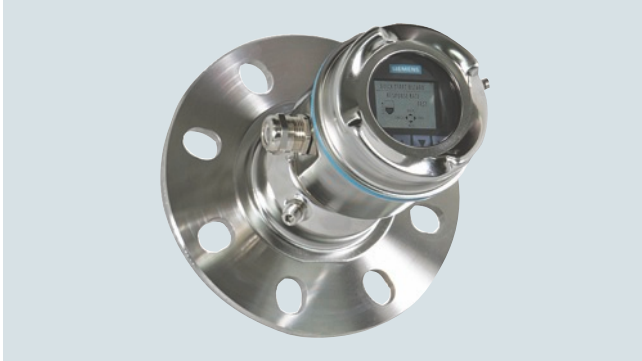


Overview



SITRANS LR560 2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids and liquids to a range of 100 m (328 ft).

Benefits

- Rugged stainless steel design for industrial applications
- 78 GHz high frequency provides very narrow beam, virtually no mounting nozzle noise, and optimal reflection from sloped solids
- Aimer option to direct beam to area of interest, such as draw point of cone
- Lens antenna is highly resistant to product buildup
- Air purge connection is included for self-cleaning of extremely sticky solids
- Local display interface (LDI) allows local programming and diagnostics

Application

SITRANS LR560's plug and play performance is ideal for most solids applications and long range liquid applications, including those with extreme dust and high temperatures to 200 °C (392 °F). Unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR560 includes an optional graphical local display interface (LDI) that improves setup and operation using an intuitive Quick Start Wizard, and echo profile display for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

SITRANS LR560 measures practically any solids material to a range of 100 m (328 ft).

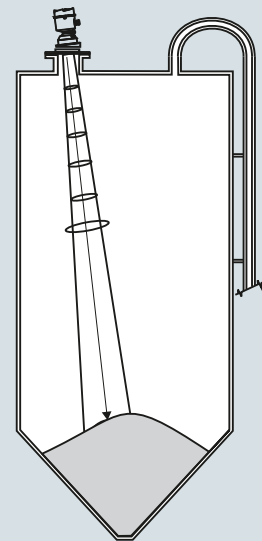
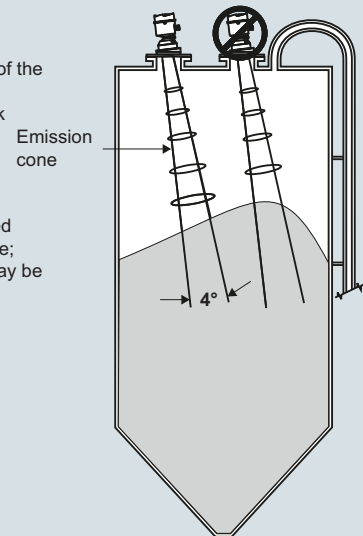
- Key Applications: cement powder, plastic powder/pellets, grain, coal, wood powder, fly ash

Configuration

Installation

Note:

- Beam angle is the width of the cone where the energy density is half of the peak energy density
- The peak energy density is directly in front of and in line with the antenna
- There is signal transmitted outside of the beam angle; therefore false targets may be detected



SITRANS LR560 installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement
Radar level transmitters

SITRANS LR560

Technical specifications

Mode of operation

Measuring principle	Radar level measurement
Frequency	78 GHz FMCW
Minimum detectable distance	400 mm (15.75 inch) from sensor reference point
Maximum measuring range ¹⁾	<ul style="list-style-type: none"> • 40 m (131 ft) version • 100 m (328 ft) version

Output

Analog output	4 ... 20 mA
Communications	<ul style="list-style-type: none"> • HART • Optional: PROFIBUS PA
Fail-safe	<ul style="list-style-type: none"> • Programmable as high, low or hold (Loss of Echo) • NE43 programmable

Performance (according to reference conditions IEC60770-1)

Maximum measured error (including hysteresis and non-repeatability) ²⁾	5 mm (0.2 inch)
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Rated operating conditions (according to reference conditions IEC60770-1)

Installation conditions	Indoor/outdoor
<ul style="list-style-type: none"> • Location 	
Ambient conditions (enclosure)	
<ul style="list-style-type: none"> • Ambient temperature • Storage temperature • Installation category • Pollution degree 	-40 ... +80 °C (-40 ... +176 °F) -40 ... +80 °C (-40 ... +176 °F) I 4

Medium conditions

Dielectric constant ϵ_r	> 1.6
Process temperature and pressure	See chart below

Design

Enclosure	316L/1.4404 stainless steel M20 x 1.5, or 1/2" NPT via adapter 1/8" NPT, 30 cfm at max. 100 psi <ul style="list-style-type: none"> • 40 m version: PEI • 100 m version: PEEK Damage to lens could result from continuous purging/cleaning (due to abrasive solids). Recommended to purge/clean only a few seconds every hour.
<ul style="list-style-type: none"> • Construction • Conduit entry • Purge inlet • Lens material 	
<ul style="list-style-type: none"> • Degree of protection • Weight • Optional local display interface 	Type 4X/NEMA 4X, Type 6/NEMA 6, IP68 3.15 kg (6.94 lb) including 3 inch flange Graphic LCD, with bar graph representing level
Process connections	
<ul style="list-style-type: none"> • Universal flat-faced flanges³⁾ 	<ul style="list-style-type: none"> • 3, 4, 6 inch/80, 100, 150 mm, 304 stainless steel • 3, 4, 6 inch/80, 100, 150 mm, 316L/1.4404 or 316L/1.4435 stainless steel
<ul style="list-style-type: none"> • Aimer flanges³⁾ 	3, 4, 6 inch/80, 100, 150 mm, polyurethane powder-coated cast aluminum

Power supply

4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
PROFIBUS PA	13.5 mA 9 ... 32 V DC, per IEC 61158-2

Certificates and approvals

General	cCSA _{US} , CE, UKCA, FM
Radio	Europe (RED), FCC, Industry Canada, RCM
Hazardous	
<ul style="list-style-type: none"> • Europe / UK / International 	ATEX II 1 D 1/2 D 2 D Ex ta IIIC T139°C Da, ATEX II 3 G Ex ic IIC T4 Gc, ATEX II 3 G Ex ec IIC T4 Gc; UKEX II 1D 1/2D 2D Ex ta IIIC T139°C Da, UKEX II 3G Ex ic IIC T4 Gc, UKEX II 3G Ex ec IIC T4 Gc; IECEx SIR 09.0149X, IECEx Ex ec IIC T4 Gc, IECEx Ex ic IIC T4 Gc, IECEx Ex ta IIIC T139°C Da, IP68;
<ul style="list-style-type: none"> • US/Canada 	FM/CSA Class II, Div. 1, Groups E, F, G Class III T4 FM/CSA Class I, Div. 2, Groups A, B, C, D, T4
<ul style="list-style-type: none"> • China 	NEPSI Ex nA II T4 Ex nL IIC T4 DIP A20 TA, T139 °C
<ul style="list-style-type: none"> • Brazil 	INMETRO Ex nA IIC T4 Gc, Ex ta IIIC T139°C Da

Programming

Intrinsically Safe Siemens handheld programmer	Infrared receiver
<ul style="list-style-type: none"> • Approvals for handheld programmer 	IS model: ATEX II 1 GD Ex ia op is IIC T4 Ga, ATEX II 1 GD Ex ia op is IIIC T135°C Da, Ta = -20°C to +50°C; UKEX II 1 GD Ex ia op is IIC T4 Ga, UKEX II 1 GD Ex ia op is IIIC T135°C Da, Ta = -20°C to +50°C
Handheld communicator	HART communicator 375/475
PC	SIMATIC PDM, AMS, PACTware
Display (local)	Graphic local user interface including quick start wizard and echo profile displays


¹⁾ From sensor reference point

²⁾ Under severe EMI/EMC environments per IEC61326-1 or NAMUR NE21, the device error may increase to a maximum of 25 mm (1 inch)

³⁾ Universal flange mates with EN 1092-1 (PN16)/ASME B16.5 (150 lb)/JIS 2220 (10K) bolt hole pattern.

Process temperature and pressure

Version	Stainless steel -1 ... 0.5 bar -1 ... 3.0 bar	Aimer flange: -1 ... 0.5 bar	Aimer flange: -1 ... 3.0 bar
40 m	-40 ... +100 °C (-40 ... +212 °F)	-40 ... +100 °C (-40 ... +212 °F)	-40 ... +100 °C (-40 ... +212 °F)
100 m	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +120 °C (-40 ... +248 °F)

Selection and ordering data	Article No.	Order code
SITRANS LR560 Radar level transmitter with flush lens antenna Continuous, non-contact, 100 m (328 ft) range, for general solids applications. Order handheld programmer separately ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5440-  0 0 -	
Measurement and process temperature range 40 m (131 ft) max range, -40 ... +100 °C 100 m (328 ft) max range, -40 ... +200 °C	0 1	
Process connection Universal flat-faced flange fits ANSI/DIN/JIS flanges 80 mm/3 inch, 304 stainless steel 100 mm/4 inch, 304 stainless steel 150 mm/6 inch, 304 stainless steel 80 mm/3 inch, 316L stainless steel 100 mm/4 inch, 316L stainless steel 150 mm/6 inch, 316L stainless steel 80 mm/3 inch, painted aluminum, with integral aimer ¹⁾ 100 mm/4 inch, painted aluminum, with integral aimer ¹⁾ 150 mm/6 inch, painted aluminum, with integral aimer ¹⁾	A B C D E F G H J	
Enclosure (with cable inlet) Stainless steel, 1 x ½" NPT Stainless steel, 1 x M20 x 1.5 (plastic gland included)	A B	
Pressure rating 0.5 bar g (7.5 psi g) maximum 3 bar g (40 psi g) maximum	0 1	
Output/communication 4 ... 20 mA, HART PROFIBUS PA	A B	
Approvals Ordinary Locations/General Purpose (Non-Ex), FM, cCSAus, IC, FCC, CE, UKCA, RED, RCM CSA/FM Class I, Div. 2, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III, Industry Canada, FCC ATEX II 1 D 1/2 D 2 D Ex ta IIIC T139°C Da, ATEX II 3 G Ex ic IIC T4 Gc, ATEX II 3 G Ex ec IIC T4 Gc; UKEX II 1D 1/2D 2D Ex ta IIIC T139°C Da, UKEX II 3G Ex ic IIC T4 Gc, UKEX II 3G Ex ec IIC T4 Gc; INMETRO Ex nA IIC T4 Gc, INMETRO Ex ta IIIC T139°C Da, IP68; IECEX Ex ec IIC T4 Gc, IECEX Ex ic IIC T4 Gc, IECEX Ex ta IIIC T139°C Da, IP68; CE, UKCA, RED, RCM	A B C	
Local display interface Without With	1 2	
		Further designs Please add "-Z" to Article No. and specify Order code(s). Plug M12 with mating connector ¹⁾²⁾³⁾ A50 Plug 7/8" with mating connector ¹⁾³⁾⁴⁾ A55 Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters); specify in plain text Y15 Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 C11 Material inspection Certificate Type 3.1 per EN 10204 ⁵⁾ C12 NAMUR NE43 compliant, device preset to failsafe < 3.6 mA ⁶⁾ N07
		Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation
		Accessories Hand Programmer, Intrinsically safe 7ML1930-1BK Local display interface 7ML1930-1FJ Sun Shield Cover, 304 stainless steel 7ML1930-1FK Housing lid with window 7ML1930-1FL One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART ⁷⁾ 7ML1930-1AP One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA ⁷⁾ 7ML1930-1AQ SITRANS RD100, loop powered display - see Chapter 7 7ML5741-.....- SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7 7ML5742-.....- SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 7ML5740-.....- SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 7ML5744-.....- For applicable back up point level switch - see point level measurement section

¹⁾ Rated to 120 °C max. when used with Pressure rating option 1.

Level Measurement

Continuous level measurement
Radar level transmitters

SITRANS LR560

SITRANS LR560 Specials

SITRANS LR560 Electronics Modules

SITRANS LR560 Electronics Module, HART, 100 m range, compatible with 7ML54401XX00XAXX, no enclosure or process connection included.

7ML1830-3AC

SITRANS LR560 Electronics Module, PROFIBUS PA, 100 m range, compatible with 7ML54401XX00XBXX, no enclosure or process connection included.

7ML1830-3AH

SITRANS LR560 Electronics Module, HART, 40 m range, compatible with 7ML54400XX00XAXX, no enclosure or process connection included.

7ML1830-3AK

SITRANS LR560 Electronics Module, PROFIBUS PA, 40 m range, compatible with 7ML54400XX00XBXX, no enclosure or process connection included.

7ML1830-3AL

SITRANS LR560 Miscellaneous Spare Kits

Kit, lid gasket, EPDM

7ML1830-3AA

Kit, wrench for 4 inch and 6 inch Aimers

7ML1830-3AB

Kit, O-rings for 3 inch Aimer

7ML1830-3AD

Kit, O-rings for 4 inch Aimer

7ML1830-3AE

Kit, O-rings for 6 inch Aimer

7ML1830-3AF

Kit, lid screw and purge plug set with hex keys

7ML1830-3AG

Kit, lid, no Window

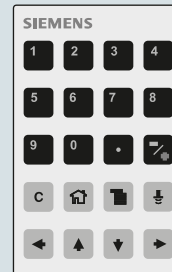
7ML1830-3AP

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Options

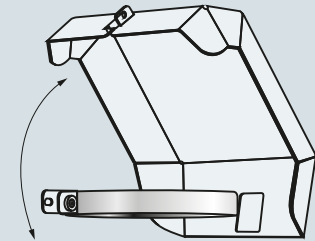
Handheld programmer

Article number:
7ML1930-1BK



Sun shield cover (304 stainless steel)

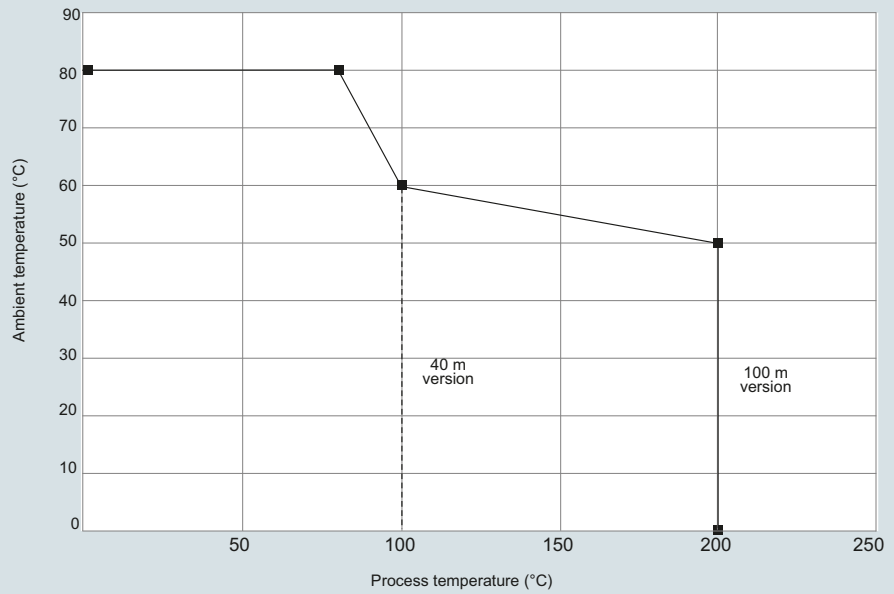
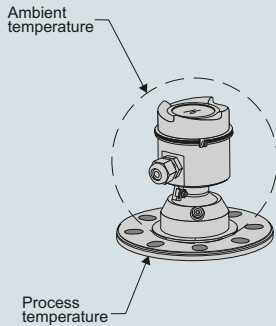
Article number:
7ML1930-1FK



SITRANS LR560 handheld programmer and sun shield cover

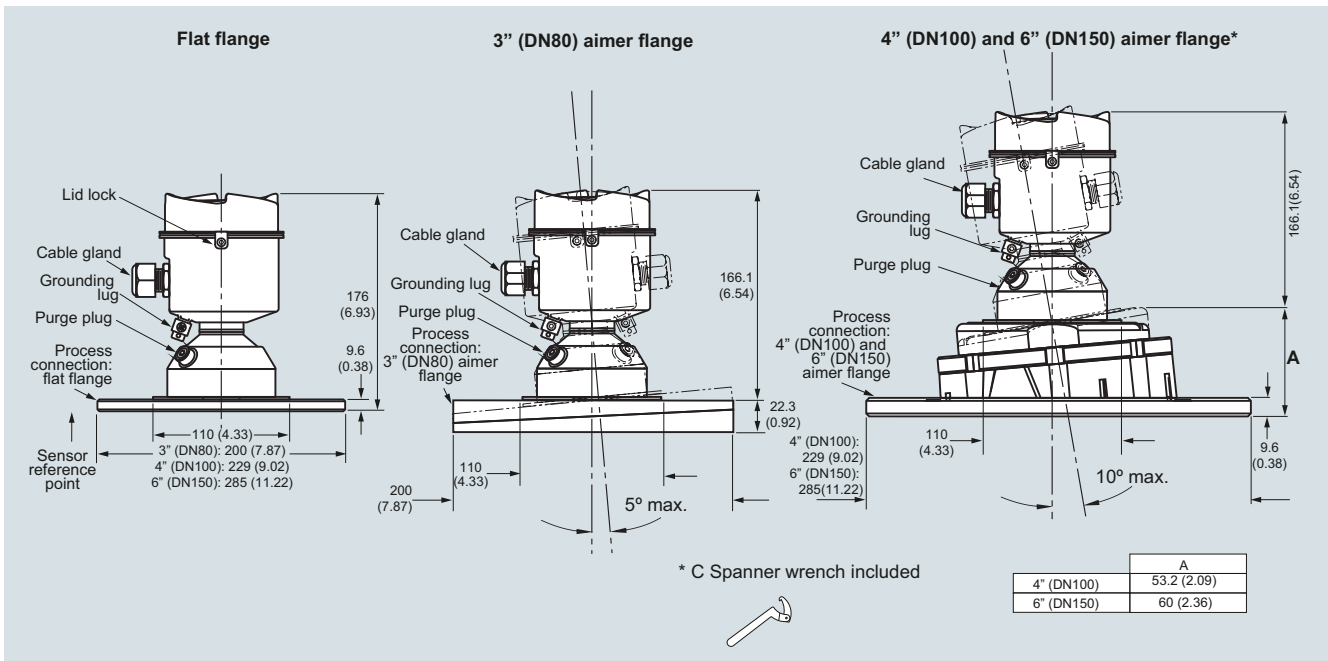
Characteristic curves

Temperature derating curve



SITRANS LR560 temperature derating curve

Dimensional drawings



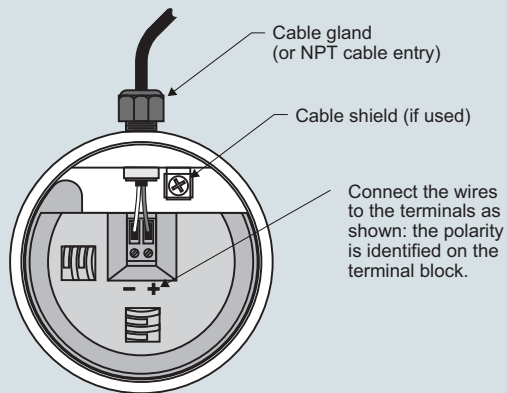
SITRANS LR560, dimensions in mm (inch)

Level Measurement

Continuous level measurement
Radar level transmitters

SITRANS LR560

Circuit diagrams



Notes:

1. Depending on the approval rating, glands and plugs may be supplied with your instrument.
2. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
3. All field wiring must have insulation suitable for rated input voltages.
4. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
5. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR560 connections