

## Overview



SITRANS LR120 is a compact radar transmitter for continuous level measurement of liquids and solids to a range of 30 m (98.4 ft).

## Benefits

- Bluetooth connectivity for easy setup with SITRANS mobile IQ.
- Chemically resistant PVDF enclosure.
- HART 7.0 or Modbus RTU communication for intelligent integration into your application.
- W band FMCW radar yields narrow beam with small antenna for superior performance in applications with obstructions.
- Approved for open air applications outside of a tank.
- 2 mm accuracy and zero near range distance yields optimum inventory management capability.
- Submergence shield accessory prevents build up on sensor during flooding conditions.
- Hazardous area variants available for safe use in explosive gas or dust environments.

## Application

SITRANS LR120 is a W band FMCW radar level transmitter, packaged in a hermetically sealed PVDF enclosure for years of trouble-free reliable measurement service.

4 to 20 mA loop powered with HART [optional 4-wire Modbus RTU], providing accurate level measurement to ranges of 30 m (98.4 ft). Its long range, narrow beam make LR120 suitable for wet wells with obstructions or solids level measurement, for example aggregates or plastic pellets. Programming is convenient using the Bluetooth connection and SITRANS mobile IQ application on your smart device.

## SITRANS LR120

## Selection and ordering data

		Article No.											
<b>SITRANS LR120 Radar level transmitter</b> Continuous, non-contact, 30 m (98.4 ft) range, for liquids, slurries, and solids, integrated cable connection		7	M	L	5	3	2	1	0	6	0	0	0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
<b>Communications</b>													
HART (4 ... 20 mA)		0											
Modbus RTU <sup>(4)(6)</sup>		3											
<b>Bluetooth function</b>													
Without		0											
With		1											
<b>Cable length</b>													
5 m													
10 m		A											
30 m		B											
50 m		C											
100 m		D											
<b>Type of protection</b>													
Ordinary Locations/General Purpose (Non-Ex), cFM <sub>US</sub> , cCSA <sub>US</sub> , CE, UKCA, RCM <sup>2)</sup>													
ATEX II 1G, 1/2G Ex ia IIC T4 Ga, Ga/Gb, ATEX II 1D, 1/2D Ex ia IIC T134 °C Da, Da/Db; UKEX II 1G, 1/2G Ex ia IIC T4 Ga, Ga/Gb, UKEX II 1D, 1/2D Ex ia IIC T134 °C Da, Da/Db; Gas Ex-Zone 0/Class 1, Div. 1; Dust Ex-Zone 20, 21, Class II & III Div. 1 <sup>1)</sup>													
ATEX II 2G Ex ib mb IIC T4 Gb; UKEX II 2G Ex ib mb IIC T4 Gb; ATEX II 1D, 1/2D Ex ta, ta/tb IIC T200 121 °C Da, Da/Db, ATEX II 2D Ex tb IIC T200 134 °C Db; UKEX II 1D, 1/2D Ex ta, ta/tb IIC T200 121 °C Da, Da/Db, UKEX II 2D Ex tb IIC T200 134 °C Db; ATEX II 1D, 1/2D Ex ta, ta/tb IIC T200 142 °C Da, Da/Db, ATEX II 2D Ex tb IIC T200 155 °C Db; UKEX II 1D, 1/2D Ex ta, ta/tb IIC T200 142 °C Da, Da/Db, UKEX II 2D Ex tb IIC T200 155 °C Db; Zone 1, 1/2, Zone 20, 21, 22, (Class I, Div. 2), Class II & III, Div. 1 <sup>1)(3)</sup>		A B  G											
<b>Electrical connection of the cable entry</b>													
1" BSPT													
1" NPT		H P											

Selection and ordering data	Order Code
<b>Further designs</b>	
Please add "-Z" to Article No. and specify Order code(s).	
Tag (device parameter, max. 32 characters) plate stainless steel 304/1.4301	Y15
Inspection certificate 3.1 (EN 10204) - device with test data	C25
cFM <sub>US</sub> , cCSA <sub>US</sub> , ATEX, UKEX, IECEx	E49
INMETRO, IA MASC	E25
NEPSI, CCOE	E27
ATEX, UKEX, IECEx	E47
CSA-Japan-Ex	E29
EACEx <sup>5)</sup>	E24
WHG and VLAREM II	E61
NSF 61 Drinking Water and FDA, EG1935/2004	E84

Accessories	Article No.
<b>Operating Instructions</b>	
All literature is available to download for free, in a range of languages, <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a>	
<b>Accessories</b>	
Submergence shield kit	A5E49069764
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	7ML1830-1AQ
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	7ML1830-1AX
Easy Aimer 304, NPT with 1" stainless steel coupling	7ML1830-1AU
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	7ML1830-1GN
Bracket, 316L Stainless steel, 1 inch mount, 80 mm (3.1 inch) offset	A5E50507509
Bracket, 316L Stainless steel, 1 inch mount, 200 mm (7.9 inch) offset	A5E50507511
Bracket, 316L Stainless steel, 1.5 inch mount, 80 mm (3.1 inch) offset	A5E50507514
Bracket, 316L Stainless steel, 1.5 inch mount, 200 mm (7.9 inch) offset	A5E50507516
FMS-200 universal box bracket, mounting kit	7ML1830-1BK
FMS-210 channel bracket, wall mount	7ML1830-1BL

## Selection and ordering data (continued)

Accessories	Article No.
FMS-220 extended channel bracket, wall mount	7ML1830-1BM
FMS-310 channel bracket, floor mount	7ML1830-1BN
FMS-320 extended channel bracket, floor mount	7ML1830-1BP
FMS-350 bridge channel bracket, floor mount (see Mounting Brackets catalog page for more information)	7ML1830-1BQ
1" NPT locknut, plastic	7ML1830-1DS
1" BSP locknut, plastic	7ML1830-1DR
Plastic adapter 1" BSP - 20 mm	7ML1830-1EA
Plastic adapter 1" NPT	7ML1930-1FX
Plastic adapter 1" NPT/M20	7ML1830-1EF
<b>Note: Polypropylene adapter flanges available via PVR request.</b>	
SIMATIC RTU3010C compact, remote data manager with alarming	6NH3112-0BA00-0-XX0
SIMATIC RTU3030C compact, remote data manager with alarming	6NH3112-3BA00-0-XX0
Intrinsically Safe barrier	7NG4124-1AA00
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-.....-
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices - see Chapter 7	7ML5742-.....-....

Accessories	Article No.
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-.....-
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 section	

- 1) Must be ordered in combination with order codes E49, E25, E27, E47 E29, or E24.
- 2) Not available in combination with order codes E49, E25, E27, E47, E29, or E24
- 3) When ordered in combination with NPT thread types, this option is available with any order code. When ordered in combination with BSPP or BSPT thread types, this option is only available with order codes E49, E25, E27 or E47, E29
- 4) Available only with Type of protection options A and G.
- 5) Available only with Type of protection option B.
- 6) Available only with Bluetooth option 1.

## SITRANS LR120

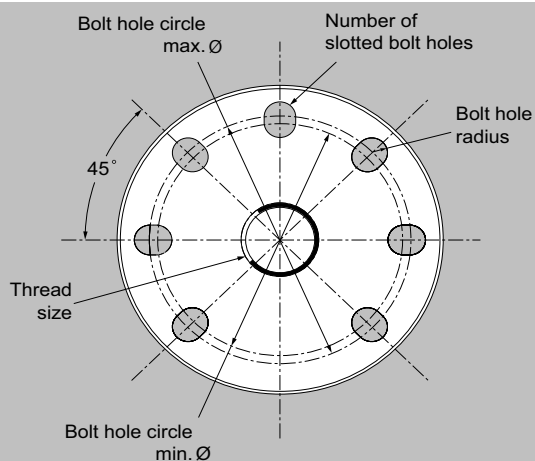
## Technical specifications

SITRANS LR120	
<b>Mode of operation</b>	
Measuring principle	W band FMCW radar
Measuring range	0 ... 30 m (0 ... 98.4 ft)
Frequency	80 GHz nominal
Beam angle	4°
<b>Power Supply</b>	
HART	
• Voltage	12 ... 35 V DC
• Current	4 ... 20 mA
Modbus	
• Voltage	8 ... 30 V DC
• Current	38 mA at 8 V DC/17 mA at 30 V DC
<b>Communications</b>	
4 ... 20 mA	HART 7.0
Modbus (4-wire option)	RTU
<b>Accuracy</b>	
	± 2 mm (range 0.25 ... 30 m), ± 10 mm (range 0 ... 0.25 m)
<b>Rated operating conditions</b>	
Vessel pressure	-1 ... +3 bar (14.50 ... 43.51 psi g)
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
Process temperature	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Minimum dielectric of the medium	1.6
<b>Design</b>	
Weight	0.7 kg (1.5 lb), plus 0.1 kg/m (0.2 lb/ft) cable length
Material	
• Enclosure	PVDF
• Submergence shield	<ul style="list-style-type: none"> <li>• Polypropylene</li> <li>• Silicone O-ring</li> </ul>
Degree of protection	IP66/IP68
Cable connection	
• HART	1" NPT or 1" BSPT threaded connection Length options: 5 ... 100 m (16.4 ... 328.1 ft), 2 conductor, twisted with shield 18 AWG, PVC jacket
• Modbus version	Length options: 5 ... 100 m (16.4 ... 328.1 ft), 4 conductor, twisted pairs, 22 AWG, polyurethane jacket
<b>Certificates and approvals</b>	
	CE, cFM <sub>US</sub> , cCSA <sub>US</sub> , ATEX, UKCA, IECEX, EACEX, CSA-Japan-Ex, RCM, INMETRO, NEPSI, CCOE, PESO, FDA, Reg. (EC) No. 1935/2004
Radio	CE, UKCA, FCC, IC, Anatel, ICASA, NCC, KC, CITC, RCM, WPC, Telec, NBTC, MCMC
Marine	ABS, CCS, DNV-GL, LR, NK, RINA
Canadian Registration Number (CRN)	
• British Columbia	0F22218.51
• Alberta	0F20596.2
• Saskatchewan	0F2002.3
• Manitoba	0F7032.4
• Ontario	0F22218.5
• Quebec	0F05183.6
• New Brunswick	0F1490.07
• Nova Scotia	0F1490.08
• Prince Edward Island	0F1490.09
• Newfoundland and Labrador	0F1490.0

## Technical specifications (continued)

SITRANS LR120	
• Yukon	0F1490.0Y
• Northwest Territories	0F1490.0T
• Nunavut	0F1490.0N
<b>Programming</b>	
SITRANS mobile IQ app	SITRANS mobile IQ is a Bluetooth app that provides an intuitive interface to quickly configure, set up and monitor SITRANS LR100 series. For more information: <a href="http://www.siemens.com/mobileIQ">http://www.siemens.com/mobileIQ</a>
SIMATIC PDM	SIMATIC PDM allows for remote PC configuration and diagnostics (for installation on a network).
SITRANS DTM	

## Options

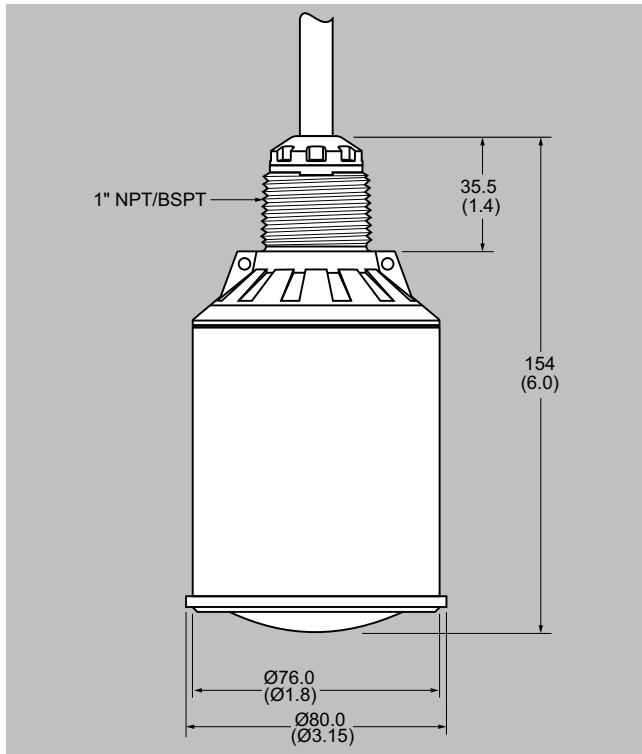


Part number	Adapter flange size	OD $\pm 1$	B.C.D. max. for slotted holes (bmax.) $\pm 0.75$	B.C.D. min. for slotted holes (bmin.) $\pm 0.75$	Bolt hole radius $\pm 0.25$	Number of slotted holes	Thread size
A5E50868953 A5E50868975 A5E50869003 A5E50869005 A5E50869010	4"/DN100	229	191	175	R 9.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868976 A5E50868977 A5E50869012 A5E50869014 A5E50869015	6"/DN150	285	242	240	R 11.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP

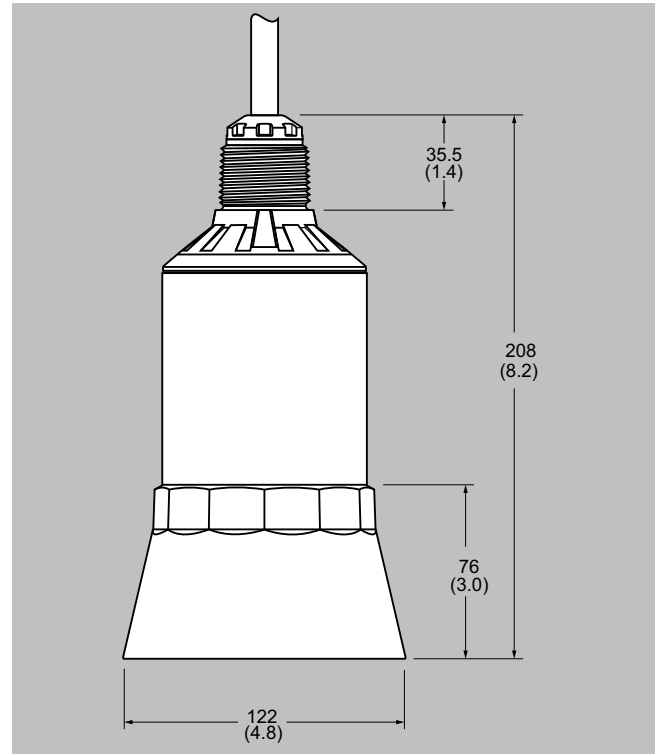
SITRANS LR120 Polypropylene adapter flange

## SITRANS LR120

## Dimensional drawings

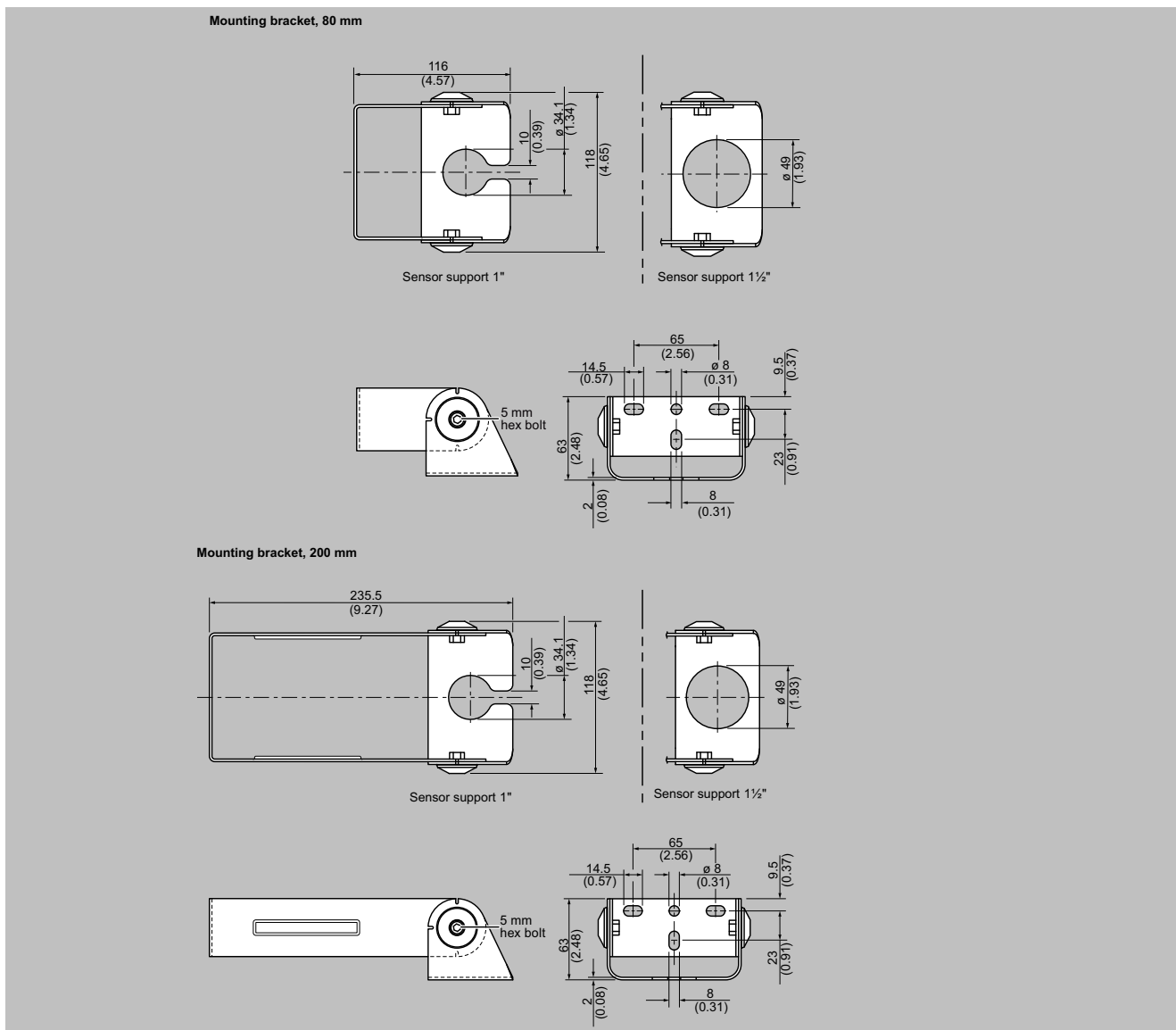


SITRANS LR120, dimensions in mm (inch)



SITRANS LR120 Submergence shield accessory, dimensions in mm (inch)

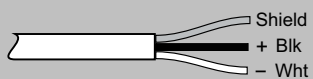
## Dimensional drawings (continued)



SITRANS LR120 mounting brackets, dimensions in mm (inch)

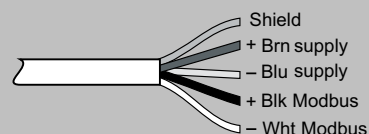
## Circuit diagrams

## HART



12 ... 35 V DC  
4 ... 20 mA  
Loop powered

## Modbus



8 ... 30 V DC  
30 mA at 8 V DC/  
17 mA at 30 V DC  
Modbus RTU

SITRANS LR120 connections