

Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR560

Overview



SITRANS LR560 2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids in silos to a range of 100 m (329 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 build up
- 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, 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).

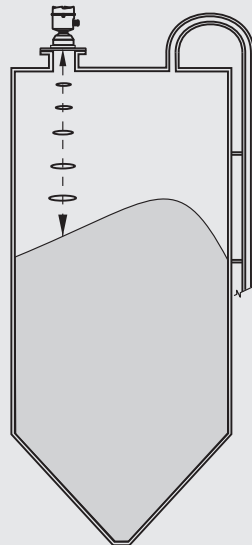
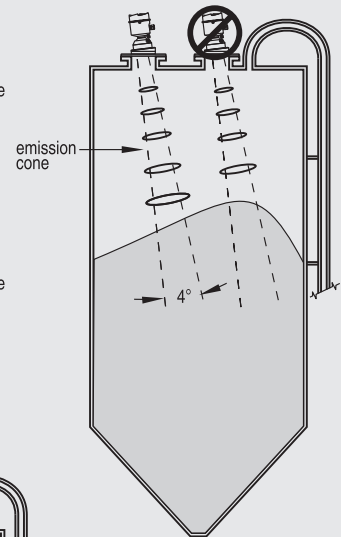
- Key Applications: cement powder, plastic powder/pellets, grain, coal, wood powder, fly ash

Configuration

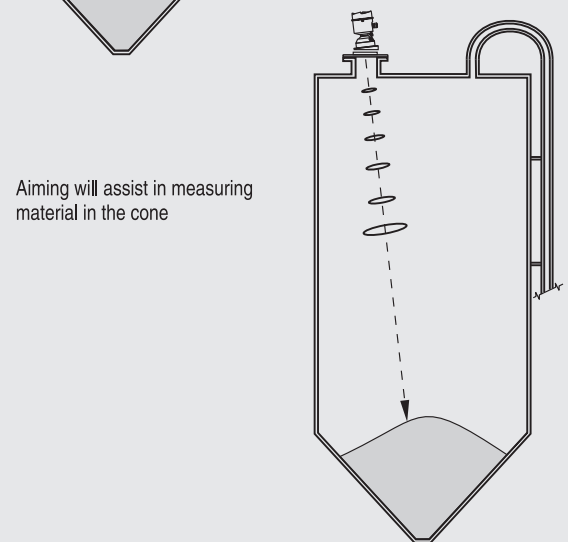
Installation

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



Aiming is rarely required for signal optimization with 78 GHz frequency.



Aiming will assist in measuring material in the cone

SITRANS LR560 installation

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Technical specifications

Mode of operation

Measuring principle	Radar level measurement
Frequency	78 GHz FMCW
Minimum detectable distance	400 mm (15.75") 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

<ul style="list-style-type: none"> • Analog output • Communications 	4 to 20 mA <ul style="list-style-type: none"> • HART • Optional: PROFIBUS PA • Optional: Foundation Fieldbus
<ul style="list-style-type: none"> • 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)

<ul style="list-style-type: none"> • Maximum measured error (including hysteresis and non-repeatability) 	<ul style="list-style-type: none"> • Greater of 25 mm (1") or 0.25 % of range from minimum detectable distance to full range
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Rated operating conditions (according to reference conditions IEC60770-1)

Installation conditions

<ul style="list-style-type: none"> • Location 	Indoor/outdoor
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Ambient conditions (enclosure)

<ul style="list-style-type: none"> • ambient temperature • installation category • pollution degree 	-40 to +80 °C (-40 to +176 °F) I 4
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Medium conditions

<ul style="list-style-type: none"> • Dielectric constant ϵ_r 	>2.0
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Process temperature

<ul style="list-style-type: none"> • 40 m version • 100 m version 	-40 to +100 °C (-40 to +212 °F) -40 to +200 °C (-40 to +392 °F)
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Design

<ul style="list-style-type: none"> • Enclosure <ul style="list-style-type: none"> - Construction - Conduit entry - Lens material • Degree of protection • Weight • Optional local display interface 	316L/1.4404 stainless steel M20x1.5, or ½" NPT via adapter <ul style="list-style-type: none"> • 40 m version: PEI • 100 m version: PEEK Type 4X/NEMA 4X, Type 6/NEMA 6, IP68 with lid closed 3.15 kg (6.94 lb) including 3" flange Graphic LCD, with bar graph representing level
<h5>Process connections</h5> <ul style="list-style-type: none"> • Universal flat-faced flanges²⁾ • Universal flat-faced flanges²⁾ • Aimer flanges²⁾ 	3, 4, 6"/80, 100, 150 mm, 304 stainless steel 3, 4, 6"/80, 100, 150 mm, 316L/1.4404 or 316L/1.4435 stainless steel 3, 4, 6"/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/Foundation Fieldbus	13.5 mA 9 to 32 V DC, per IEC 61158-2

Certificates and approvals

<ul style="list-style-type: none"> • General • Radio 	CSA _{US/C} , CE, FM Europe (R&TTE), FCC, Industry Canada, C-TICK
<ul style="list-style-type: none"> • Hazardous <ul style="list-style-type: none"> - Europe - Europe/International - US/Canada 	ATEX II 3G Ex nA/nL IIC T4 Gc ATEX II 1D, 1/2D, 2D IECEx SIR 09.0149X Ex ta IIIC T139 °C Da 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

Programming

<ul style="list-style-type: none"> • Intrinsically Safe Siemens handheld programmer - Approvals for handheld programmer 	Infrared receiver IS model: ATEX II 1GD Ex ia IIC T4 Ga Ex iaD 20 T135°C Ta = -20 ... +50 °C CSA/FM Class I, II, and III, Div. 1., Gr. A-G, T6 Ta=50C
<ul style="list-style-type: none"> • Handheld communicator • PC • Display (local) 	HART communicator 375/475 SIMATIC PDM, AMS, PACTware Graphic local user interface including quick start wizard and echo profile displays

¹⁾ From sensor reference point

²⁾ Universal flange mates with EN 1092-1 (PN16)/ASME B16.5 (150 lb)/JIS 2220 (10K) bolt hole pattern.

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Accessories

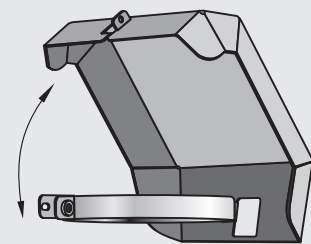
Handheld programmer

Part number:
7ML1930-1BK



Sun Shield Cover

Part number:
7ML1930-1FK



SITRANS LR560 handheld programmer and sun shield cover

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Selection and Ordering data

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2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids in silos to a range of 100 m (329 ft).

Order handheld programmer separately!

Measurement and process temperature range

40 m (131 ft) max range, -40 to +100 °C
100 m (329 ft) max range, -40 to +200 °C

Process connection

Universal flat-faced flange fits ANSI/DIN/JIS flanges

3" / 80 mm, 304 stainless steel
4" / 100 mm, 304 stainless steel
6" / 150 mm, 304 stainless steel

3" / 80 mm, 316L stainless steel
4" / 100 mm, 316L stainless steel
6" / 150 mm, 316L stainless steel

3" / 80 mm, painted aluminum, with integral aimer¹⁾
4" / 100 mm, painted aluminum, with integral aimer¹⁾
6" / 150 mm, painted aluminum, with integral aimer¹⁾

Enclosure (with cable inlet)

Stainless Steel, 1 X 1/2" NPT
Stainless Steel, 1 X M20 x 1.5 (plastic gland included)

Pressure rating

0.5 bar g (7.5 psi g) maximum
3 bar g (40 psi g) maximum

Output/communication

4 to 20 mA, HART®
PROFIBUS PA
Foundation Fieldbus

Approvals

General Purpose, CSA_{US/CA}, Industry Canada, FCC, CE, R&TTE, C-TICK
CSA/FM Class I, Div. 2, Gr. A,B,C,D, Class II, Div. 1, Gr. E,F,G, Class III
ATEX II 1 D, 1/2 D, 2 D, 3G Ex nA/nL, CE, R&TTE, C-TICK

Local display interface

Without LDI (local display interface) 1
With LDI (local display interface) 2

Further designs

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

Plug M12 with mating Connector²⁾
Plug 7/8" with mating Connector²⁾

Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000

Inspection Certificate Type 3.1 per EN 10204³⁾
NAMUR NE43 compliant, device preset to failsafe <3.6 mA⁴⁾

Stainless steel tag [69 x 50 mm (2.71 x 1.97")]:
Measuring-point number/identification (max. 27 characters) specify in plain text

Instruction manual for HART device

English

German

Note: The instruction manual should be ordered as a separate line item on the order.

Multi-language Quick Start manual

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Order No.

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Selection and Ordering data

SITRANS LR560

2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids in silos to a range of 100 m (329 ft).

Order handheld programmer separately!

Instruction manual for PROFIBUS PA device

English

German

Note: The instruction manual should be ordered as a separate line item on the order.

Multi-language Quick Start manual

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Instruction manual for Foundation Fieldbus device

English

German

Note: The instruction manual should be ordered as a separate line item on the order.

Multi-language Quick Start manual

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Accessories

Hand Programmer, Intrinsically safe

Local display interface

Sun Shield Cover

Housing lid with window

One metallic cable gland M20 x 1.5, rated -40 to +80 °C (-40 to +176 °F), HART

One metallic cable gland M20 x 1.5, rated -40 to +80 °C (-40 to +176 °F), PROFIBUS PA

SITRANS RD100 Remote display - see Chapter 8

SITRANS RD200 Remote display - see Chapter 8

SITRANS RD500 Remote display - see Chapter 8

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

²⁾ Available with Approval option A only

³⁾ Available with Pressure rating option 1 only

⁴⁾ Available with Output/communication option A only

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C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

Note 1: available with no pressure rating, 0.5 bar g maximum. Please contact nacc.smpi@siemens.com for special requests.

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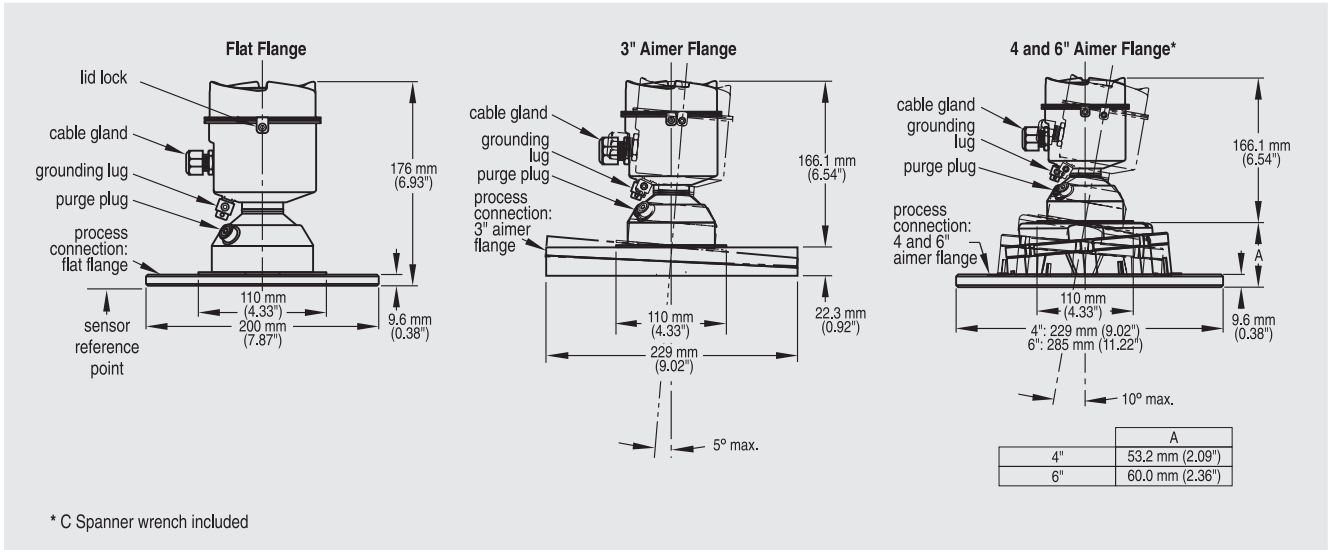
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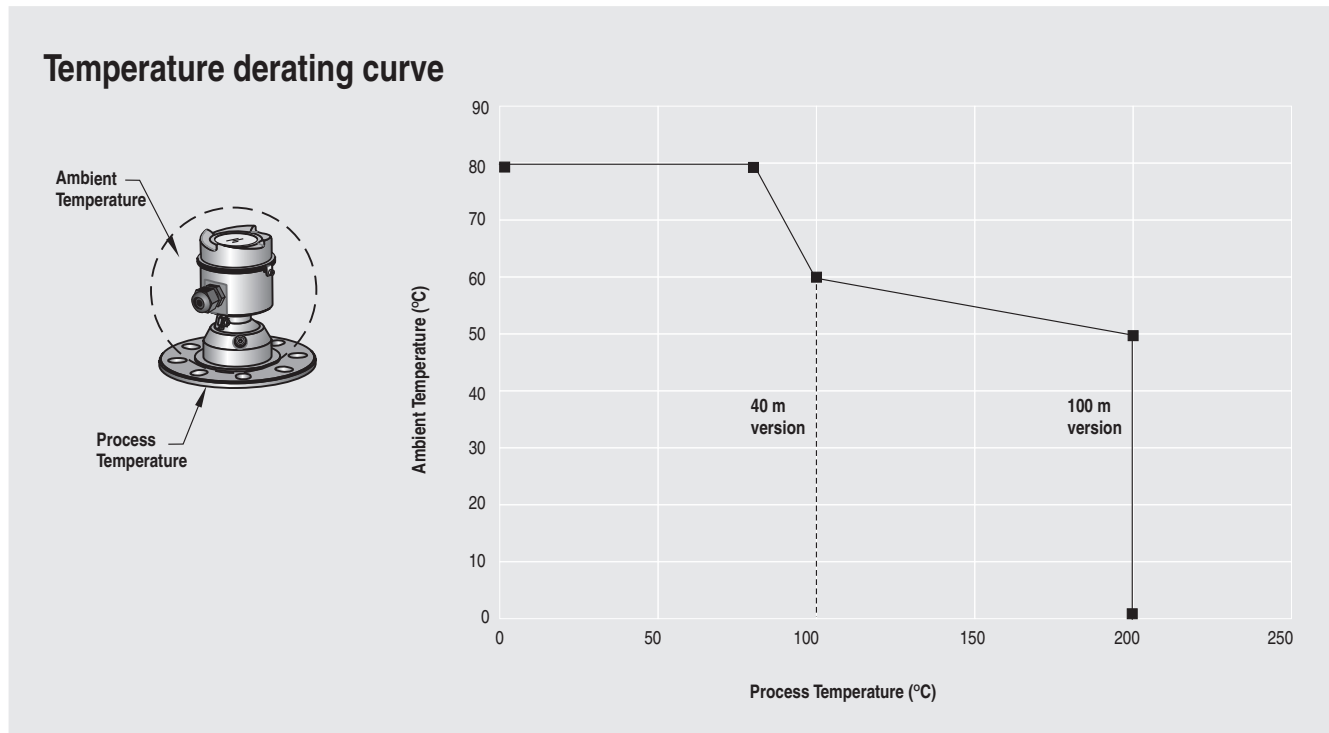
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Dimensional drawings



SITRANS LR560 dimensions

Characteristic curves



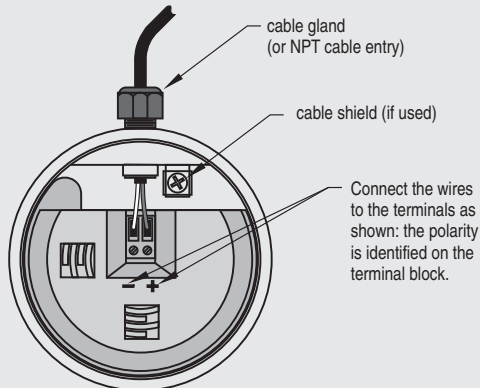
SITRANS LR560 temperature derating curve

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Schematics



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 to 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