

Level product portfolio

Free-space radar, guided wave radar and buoyancy/displacer



LG01 Guided Wave



LR01 10 GHz



LR54 24 GHz



LR64 24 GHz



LR74 24 GHz



LR65 80 GHz



LR75 80 GHz



244LD LevelStar



167LP



Level, density, and interface measurements

The right measurements on the level

We apply superior Schneider Electric technology and experience to continuously measure the level, interface, or density of liquids in industrial processes. Based on the proven Archimedes buoyancy principle and utilizing no moving parts, our level transmitters are rugged and extremely reliable, requiring virtually no maintenance.

They also supply precise measurements, even at extreme process temperatures from -196 °C to +500 °C (-320 °F to +930 °F) and pressures from vacuum to 500 bar.

Our loop-powered buoyancy transmitters offer HART® and FOUNDATION™ Fieldbus communication. LCD displays and push buttons make calibration and adjustments easy. Their process-wetted materials available are carbon steel, stainless steel, Inconel, Duplex, and Hastelloy C. To withstand your challenging process environment the 244LD is available with ATEX, FM, CSA, EAC, NEPSI and INMETRO ratings, explosion-proof and intrinsically safe options. In addition, the safe buoyancy instrument is approved for SIL2 applications with a proof-test interval up to 5 years.



244LD LevelStar Buoyancy transmitter

Our level transmitter family

The 244LD LevelStar Buoyancy transmitter is the flagship product for the range of buoyancy transmitters offered. Its rugged design for extreme process temperatures makes it a top choice for all industrial process level measurements.

The 167LP Pneumatic transmitter is used for measuring level, interface, or density of liquids. The transmitter converts the lifting force of the displacer body to a pneumatic output. It is ideal for extreme process level measurements.



167LP Pneumatic transmitter

Selection guide

Buoyancy/displacer level



Model	244LD LevelStar	167LP LevelStar
Type/design	Sandwich mounted	Sandwich mounted
Measurements	Level, interface, density	Level, interface, density
Size	DN70/80/100 ANSI 3"/4"	DN80/100 ANSI 3"/4"
Accuracy	±0.2% at level, density, and interface measurement. Increased accuracy with customized adjustments.	Relative error <1%
Pressure range	Full vacuum up to 500 bar/7,250 psi	Full vacuum up to 250 bar/3,625 psi
Process temperature range	-196 °C to +500 °C (-320 °F to +932 °F)	-196 °C to +500 °C (-320 °F to +932 °F)
Ambient temperature range	-50 °C to +85 °C (-58 °F to +185 °F)	-50 °C to +90 °C (-58 °F to +194 °F)
Measuring range	Up to 50 m/165'	Up to 50 m/165'
Body material ¹	316L Stainless Steel, 321, Duplex Inconel® 625, 825 Carbon Steel Hastelloy C	316 Stainless Steel Carbon Steel Hastelloy C
Housing material	Aluminum and Stainless Steel	Aluminum
Certifications and approvals	ATEX ia/d, FM, CSA, EAC, NEPSI, INMETRO SIL2, NACE	ATEX ia/d NACE
Communication protocols	HART®, FOUNDATION™ Fieldbus	Pneumatic
Protection category	IP66	IP55/IP65
Accessories	Heating/cooling	Heating/cooling
Specifications*	PSS EML0171 G	PSS EML0110 A

¹ Others on Request.

* Please use this term in our search window on www.schneider-electric.com to access more product details.



Radar

Schneider Electric's radar level measurement devices offer accurate, reliable level measurement for the widest choice of installation and applications.

A complete radar lineup of guided wave and free space radars for solid and liquid applications offers state-of-the-art measurement technology combined with robust and durable design for a life cycle of reliability. Device features include unique 360-degree rotation, which allows for side or top mounting, making it much simpler to fit into an existing space. For greater ease, all radar instruments feature a user-friendly external display, offering easy, intuitive configuration for a new operator. To keep your plant safe, options include SIL2 certifications, dual seal technologies featuring Metaglas, remote displays to keep personnel from climbing tanks, and removeable electronics to ensure trouble free antenna installation.

Benefit to guided wave radar

The LG01 Guided Wave Radar transmitter is designed to be the most reliable style of radar available. Its never-lost signal performs continuous level measurement in a wide range of industries and applications. A modular design of housing and sensor ensures suitability for a variety of mounting positions and applications. It's a universal measurement device for liquids and solids.

Benefit to free space radar

A complete lineup of Frequency Modulated Continuous Wave (FMCW) free space radars incorporate advanced technology and algorithms to ensure easy setup and reliable, accurate, repeatable operation. FMCW technology allows additional reliability with up to 100 times more signals compared to a pulse burst radar.

Whether your application features challenges such as heavy dust, buildup, or corrosive material, Schneider Electric's complete offer supplies your application with accurate level measurement of $\pm 2 \text{ mm}/\pm 0.08''$ over ranges up to 100 m/328 ft. LR75 and LR65 80 GHz radar technology features a radar beam that works in the most difficult applications including nozzles and tank top isolation valves. An ability to measure very low reflectivity material and a signal that avoids obstacles allow use in several applications. Popular 24 GHz radar featured in LR54, LR74, and LR64 is versatile and reliable using the optional Drop antenna to avoid problems with buildup and condensation. 10 GHz LR01 has a proven track record of working with agitation, vapors, and challenging foam applications. All radars are designed to be easy setup for measurement of liquids, pastes, solids, powders, and slurries in all process industries.



Selection guide

Level instrumentation

↑ Recommended
↔ Limited
↓ Not recommended

		Differential pressure (d/p)/hydrostatic	Gauge pressure/hydrostatic	Multivariable	Buoyancy/displacer	Purged bubble tube	Guided wave radar	Free space radar
Why choose this technology		- Low priced/economical - Most popular/well understood - Wide measurement range - Independent of obstacles - Same transmitter can be used for numerous applications (flow, filter monitoring)	- Similar technology to d/p cell - Most popular/well understood - Wide measurement range - Independent of obstacles - Same transmitter can also be used for pressure measurement	- Based on well-known d/p cell technology - One transmitter with three measurement outputs¹¹	- Ability to measure density - Very robust and rugged - High Temp. (932 F) / High Pressure (7251 PSIG) - Not affected by vapor levels during interface measurement	- Economical - Versatile — doesn't require flanged tank connection - Keeps transmitter away from hot processes - Uses well understood d/p cell technology - No worry about process liquid crystallizing in tubing	- Easy mounting position - Independent of media - Wide measurement range - Quick and easy setup	- Easy mounting position - Independent of media - Wide measurement range - Quick and easy setup
Contact/non-contact measurement		contact	contact	contact	contact	contact	contact	noncontact
Application	Liquid level measurement with changing density	↔ ¹	↔ ¹	↑	↔ ³	↓	↑	↔ ¹²
	Density measurement	↔ ^{6 7}	↔ ^{6 7}	↔ ^{6 7}	↑	↑ ⁴	↓	↓
Media conditions	Measuring volume	↔ ²	↔ ²	↔ ²	↑	↔	↑	↑
	Applications with foam	↑	↑	↑	↔	↑	↑	↔
	Solids	n/a	n/a	n/a	n/a	n/a	↑	↑
	High viscosity or waxy fluids	↔ ¹	↔ ¹	↔ ¹	↔ ³	↔	↔	↑
	Slurries	↔ ¹	↔ ¹	↔ ¹	↔	↔	↔	↑
	Wavy/turbulence	↑	↑	↑	↔	↔	↑	↑
	Corrosive media ¹⁵	↔ ¹	↔ ¹	↔ ¹	↑	↑	↔	↑
	Low dielectric <2.0	↑	↑	↑	↑	↑	↑	↑
	Temperature up to 572 °F (300 °C)	↑ ⁸	↑ ⁸	↑ ⁸	↑	↑	↑	↓
	Vacuum pressure	↑	↓	↑	↑	↓	↑	↑
Install	Pressure up to 1450 psig (100 barg)	↑	↑	↔	↑	↓	↓	↑
	Agitator/obstacles in way of measurement	↑	↑	↑	↔ ⁵	↑ ⁹	↓	↑
Process Connection Conditions	Enclosed (not vented to atmosphere) vessel	↑	↔ ¹⁰	↑	↑	↓	↑	↑
	Compatible with threaded connection	↑	↑	↑	n/a	↑	↑	↑
	Uses process flanged connection	↑	↑	↑	↑	↓	↑	↑
	Connects to diaphragm seal/pressure seal	↑	↑	↑	n/a	↓	n/a	n/a
	Installed with instrument/hydraulic tubing	↑	↑	↑	n/a	↑	n/a	n/a
	Manifold connection available	↑	↑	↑	n/a	↑	n/a	n/a
	Offers sanitary connection and fill fluids (tri clamp, tank spud)	↑	↑	↑	n/a	↓	↓	↓
	Top of tank connection/entry	n/a	n/a	n/a	↑ ⁵	↑	↑	↑
	Side/top of tank connection/entry	n/a	n/a	n/a	↔	↑	↑	↑
	Side/bottom of tank connection/entry	↑	↑	↑	↓	↑	n/a	n/a
Bottom of tank connection/entry		↑	↑	↑	↓	↑	n/a	n/a

1. With diaphragm seal/pressure seal, use of capillaries may require heat trace

2. With symmetrical cylindrical vertical tank — use of 3rd party display device facilitates volume output

3. May require tank/chamber heating to avoid solidification

4. Refer to MI 020-328

5. Must use side chamber for installation; not recommended to use from top of tank install with agitator, obstacles

6. Requires use of two transmitters at known distance or dp or multivariable with diaphragm seals at known distance
7. Refer to mi 020-369

8. Do not direct mount transmitter next to high temperature process; remote mounting may be necessary to keep transmitter electronics below 185 °F

9. If it is impractical to immerse bubble tubes in the tank (because the tank has a mixer and/or baffles, or because the liquid is corrosive, etc.), The bubbles can be introduced through connections at the side of the tank. Bubble tube assembly should be located in area of representative liquid, and where liquid agitation is at a minimum
10. Requires use of two gauge or absolute transmitters - level calculation is completed in DCS or PLC

11. Recommend accessory: HIM smart HART loop interface and monitor available from Schneider Electric PN# HIM-HART

12. Must be coupled with differential pressure or multivariable transmitter and PID controller such as SCADAPack™ 4102

Selection guide

Radar level instrumentation

		LG01 Guided-Wave Radar	LR01 Free-Space Radar 10 GHz FMCW	LR54 Free-Space Radar 24 GHz FMCW	LR64 Free-Space Radar 24 GHz FMCW	LR74 Free-Space Radar 24 GHz FMCW	LR65 Free-Space Radar 80 GHz FMCW	LR75 Free-Space Radar 80 GHz FMCW
Why choose this technology		- Liquid and solid applications - Applications with foam	- Liquid applications - Applications with foam	Liquid applications	- Solids applications - Applications with larger solids material such as granulates or rocks - Installations with heavy buildup potential	- Liquid applications - Agitated and corrosive media - Dual safety seal requirements - High pressure / high temperature applications	- Solids applications - Applications with powders and dust - High and narrow silos installations - Installation close to tank wall	- Liquid applications - Very low dielectric constants - Applications with long nozzles and internal obstructions - Installation close to tank wall
Contact/non-contact measurement		contact	noncontact	noncontact	noncontact	noncontact	noncontact	noncontact
Application	Liquid (clean) level	↑	↑	↑	↓	↑	↓	↑
	Interface (liquid/liquid) ¹	↔	↔	↔	↓	↔	↓	↔
Media conditions	Applications with foam	↑	↔	↔	↓	↔	↓	↔
	High viscosity or waxy fluids	↔	↑	↑	↓	↑	↓	↑
	Buildup/coating	↔	↔	↑	↑	↑	↑	↑
	Slurries	↔	↑	↑	↓	↑	↓	↑
	Wavy/turbulence	↑	↑	↔	↓	↑	↓	↔
	Corrosive media	↔	↑	↔	↓	↑	↓	↔
	Low dielectric <2.0	↑	↔	↔	↔	↔	↑	↑
	Temperature up to 392 °F (200 °C)	↑	↑	↓	↓	↑	↑	↑
	Pressure up to 1450 psig (100 barg)	↓	↓	↓	↓	↑	↓	↓
	Solids — rocks and granulates	↑	↓	↓	↑	↓	↔	↓
Installation	Solids — powders and dusty atmosphere	↑	↓	↓	↔	↓	↑	↓
	Agitator/obstacles in way of measurement	↓	↑	↔	↔	↔	↓	↓
	High, long narrow nozzles	↔	↓	↔	↔	↔	↑	↑
	Small tank height 8" (20cm)	↓	↓	↔	↓	↔	↓	↑
	Stilling wells and bypass chambers	↑	↑	↑	↓	↑	↓	↔
	Open pit/open air ²	↑	↓	↑	↑	↑	↑	↑
	Mount outside and measure through non-conductive (plastic) tanks ²	↓	↔	↑	↓	↑	↓	↑
	Side of tank connection/entry	↓	↑	↓	↓	↓	↓	↓

1. All radar can be used as part of an interface system - must be coupled with differential pressure or multivariable transmitter and pid controller such as SCADAPack™ 4102

2. When using any type of radar in an open vessel, check local regulations for rules/laws regarding potential stray radar emissions

Selection guide

Radar



	LG01	LR01
Application	For liquids and solids in storage and process applications	For liquids in storage and process applications
Frequency range	L-band/1 GHz	X-band/10 GHz
Dielectric constant	≥1.4 (TBF 1.1)	≥1.8 (TBF 1.1)
Measuring range	0 to 40 m/0 to 130 ft	0 to 30 m/0 to 98 ft
Accuracy	±3 mm/±0.1”	±5 mm/±0.2”
Repeatability	±1 mm/±0.04”	±1 mm/±0.04”
Converter	C (compact), F (field remote)	C (compact), F (field remote)
Housing material	Aluminum, stainless steel	Aluminum, stainless steel
Ingress protection	IP 66, 67; NEMA 4X	IP 66, 67; NEMA 4X
Antenna installation*	LPR and TLPR*	TLPR*
Antenna type (material), size (beam angle — if applicable)	Double rod, single rod, single rod (segmented), coaxial, double cable, single cable Ø2 mm/.08”, single cable Ø4 mm/.15”	Metallic Horn: (316L) DN65/2.5” (for bypass chamber), Metallic Horn: (316L) DN80-200/3-8” (32-12°) Wave Horn: (PP or PTFE) Ø43 mm/1.69” (20°), Metallic Wave Guide: (316L) Ø30 mm/1.18”
Process connection	Thread: G½, G¾, G1, G1½, ½ NPT, ¾ NPT, 1 NPT, 1½ NPT	Thread: G1½, G2, 1½ NPT, 2 NPT; Flange: DN50- 200, 2-8”, 50-200A
Gasket	FKM/FPM, Kalrez® 6375, EPDM, PFA	FKM/FPM, Kalrez® 6375, EPDM, PFA
Ambient temperature	-40 to +80 °C/-40 to +176 °F	-40 to +80 °C/-40 to +176 °F
Process temperature	-60 to +300 °C/-58 to +572 °F (higher on request)	-60 to +250 °C/-76 to +482 °F (higher on request)
Process pressure	-1 – 40 barg/-14.5 – 580 psig (higher on request)	-1 – 40 barg/-14.5 – 580 psig
Power supply	11.5-30 V DC (Exi), 13.5 – 36 V DC (Exd), 2-wire	11.5-30 V DC (Exi), 13.5 – 36 V DC (Exd), 2-wire
Output	2-wire: 4-20 mA (HART® 6), FOUNDATION™ Fieldbus, PROFIBUS PA	2-wire: 4-20 mA (HART® 6), FOUNDATION™ Fieldbus, PROFIBUS PA
Accessories	Weather protection	Antenna extensions of various shapes and lengths, heating/cooling systems for metallic horn antennas, weather protection
Options	METAGLAS® dual safety sealing probe made of Hastelloy® C-22 or probe with a PVC, PVDF or PP protective sheath	METAGLAS® dual safety sealing
Approvals	ATEX, IECEx, cFMus, ÒÙĐÍ×ô, INMETRO, NACE, CRN	ATEX, IECEx, cFMus, ÒÙĐÍ×ô, INMETRO, NACE, CRN
SIL approval	SIL2	SIL2
PSS link	PSS EML3010 A-(en)	PSS EML3010 A-(en)

* LPR (Level Probing Radar): The antenna can be installed in a closed tank as well as outside. The antenna needs to point
**Approval pending

Selection guide

Radar (continued)



	LR54	LR74
Application	For liquids in basic process applications	For agitated and corrosive liquids applications
Frequency range	K-band/24 GHz	K-band/24 GHz
Dielectric constant	≥1.4 (TBF 1.1)	≥1.4 (TBF 1.1)
Measuring range	0 to 100 m/0 to 328 ft	0 to 100 m/0 to 328 ft
Accuracy	±2 mm/±0.08"	±2 mm/±0.08"
Repeatability	1 mm/±0.04"	1 mm/±0.04"
Converter	C (compact), F (field remote)**	C (compact), F (field remote)**
Housing material	Aluminum, stainless steel	Aluminum, stainless steel
Ingress protection	IP66, 68; 0.1 barg/1.45 psig	IP66, 68; 0.1 barg/1.45 psig
Antenna installation*	LPR and TLPR*	LPR and TLPR*
Antenna type (material), size (beam angle — if applicable)	Metallic Horn: (316L) DN40-200/1.5-8" (17-5°) Drop (PP): DN80/3" (9°), DN100/4" (7°), DN150/6" (5°)	Metallic Horn: (316L) DN40-200/1.5-8" (17-5°) Drop (PEEK): DN80/3" (9°), Drop (PTFE): DN80/3" (8°), DN100/4" (7°), DN150/6" (4°)
Process connection	Thread: G1, G1½, 1 NPT, 1½ NPT; Flange: DN40-200, 1½ – 8", 40-200A	Thread: G1½, 1½ NPT; Flange: DN40-200, 1½ – 8", 40-200A
Gasket	FKM/FPM, EPDM, Kalrez® 6375	FKM/FPM, EPDM, Kalrez® 6375
Ambient temperature	-40 to +80 °C/-40 to +176 °F	-40 to +80 °C/-40 to +176 °F
Process temperature	-50 to +130 °C/-58 to +266 °F	-50 to +200 °C/-58 to +392 °F (higher on request)
Process pressure	-1 – 16 barg/-14.5 – 232 psig	-1 – 100 barg/-14.5 – 1450 psig (higher on request)
Power supply	12 – 30 V DC (Exi), 16 – 36 V DC (Exd), 2-wire	12 – 30 V DC (Exi), 16 – 36 V DC (Exd), 2-wire
Output	2-wire: 4-20 mA (HART® 7), FOUNDATION™ Fieldbus**, PROFIBUS PA**	2-wire: 4-20 mA (HART® 7), FOUNDATION™ Fieldbus**, PROFIBUS PA**
Accessories	Antenna extensions in metal or PP, purging system, flange plate protection made of PP, weather protection, mounting brackets	Antenna extensions in metal or PTFE, purging/heating/cooling systems for metallic horn antennas, flange plate protection made of PTFE or PEEK, weather protection, mounting brackets
Options	M12 4-pin connector eliminates mis-wiring and speeds install	METAGLAS® dual safety sealing; M12 4-pin connector eliminates mis-wiring and speeds install
Approvals	ATEX, IECEx, cQPSus, NEPSI, NACE, CRN - ASME B31.3**	ATEX, IECEx, cQPSus, NEPSI, NACE, CRN - ASME B31.3**
SIL approval	Developed acc. to SIL2/3, IEC 61508 – 2010. The SIL approval is in the process of validation by TÜV Süd, Germany.**	Developed acc. to SIL2/3, IEC 61508 – 2010. The SIL approval is in the process of validation by TÜV Süd, Germany.**
PSS link	PSS 2A-7A5 A en	PSS 2A-7A3 A en

* LPR (Level Probing Radar): The antenna can be installed in a closed tank as well as outside. The antenna needs to point
**Approval pending

Selection guide

Radar (continued)



	LR75	LR64	LR65
Application	For liquids in narrow tanks with internal obstructions	For solids from granulates to rocks	For powders and dusty atmosphere
Frequency range	W-band/80 GHz	K-band/24 GHz	W-band/80 GHz
Dielectric constant	≥ 1.4 (TBF 1.1)	≥1.4 (TBF 1.1)	≥1.4 (TBF 1.1)
Measuring range	0 to 100m/0 to 328 ft	0 to 100m/0 to 328 ft	0 to 100m/0 to 328 ft
Accuracy	±2 mm/±0.08"	±2 mm/±0.08"	±2 mm/±0.08"
Repeatability	±1 mm/±0.04"	±1 mm/±0.04"	±1 mm/±0.04"
Converter	C (compact)	C (compact)	C (compact)
Housing material	Aluminum, stainless steel	Aluminum, stainless steel	Aluminum, stainless steel
Ingress protection	IP66, 68; 0.1 barg/1.45 psig	IP66, 68; 0.1 barg/1.45 psig	IP66, 68; 0.1 barg/1.45 psig
Antenna installation*	LPR and TLPR*	LPR*	LPR*
Antenna type (material), size (beam angle — if applicable)	Lens (PEEK): DN20; 3/4" (15°), DN25; 1" (10°), DN40; 1.5" (8°), DN70; 2.75" (4°)	Metallic Horn: (316L) DN80...200; 3...8" (9...5°); Drop (PP): DN80; 3" (9°), DN100 4" (7°), DN150; 6" (5°); Drop (PTFE): DN80; 3" (8°), DN100; 4" (7°), DN150; 6" (4°)	Lens (PEEK): DN40; 1.5" (8°), DN70; 2.75" (4°)
Process connection	Thread: G3/4, G1, G11/2, G3, 3/4 NPT, 1 NPT, 11/2 NPT, 3 NPT Flange: DN50...200, 2...8", 50...200A	Thread: G1, G1½, 1 NPT, 1½ NPT; Flange: DN80-200, 3-8", 80-200A	Thread: G1½, G3, 1½ NPT, 3 NPT Flange: DN50-200, 2-8", 50-200A
Gasket	FKM/FPM, EPDM, Kalrez® 6375	FKM/FPM, EPDM, Kalrez® 6375	FKM/FPM, EPDM, Kalrez® 6375
Ambient temperature	-40 to +80°C/-40 to +176°F	-40 to +80 °C/-40 to +176 °F	-40 to +80 °C/-40 to +176 °F
Process temperature	-50 to +200°C/-58 to +392°F	-50 to +130 °C/-58 to +266 °F	-50 to +200 °C/-58 to +392 °F
Process pressure	-1 – 40 barg/-14.5 – 580 psig	-1 – 16 barg/-14.5 – 232 psig	-1 – 40 barg/-14.5 – 580 psig
Power supply	12 – 30 V DC (Exi), 16 – 36 V DC (Exd), 2-wire	12 – 30 V DC (Exi), 16 – 36 V DC (Exd), 2-wire	12 – 30 V DC (Exi), 16 – 36 V DC (Exd), 2-wire
Output	2-wire: 4-20 mA (HART® 7), FOUNDATION™ Fieldbus**, PROFIBUS PA**	2-wire: 4-20 mA (HART® 7), FOUNDATION™ Fieldbus**, PROFIBUS PA**	2-wire: 4-20 mA (HART® 7), FOUNDATION™ Fieldbus**, PROFIBUS PA**
Accessories	Antenna extensions in metal, purging system, flange plate protection made of PEEK, weather protection, mounting brackets	Antenna extensions, slanted flange, purging system, weather protection, mounting brackets	Antenna extensions, slanted flange, purging system, weather protection, mounting brackets
Options	M12 4-pin connector eliminates mis-wiring and speeds install	M12 4-pin connector eliminates mis-wiring and speeds install	M12 4-pin connector eliminates mis-wiring and speeds install
Approvals	ATEX, IECEx, cQPSus, NEPSI, NACE, CRN - ASME B31.3**	ATEX, IECEx, cQPSus, NEPSI, NACE, CRN - ASME B31.3**	ATEX, IECEx, cQPSus, NEPSI, NACE, CRN - ASME B31.3**
SIL approval	Developed acc. to SIL2/3, IEC 61508 – 2010. The SIL approval is in the process of validation by TÜV Süd, Germany.**	Developed acc. to SIL2/3, IEC 61508 – 2010. The SIL approval is in the process of validation by TÜV Süd, Germany.**	Developed acc. to SIL2/3, IEC 61508 – 2010. The SIL approval is in the process of validation by TÜV Süd, Germany.**
PSS link	PSS 2A-7A4 A en	PSS 2A-7A1 A en	PSS 2A-7A2 A en

* LPR (Level Probing Radar): The antenna can be installed in a closed tank as well as outside. The antenna needs to point

**Approval pending