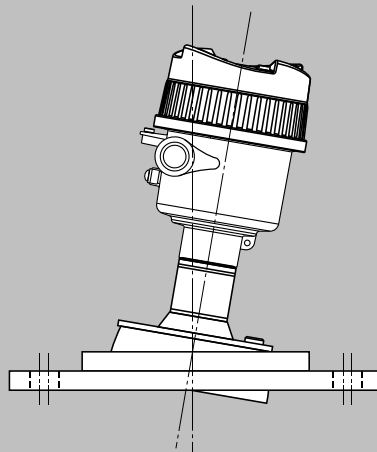
Plastic horn antenna



Flange with encapsulated antenna system



Flange with lens antenna



SITRANS LR500 Series antenna versions

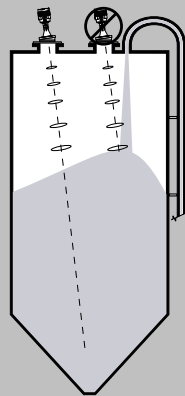
Overview



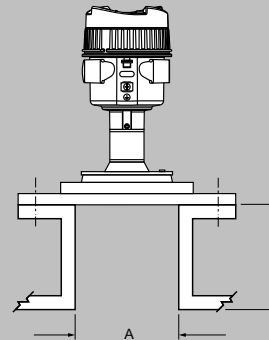
SITRANS LR580 lens antenna provides continuous monitoring of solids or liquids to a range of 120 m (394 ft). The design includes an aimer feature as well as integrated air purge connection for inventory measurement applications in silos. It is also well suited to high temperature applications in the cement and power industries.

Configuration

Installation of SITRANS LR580



SITRANS LR580 nozzle mounting restrictions



Nozzle diameter "A"		Nozzle height "B"	
80 mm	3"	≤400 mm	≤15.8"
100 mm	4"	≤500 mm	≤19.7"
150 mm	6"	≤800 mm	≤31.5"

SITRANS LR580 Nozzle installation

Selection and ordering data

SITRANS LR580 Flanged lens antenna Continuous, non-contact, 120 m (394 ft) range, for solids or liquids.		Article No. 7ML758 ● - ● ● ● ● 0 - ● ● ● ●									
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.											
Communications											
4 ... 20 mA, HART											0
Sealing material of the antenna/process connection											
PEEK / FKM / -40 ... +150 °C (-40 ... +302 °F)											0
PEEK / FKM / -40 ... +200 °C (-40 ... +392 °F)											1
PEEK / FFKM / -15 ... +250 °C (-4 ... +482 °F)											2
Process connection type and material											
Flanges											
DN80 PN16, flat face, 316/316L								P		C	
DN100 PN16, flat face, 316/316L								P		D	
DN150 PN16, flat face, 316/316L								P		E	
3" 150lb, FF, 316/316L								Q		C	
4" 150lb, FF, 316/316L								Q		D	
6" 150lb, FF, 316/316L								Q		E	
DN80 10K, FF, JIS / 316/316L								R		C	
DN100 10K, FF, JIS / 316/316L								R		D	
DN150 10K, FF, JIS / 316/316L								R		E	
Aiming flanges											
Universal DN100/4", 316/316L								E		D	
Universal DN150/6", 316/316L								E		E	
Second line of defense (SLOD) gas tight seal											
SLOD not included											0
SLOD included											1
Enclosure											
Single compartment enclosure											4
Type of protection											
Non Ex - General purpose											A
Intrinsically safe Ex ia / IS (Class I, II, III, Division 1) ¹⁾											B
Non-incendive (Class I, Division 2) ²⁾											D
Dust Ignition proof, Ex t / DIP (Class II, Division 1) ¹⁾⁴⁾											M
Electrical connection											
M20											F
½" NPT											K
Local HMI											
None, with blind lid											0
Included, with blind lid											1
Included, with window lid											3

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Test certificates	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 - performance	C11
Inspection certificate EN 10204-3.1, material	C12
Inspection certificate EN 10204-3.1, material with NACE MR0175 and MR0103	C13
Test report EN 10204-2.2, material	C14
Test report EN 10204-3.1, PMI test - XRF (X-Ray Fluorescence)	C15

Selection and Ordering data	Order code
Tagging	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	
Tag (device parameters, max. 27 characters), plate, stainless steel 304/1.4301	Y15
Regional Ex Approval ³⁾	
NEPSI (China)	E27
ATEX (Europe), IECEx (International), and UKEX (Great Britain)	E47
CSA (Canada) and FM (USA)	E48
ATEX (Europe), IECEx (International), UKEX (Great Britain), CSA (Canada), and FM (USA)	E49

Selection and ordering data (continued)

Selection and Ordering data	Order code
Process connection specials	
Non-return valve for purging air connection ⁵⁾	J01
Operating instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processin-strumentation/	
Accessories	
Sun shield cover	A5E52107153
AW050 Bluetooth module kit, M20 (General purpose only)	A5E51857118
AW050 Bluetooth module kit, 1/2"NPT (General purpose only)	A5E52095588
Lightning Arrestor M20	7MF7903-7AB
Lightning Arrestor 1/2" NPT	7MF7903-7AC
Mounting bracket, 300 mm	A5E52885008
SIMATIC RTU3010C compact, remote data manager with alarming	6NH3112-0BA00-0XX0
SIMATIC RTU3030C compact, remote data manager with alarming	6NH3112-3BA00-0XX0

Selection and Ordering data	Order code
Intrinsically Safe barrier	7NG4124-1AA00
SITRANS RD100, loop powered display	7ML5741-.....-
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices	7ML5742-.....-
SITRANS RD200, universal input display with Modbus conversion	7ML5740-.....-
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion	7ML5744-.....-
SITRANS LT500, a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.	7ML60..-.....-
For applicable back up point level switch - see point level measurement catalog	
Spare parts	
Electronic module, LR530, LR550, LR580, >DN50 / 2 inch, mA/HART	A5E53276249
LR500 lid with window, Non-Exd/XP	A5E53276250
LR500 no window, Non-Exd/XP	A5E53276252
HMI graphical display, with interconnection cable	A5E53276247

- 1) Available only with one -Z Regional hazardous Approval options.
- 2) Available only with -Z Regional hazardous Approval option E48.
- 3) Not available with Type of Protection option A.
- 4) Available only with Second line of defense gas tight seal option 1.
- 5) Must be selected if Type of protection is option B, C, D, or M.

Technical specifications

SITRANS LR580	
Mode of operation	
Recommended measuring range	Beam angle 3°: 120 m (394 ft)
Medium conditions	
Process temperature	<ul style="list-style-type: none"> • PEEK/FKM: -40 ... +150 °C (-40 ... +302 °F) • PEEK/FKM, thermal extension: -40 ... +200 °C (-40 ... +392 °F) • PEEK/FFKM, thermal extension: -15 ... +250 °C (-4 ... +392 °F)
Process pressure	-1 ... 3 bar max.
Design	
Flange material	316/316L
Wetted materials	
• Antenna lens	PEEK
• Antenna seal	FKM/FFKM
Process connections	<ul style="list-style-type: none"> • DN80 PN16, flat face • DN100 PN16, flat face • DN150 PN16, flat face • 3" 150 lb, flat face • 4" 150 lb, flat face • 6" 150 lb, flat face • DN80 10K, flat face, JIS • DN100 10K, flat face, JIS • DN150 10K, flat face, JIS • Aiming flange universal DN100/4" • Aiming flange universal DN150/6"