

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR260

Overview



SITRANS LR260 is a 2-wire 25 GHz pulse radar level transmitter for continuous monitoring of solids and liquids in storage vessels including extreme levels of dust and high temperatures, to a range of 30 m (98.4 ft).

Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency allows for small horn antennas mounted easily in nozzles
- Communication using HART or PROFIBUS PA
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or SIMATIC PDM

Application

SITRANS LR260 includes a graphical local user interface (LUI) that improves setup and operation using an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

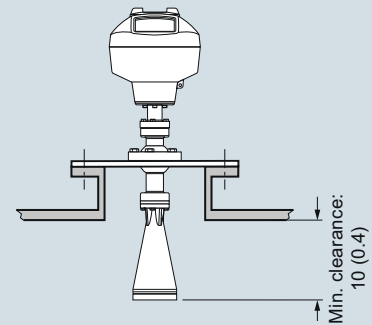
SITRANS LR260's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR260 measures virtually any solids material to a range of 30 m (98.4 ft).

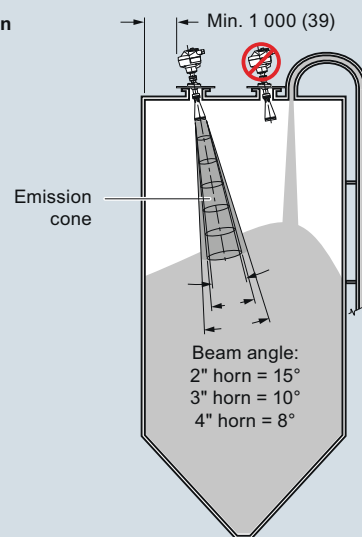
- Key Applications: cement powder, plastic powder/pellets, grain, flour, coal, solids and liquids bulk storage vessels, and other applications

Configuration

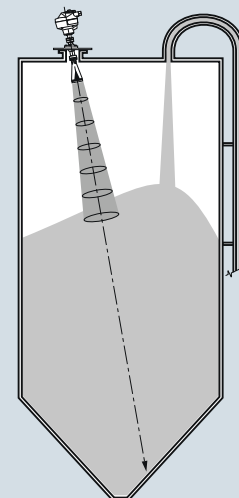
Mounting on a nozzle



Installation



Positioning with easy Aimer



SITRANS LR260 installation, dimensions in mm (inch)

Technical specifications

Mode of operation

Measuring principle	Pulse radar level measurement
Frequency	K-band (25.0 GHz)
Minimum detectable distance	0.05 m (2 inch) from end of horn
Maximum measuring range ¹⁾	
Solids	<ul style="list-style-type: none"> • 2" horn: 10 m (32.8 ft) • 3" horn: 20 m (65.6 ft) • 4" horn: 30 m (98.4 ft)
Liquids	<ul style="list-style-type: none"> • 2" horn: 20 m (65.6 ft) • 3" horn: 30 m (98.4 ft) • 4" horn: 30 m (98.4 ft)

Output - HART

Power	4 ... 20 mA (± 0.02 mA accuracy)
Fail signal	Nominal 24 V DC (max. 30 V DC)
Load	3.6 mA ... 23 mA; or last value 230 ... 600 Ω

Output - PROFIBUS PA

- Per IEC 61158-2
- 15.0 mA
- Profile version 3.01, Class B

Performance (according to reference conditions IEC60770-1)

Maximum measured error (including hysteresis and non-repeatability)	<ul style="list-style-type: none"> • 25 mm (1 inch) from minimum detectable distance to 300 mm (11.8 inch) • Remainder of range = 6 mm (0.23 inch) or 0.05 % of spa (whichever is greater)
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Rated operating conditions

Installation conditions	
Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4

Medium conditions

Dielectric constant ϵ_r	$\epsilon_r > 1.6$, antenna and application dependent
Process temperature	-40 ... +200 °C (-40 ... +392 °F)
Process pressure	<ul style="list-style-type: none"> • 0.5 bar g (7.25 psi g) maximum • 3 bar g (43.5 psi g) optional with 80 °C (176 °F) temperature max

Design

Enclosure	
• Construction	Aluminum, polyester powder-coated
• Conduit entry	2 x M20 x 1.5 or 2 x 1/2" NPT
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
Weight	< 8.14 kg (17.9 lb) including 4" flange and standard Easy Aimer with 4" horn antenna
Display (local)	Graphic LCD, with bar graph representing level
Flange and horn (easy aimer model)	
• Material	304 stainless steel
• Horn antenna	2" horn 3" horn 4" horn
Process connections	
• Universal flanges ²⁾	2 inch/50 mm, 3 inch/80 mm, 4 inch/100 mm, 6 inch/150 mm
Mechanical (Threaded Connection model)	
• Threaded connection	2" NPT (ASME B1.20.1), R (BSPT, EN 10226-1), or G (BSPP, EN ISO 228-1)
• Materials	316L/1.4404 or 316L/1.4435 stainless steel PTFE emitter

Certificates and approvals

General	CSA _{US/C} , CE, FM
Radio	Europe (R&TTE), FCC, Industry Canada, RCM
Hazardous	CSA/FM Class II, Div. 1, Groups E, F, G, Class III ATEX II 1D, 1/2D, 2D Ex ta IIIC T100 °C Da IECEX/ATEX II 1 GD Ex ia IIC T4 Ga, Ex ta IIIC T100 °C Da CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G SABS ARP0108 Ex ia IIC T4 Ga

Programming

Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld programmer	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, Groups A, B, C, D, E, F, G, T6 Ta = 50 °C
Handheld communicator	HART communicator 375
PC	SIMATIC PDM
Display (local)	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 (PN 16)/ASME B16.5 (150 lb)/JIS 2220 (10K) bolt hole pattern

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Selection and Ordering data

SITRANS LR260

2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of solids to a range of 30 m (98.4 ft).

Order handheld programmer separately

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Process connection

Universal flat faced flange fits ANSI/DIN/JIS flanges, Easy Aimer with integral (Easy Aimer ball)

- 2 inch/50 mm
- 3 inch/80 mm
- 4 inch/100 mm
- 6 inch/150 mm

Threaded connection

- 2" NPT (ASME B1.20.1) (tapered thread)¹⁾²⁾⁵⁾
- R 2" [(BSPT), EN 10226-1] (tapered thread)¹⁾²⁾⁵⁾
- G 2" [(BSPT), EN ISO 228-1] (parallel thread)¹⁾²⁾⁵⁾

For custom process connections, contact a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Antenna

- 2" Horn antenna, fits 50 mm or 2" nozzles¹⁾
- 2" Horn antenna with 100 mm extension¹⁾
- 2" Horn antenna with 200 mm extension¹⁾
- 2" Horn antenna with 500 mm extension¹⁾²⁾
- 2" Horn antenna with 1 000 mm extension¹⁾²⁾
- 3" Horn antenna, fits 80 mm or 3" nozzles³⁾
- 3" Horn antenna with 100 mm extension³⁾
- 3" Horn antenna with 200 mm extension³⁾
- 3" Horn antenna with 500 mm extension²⁾³⁾
- 3" Horn antenna with 1 000 mm extension²⁾³⁾
- 4" Horn antenna, fits 100 mm or 4" nozzles
- 4" Horn antenna with 100 mm extension
- 4" Horn antenna with 200 mm extension
- 4" Horn antenna with 500 mm extension²⁾
- 4" Horn antenna with 1 000 mm extension²⁾

For custom antennas, contact a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Purge (self cleaning) connection

- No purge connection
- Purge connection

Output/communication

- 4 ... 20 mA, HART
- PROFIBUS PA

Cable inlet

- 2 x M20 x 1.5
- 2 x 1/2" NPT

Note: Polymer cable glands will be provided with M20 devices.

Approvals

General purpose, CSA_{US/C}, FM, Industry Canada, FCC, CE, R&TTE, RCM

CSA/FM Class II, Div. 1, Groups E, F, G, Class III, Industry Canada, FCC, RCM

ATEX II 1D, 1/2D, 2D Ex ta IIIC T100 °C Da, CE, R&TTE, RCM, INMETRO

Non-incendive, CSA/FM Class I, Div. 2, Groups A, B, C, D, Industry Canada, FCC, RCM

Intrinsically safe, IECEx/ATEX II 1 GD Ex ia IIC T4 Ga, Ex ta IIIC T100 °C Da, R&TTE, RCM

Intrinsically safe, CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada, FCC, RCM

Intrinsically safe, South Africa ARP0108 Ex ia IIC T4 Ga

Pressure rating

Rating per Pressure/Temperature curves in manual⁶⁾

0.5 bar g (7.25 psi g) maximum

Article No.

7ML5427-

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1

Selection and Ordering data

Further designs

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

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

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

Material inspection Certificate Type 3.1 per EN 10204⁴⁾

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

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

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

Handheld programmer, Infrared, Intrinsically Safe

Dust cap, PTFE, for 2 inch/50 mm horn

Dust cap, PTFE, for 3 inch/75 mm horn

Dust cap, PTFE, for 4 inch/100 mm horn

HART modem/USB (for use with a PC and SIMATIC PDM)

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

For applicable back up point level switch - see point level measurement section

Note: Products shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

¹⁾ Maximum measurement range 10 m (32.8 ft) solids or 20 m (65.6 ft) liquids

²⁾ Available with Purge option 0 only

³⁾ Maximum measurement range 20 m (65.6 ft) solids or 30 m (98.4 ft) liquids

⁴⁾ Available with pressure option 0 only

⁵⁾ Available with Antenna options A, B, F, G, L, and M only

⁶⁾ Available with pressure option 0 only

Order code

Y15

C11

C12

Article No.

7ML1930-1AP

7ML1930-1AQ

7ML1930-1BK

7ML1930-1DE

7ML1930-1BL

7ML1930-1BM

7MF4997-1DB

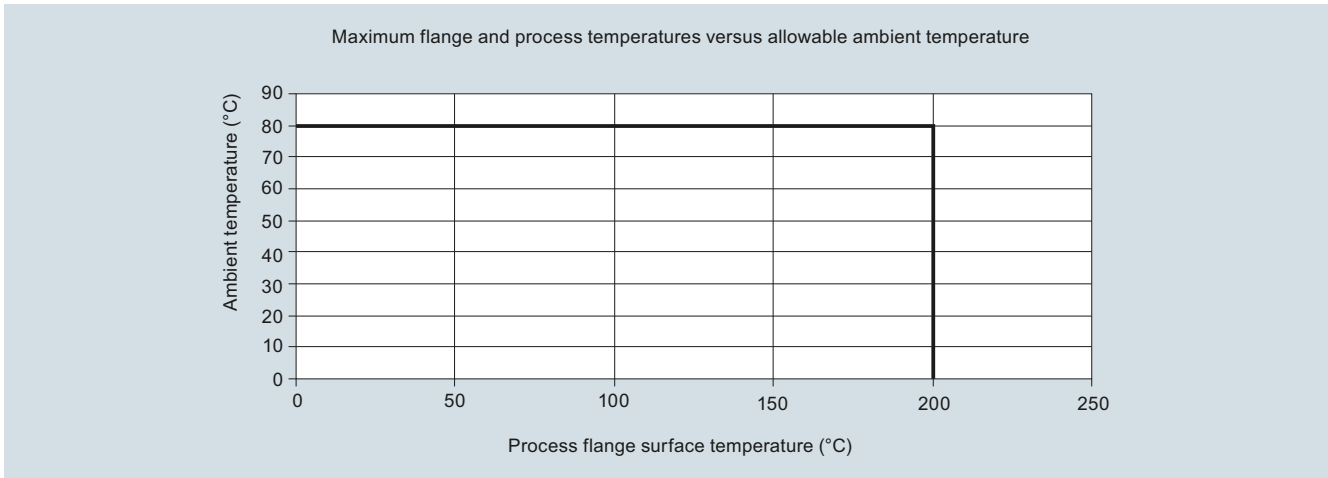
7ML5741-...

7ML5740-...

7ML5744-...

7ML5750-...

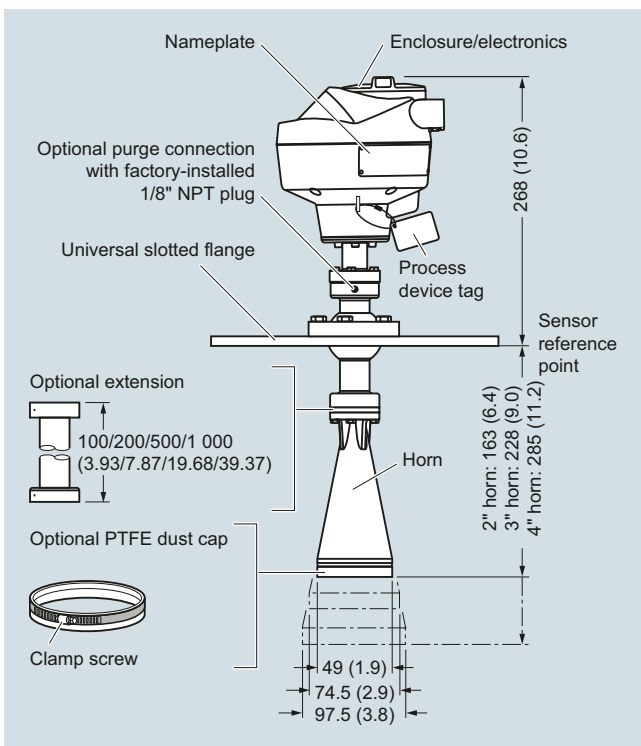
Characteristic curves



SITRANS LR260 ambient/process flange surface temperature curve

4

Dimensional drawings



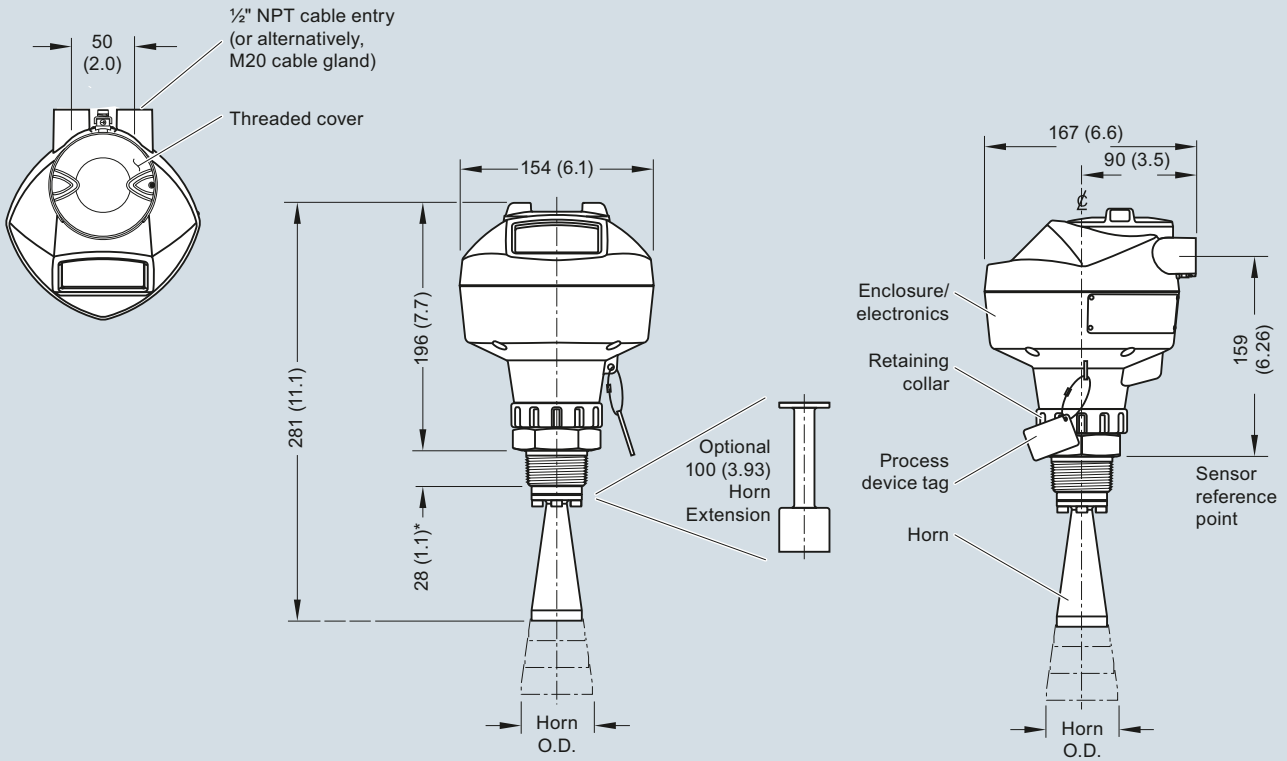
SITRANS LR260, dimensions in mm (inch)

Level Measurement

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SITRANS LR260

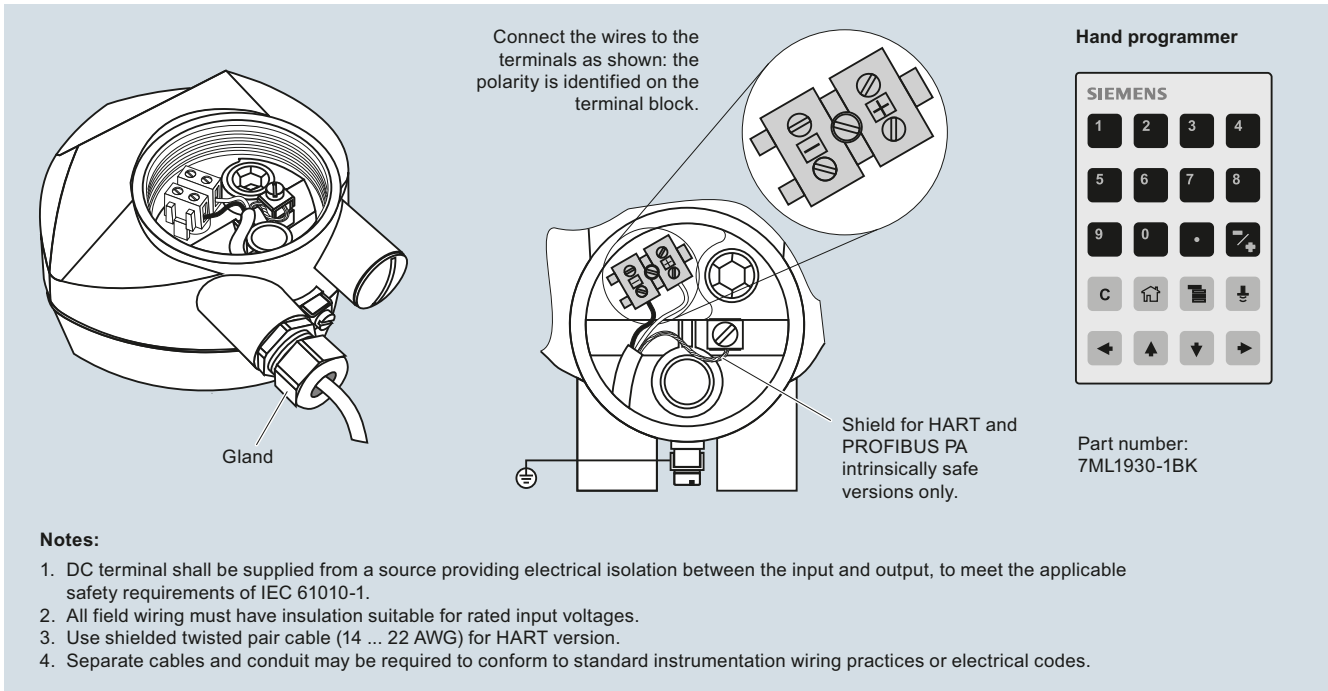
SITRANS LR260



Antenna Type	Antenna O.D.	Height to sensor reference point			Beam angle	Measurement range
		1-1/2" threaded connection	2" threaded connection	3" threaded connection		
2" horn	47.8 (1.88)	N/A	166 (6.55)	180 (7.09)	15 degrees	20 m (65.6 ft)
3" horn	74.8 (2.94)	N/A	199 (7.85)	213 (8.39)	10 degrees	30 m (98.4 ft)
4" horn	94.8 (3.73)	N/A	254 (10)	268 (10.55)	8 degrees	30 m (98.4 ft)

SITRANS LR260, dimensions in mm (inch)

Schematics



Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

Gland

Shield for HART and PROFIBUS PA intrinsically safe versions only.

Hand programmer

SIEMENS			
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5	6	7	8
9	0	.	↵
C	⏠	⏏	⏴
←	↑	↓	→


Part number:
7ML1930-1BK

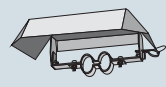
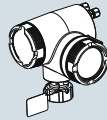
Notes:

1. 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.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR260 connections

Selection and ordering data

SITRANS LR260/LR460 Specials	Article No.
NOTE: LR260 head can be supplied with any LR250 process connection or antenna as special order. For LR250, this means a stronger signal and longer measurement range is possible.	
Process connection part kits - non-pressure-rated	
SITRANS LR260/LR460, 100 mm extension for horn antenna, no purge ¹⁾	A5E01087872
SITRANS LR260/LR460, 200 mm extension for horn antenna, no purge ¹⁾	A5E01091262
SITRANS LR260/LR460, 100 mm extension for horn antenna with purge ¹⁾	A5E01261979
SITRANS LR260/LR460, 200 mm extension for horn antenna with purge ¹⁾	A5E01261981
SITRANS LR260/LR460, horn 2", no purge, no emitter ¹⁾	A5E02083905
SITRANS LR260/LR460, horn 3", no purge, no emitter ¹⁾	A5E01623511
SITRANS LR260/LR460, horn 4", no purge, no emitter ¹⁾	A5E01623512
SITRANS LR260/LR460, horn 2", with purge, no emitter ¹⁾	A5E02083906
SITRANS LR260/LR460, horn 3", with purge, no emitter ¹⁾	A5E01623513
SITRANS LR260/LR460, horn 4", with purge, no emitter ¹⁾	A5E01623514
SITRANS LR260/LR460, 3" universal flat faced flange ¹⁾	A5E02303897
SITRANS LR260/LR460, 4" universal flat faced flange ¹⁾	A5E01259467
SITRANS LR260/LR460, 6" universal flat faced flange ¹⁾	A5E01261834
SITRANS LR260/LR460 O-rings for Easy Aimer ¹⁾	A5E01261836
Kit, Emitter for LR260/LR460 ¹⁾	A5E02360694
SITRANS LR260 lid with O-ring	A5E02465410
Purge conversion kit – non-pressure-rated (no flange or extension included)	
SITRANS LR260/LR460 purge conversion, 2" horn ¹⁾	A5E02083914
SITRANS LR260/LR460 purge conversion, 3" horn ¹⁾	A5E02083915
SITRANS LR260/LR460 purge conversion, 4" horn ¹⁾	A5E02083916
Enclosure with electronics (LR260)	
	
SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option A, no process connection	A5E02203605
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option A, no process connection	A5E02213423
SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option A, no process connection	A5E02165924

SITRANS LR260/LR460 Specials	Article No.
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, NPT cable inlet, approval option A, no process connection	A5E02213428
SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option D, no process connection	A5E03934184
SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option E, no process connection	A5E03934187
SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option F, no process connection	A5E03934191
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option E, no process connection	A5E37217558
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option F, no process connection	A5E31820689
Sun shield for SITRANS LR260 enclosure, stainless steel	
	A5E39142556
Enclosure with electronics (LR460)	
SITRANS LR460 enclosure with board stack, HART communication, AC power, M20 cable inlet, approval option A, no process connection	A5E02182085
SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, AC power, M20 cable inlet, approval option A, no process connection	A5E02212422
SITRANS LR460 enclosure with board stack, HART communication, AC power, NPT cable inlet, approval option A, no process connection	A5E02212423
SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, AC power, NPT cable inlet, approval option A, no process connection	A5E02212424
SITRANS LR460 enclosure with board stack, HART communication, DC power, M20 cable inlet, approval option A, no process connection	A5E02212425
SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, DC power, M20 cable inlet, approval option A, no process connection	A5E02212426
SITRANS LR460 enclosure with board stack, HART communication, DC power, NPT cable inlet, approval option A, no process connection	A5E02212428
SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, DC power, NPT cable inlet, approval option A, no process connection	A5E02212429

¹⁾ Available with no pressure rating, 0.5 bar g maximum. 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.