

# Which radar level measurement transmitter is ideal for your application?

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SITRANS LR and SITRANS LG radar level measurement transmitters are the solution for any solids, liquids, or interface application.

Answers for industry.

**SIEMENS**

# Maintenance-free radar technology for any application

The versatile line of Siemens radar level measurement transmitters gives you the right radar technology to fit your application. Siemens offers pulse, FMCW (Frequency Modulated Continuous Wave), guided wave, contacting, non-contacting technologies, and 2-wire or 4-wire installation. A wide range of antennas, process connections, and mounting options are also available for accurate, reliable, and cost-effective level measurement and control.

Whatever your process condition requirements, Siemens has a cost-effective solution. Siemens radar transmitters are simple to install and operate, saving time and money. Traditional radar transmitters are complicated and require significant setup. Radar technology is unaffected by temperature, pressure, vapor, or extreme dust and can measure applications up to 100 meters (329 ft). Radar technology offers answers to these challenging conditions that other technologies struggle with. Custom configurations are available upon request, ensuring Siemens has the answers for your unique application needs.

## **Quality**

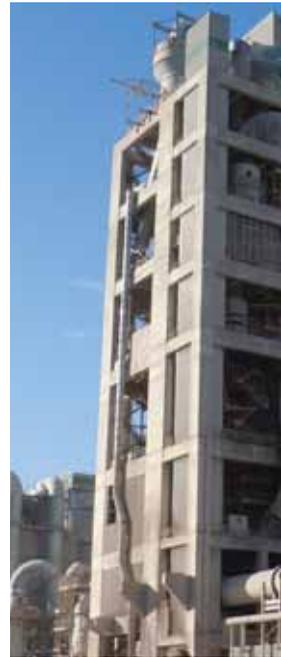
SITRANS LR and SITRANS LG transmitters are manufactured to the quality standards of ISO 9001:2008 and to the environmental standards of ISO 14001:2004. Siemens global support network provides experienced technical help when and where you need it.

## **Experience**

Siemens level measurement instruments come with extensive field experience. Siemens signal processing technology for level instruments is based on the experience of over a million instruments in industrial applications including: mining, aggregate, cement, water/wastewater, food and beverage, pharmaceutical, chemical, and petrochemical. Siemens understands the importance of reliability and knows what it means to have trusted and accurate instruments for demanding applications. That's why Siemens engineers invented Process Intelligence and Auto False-Echo Suppression, and that's why these instruments carry so many patents. Siemens puts the experience of a million applications into one instrument.

## **Trusted**

Industry leaders recognize the quality and durability of Siemens transmitters. Be it a large tank farm or a single vessel, Siemens transmitters can stand alone or be integrated in a network. You can have localized control or sophisticated data management and diagnostics in your plant or across the internet.





## Whatever the condition, it's covered

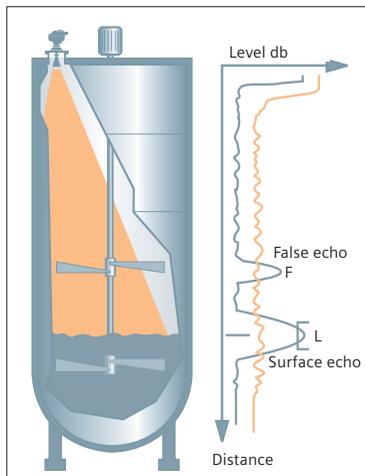
Conditions	SITRANS LR560	SITRANS LR460	SITRANS LR250	SITRANS Probe LR	SITRANS LR200	SITRANS LR400	SITRANS LG200
<b>Solids</b>							
Abrasive materials	●	●					
Non-abrasive	●	●					●
Material buildup	●	●					●
Extreme dust	●	●					●
Steep angle of repose	●	●					●
Dielectric properties* < 2.0	●	●					●
Range > 10 m (33 ft)	●	●					●
Range > 40 m (132 ft)	●	●					●
<b>Liquids</b>							
Process vessels			●	●	●	●	●
Storage vessels			●	●	●	●	●
Slurries			●	●	●	●	●
Agitated			●	●	●	●	●
Foam			●	●	●	●	●
Vacuum or nominal pressure			●	●	●	●	●
Pressure > 40 bar g							●
Temperature > 200 °C (392 °F)						●	●
Viscosity > 10,000 cP (molasses)			●	●	●	●	●
Material buildup			●	●	●	●	●
Dielectric properties ≤ 1.6			●	●	●	●	●
Ammonia							●
High pressure steam			●				●
By-pass pipe			●		●	●	●
Interface (liquid/liquid)							●
Nozzles < 39 mm (1.5") diameter							●
Center mounting location			●			●	●

● preferred  
● condition-dependent

\* Dielectric properties are the material's ability to reflect microwave energy; the higher the value, the better the reflective properties.

# Easy-to-use, sophisticated, level measurement

Siemens transmitters are easy to install and configure. With the Quick Start Wizard at the local interface or via remote communications, configuration of Siemens transmitters couldn't be easier. Once installed, level measurement readings can be reviewed locally on the transmitter's display, on a remote display, or in the control room. When used in conjunction with SITRANS RD500, Siemens transmitters can transmit information remotely via the internet.



Process Intelligence uses Area (A), Largest (L), and First (F) algorithms to dynamically select the true surface echo when false echos are present.

## Installation ease

Siemens radar transmitters come in a variety of process connections (threaded, flanged, or sanitary) to meet most installation needs. Easy-Aimers are available to position the transmitter on the correct angle to ensure reliable level measurement of solids materials.

## Configuration ease

Siemens graphical Quick Start Wizards easily guide users through the configuration process. Using the infrared handheld programmer or the local display buttons, Siemens radar transmitters are operational in minutes. For centralized transmitter configura-

tion, asset management functions, or advanced diagnostics, SIMATIC PDM (Process Device Manager) offers additional Quick Start Wizards. Operation via AMS and FDT (such as PACTware and Fieldcare) via SITRANS DTM are also available.

## Process Intelligence

Process Intelligence, Siemens advanced method of processing echo profiles, guarantees reliable and accurate level measurement. The signal processing provides exceptional reliability and automatically ignores obstructions via Auto False-Echo Suppression.



### Remote digital displays

Siemens remote displays, SITRANS RD100 and SITRANS RD200, provide the flexibility of having a display where it is needed – in the field, in a panel, or in the control room.

### Remote monitoring via the internet

SITRANS RD500 allows remote monitoring of SITRANS radar transmitters via the internet using standard communication options such as Ethernet and cellular GPRS modem. This is the ideal complement to any remote monitoring application, allowing direct access to radar transmitter readings via any computer (such as smart phones, laptops, or any device supporting a web browser, email, or sms).

### Communication flexibility

Siemens provides communication flexibility. Siemens Totally Integrated Automation (TIA) approach offers ease of connection to a DCS system such as SIMATIC PCS 7 using industrial standards such as HART, PROFIBUS and FOUNDATION Fieldbus.



In addition to remote monitoring and reporting SITRANS RD500 also provides these remote features:

- configuration
- viewing of transmitter data
- datalogging
- event alarming
- reporting and messaging



SITRANS RD500



SITRANS RD200

SITRANS RD100

# Your answer to all solids level measurement applications

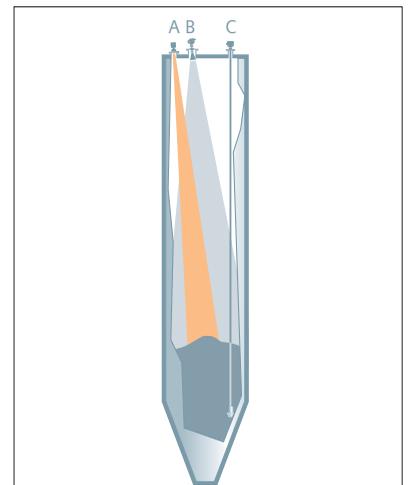
SITRANS LR560 is the easiest and most reliable radar transmitter on the market. With a high frequency of 78 GHz, 4° narrow beam, and short wavelength, it performs reliably on solids material from practically any installation location.

Extreme dust? No problem. Siemens pioneered radar technology for solids level measurement. The 2-wire, loop powered, FMCW SITRANS LR560 is the state-of-the-art transmitter for continuous solids level measurement. Operating at 78 GHz, it features a unique lens antenna that is highly resistant to build-up making it maintenance free. The narrow 4° beam means SITRANS LR560 can be installed practically anywhere on your silo. You don't need to worry how close you are to the sides and its small size fits most nozzles. 78 GHz creates a short wavelength that yields extremely good signal reflections from almost any solids material, even on a steep slope. With the local interface push buttons or infrared handheld programmer, the

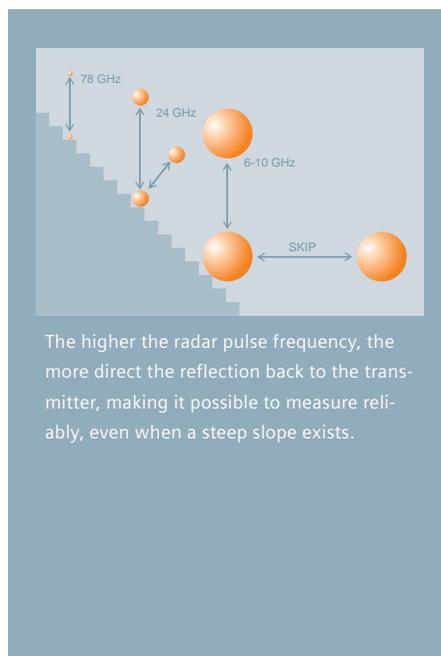
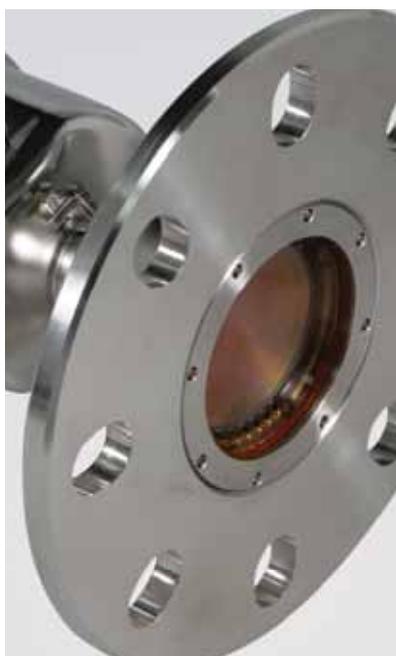
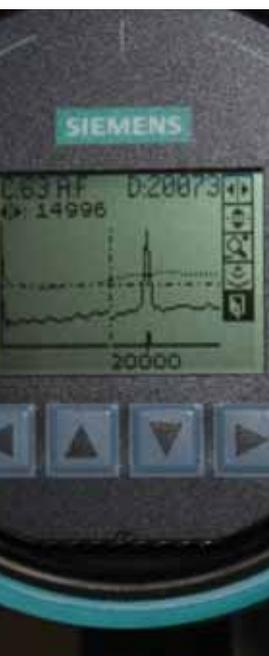
graphical Quick Start Wizard guides you through a simple setup and within a few minutes the transmitter is up and running. No other radar level transmitter for solids is this easy, cost effective, and maintenance free.

For extremely low dielectric, low density powders, SITRANS LR460 is the preferred solution. Featuring a horn antenna with an 8° beam, the 4-wire FMCW SITRANS LR460 has proven itself in thousands of applications.

For small process connections or short ranges, SITRANS LG200 guided wave radar transmitter provides simple setup, fast response rates, and reliable performance in granules and powders.



SITRANS LR560 (A) has a narrow beam compared to the SITRANS LR460 (B). The SITRANS LG200 (C) signal is guided by a cable for specific measurements where the material touches the cable.



# Reliable and accurate liquids level measurement

Siemens large selection of radar transmitters for liquid level measurement offers the right solution for your application. Siemens radar transmitters handle applications ranging from simple storage vessels to complex demanding process vessels.

SITRANS LR250 is the first choice for liquids level measurement in storage and process vessels to 20 meters (66 ft). Its high frequency and small antenna makes it easy to use and easy to install. It offers reliable level measurement in liquids with low dielectric constants like hydrocarbons.

For applications ranging from 20 to 50 meters (66 to 164 ft), SITRANS LR400 offers high performance on low dielectric media.

For process vessels which may include turbulence, buildup, or foam, SITRANS LR200 is the best choice.

Its low frequency better suits this environment, and functions reliably in applications up to 20 meters (66 ft). Agitation and interference in the vessel is managed with Process Intelligence.

For low-cost level measurement, SITRANS Probe LR offers a small process connection and operates at a low frequency. It can be used on liquids and slurries up to 20 meters (66 ft). Simple configuration and programming makes the Probe LR a cost-effective solution.



# Guided wave radar for level measurement and interface applications on liquids

SITRANS LG200 is Siemens 2-wire guided wave radar transmitter for short- to medium-range level, level/interface, and volume measurement of liquids and slurries. Its many antenna configurations make it possible to solve numerous complex applications, even ammonia, chlorine, high temperature/pressure, or cryogenics.

SITRANS LG200 measures level up to 22.5 meters (77 ft), process temperatures from -196 to 427 °C (-320 to 800 °F), and full vacuum to 431 bar g (6250 psi g).

SITRANS LG200 has coaxial, rigid, and flexible single or twin rods for a wide range of applications. Standard probe materials are stainless steel and PFA/ FEP-coated. Other probe materials are available upon request.

Changes in material density and dielectric properties have no influence on SITRANS LG200 ensuring

dependable and accurate readings. Materials with dielectric constants as low as 1.4 such as hydrocarbons, including oils, LNG, and LPG, are easily monitored by SITRANS LG200. The safe guidance of electromagnetic waves along the antenna make these difficult materials easy to measure.

SITRANS LG200 can also measure the interface of differing fluids (such as oil/water) in separation processes. Programming the device for interface is simple. SITRANS LG200 can display and output (via HART) both the level and the interface variable, requiring

only one transmitter to be installed on the vessel.

SITRANS LG200 is rated for applications in safety-related systems, with requirements for functional safety to SIL 2 in accordance with IEC61508/ IEC61511-1.



# Ideal solutions, no matter what your application

SITRANS LR and SITRANS LG radar level measurement transmitters provide accurate and reliable level readings in a wide range of applications. From dry solids food applications to agitated process vessels, and everything in between, Siemens has an answer.

## Food

From sanitary water applications to long-range dusty grain silos, Siemens has a radar transmitter suitable for your application. From small indoor vessels to large outdoor tank farms containing liquids, SITRANS LG200 or SITRANS LR250 perform with high accuracy. For silos containing solid foods, SITRANS LR560 is the first choice for reliable measurement including those with extreme dust.

## Chemical

High temperatures, corrosive or abrasive chemicals, high pressure, and varying dielectric properties are typical conditions inside chemical plants. Siemens radar technologies and various antenna materials provide the right transmitter and antenna configuration to meet these tough conditions.

## Petrochemical

Vapors, high temperatures, steam, and high pressure are typical environments in the petrochemical industry. These challenging conditions are no match for SITRANS LR and SITRANS LG. The transmitters are found in remote monitoring applications, crude oil, produced water, bitumen, molten sulfur, petrol, liquified gases, oil/water interface, and plastic powders.

## Cement

Long ranges, high temperatures, and extreme dust are mainstays of the cement industry. Siemens radar transmitters have been trusted in the cement industry for many years, in thousands of level applications, from raw materials to finished cement. Non-contacting SITRANS LR560 or SITRANS LR460 mean zero maintenance and efficient, reliable process control.

## Steel

Challenges in this industry include extreme temperatures and dust. SITRANS LR560 and SITRANS LR460 continuous level measurement is unaffected by these conditions, even on molten metals. The air purge feature keeps the antenna cool.

## Power

Siemens is a global leader in this market segment; SITRANS LR and SITRANS LG transmitters are used in critical level measurement applications such as raw coal, pulverized coal, flyash, and boiler feed water.

## Application solutions: SITRANS LR and SITRANS LG provide integrated level measurement control

A malt manufacturer in Canada uses SITRANS LR and SITRANS LG radar transmitters throughout its process, saving money and time by replacing older mechanical technology which required regular maintenance.

SITRANS LR560 measures malted barley in an outdoor silo. The light-weight transmitter was easy to carry to the top of the silo and was configured using the infrared handheld programmer. The narrow 4° beam provides plug-and-play performance. No fine-tuning of the signal was required to achieve reliable and stable measurement in the lower cone area.

SITRANS LG200 measures wort level in a vessel. This hot, sticky, viscous, and foamy material is not an issue with guided wave technology. No other technology provides the same level of reliability in this application. With level readings the operators can trust, the plant operates more efficiently and safely with zero maintenance.

# Siemens radar portfolio technical specifications

	Solids		Liquids and slurries	
	SITRANS LR560	SITRANS LR460	SITRANS LR250	
				
<b>Order No.</b>	7ML5440	7ML5426	7ML5431	
	2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids, with material $dk > 2$ .	4-wire, 25 GHz FMCW radar level transmitter for continuous monitoring of solids, including low $dk < 2$ .	2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage/process vessels.	
<b>Range</b>	100 m (328 ft)	100 m (328 ft)	20 m (66 ft)	
<b>Process temperature</b>	-40 to 200 °C (-40 to 392 °F)	-40 to 200 °C (-40 to 392 °F)	-40 to 200 °C (-40 to 392 °F) at process connection with FKM O-ring	
<b>Process pressure</b>	Up to 3 bar g (43.5 psi g) option	0.5 bar g (7.25 psi g) max.	Up to 40 bar g (580 psi g), process connection type dependent	
<b>Key features</b>	<ul style="list-style-type: none"> <li>Process Intelligence – advanced echo processing for unparalleled performance</li> <li>78 GHz high frequency yields 4° beam and exceptional reflection from sloped surfaces</li> <li>Lens antenna for superb dust protection</li> <li>Air purge connection included</li> <li>Virtually unaffected by dust or temperature changes</li> <li>Graphical Quick Start Wizard for easy setup</li> <li>Push buttons or optional Intrinsically Safe infrared handheld programmer</li> </ul> <b>Options</b> <ul style="list-style-type: none"> <li>Easy Aimer for optimizing readings in the silo cone area</li> </ul>	<ul style="list-style-type: none"> <li>Process Intelligence – advanced echo processing for unparalleled performance</li> <li>Intrinsically Safe infrared handheld programmer</li> <li>Extremely high signal yields high performance (high signal-to-noise ratio)</li> <li>Virtually unaffected by dust or temperature changes</li> <li>Integrated Easy Aimer for optimizing signal on sloped surfaces</li> <li>Quick Start Wizard for setup</li> </ul> <b>Options</b> <ul style="list-style-type: none"> <li>PTFE antenna cover</li> <li>Purging (self-cleaning) for buildup protection</li> </ul>	<ul style="list-style-type: none"> <li>Process Intelligence – advanced echo processing for unparalleled performance</li> <li>Intrinsically Safe infrared handheld programmer</li> <li>Graphical user interface (LUI)</li> <li>Quick Start Wizard and display diagnostics</li> <li>Reliable and accurate – high signal-to-noise ratio</li> <li>Easy to install – small horn and narrow beam angle allows installation practically anywhere on your vessel</li> <li>Short blanking distance: up to 50 mm (2") from the end of the horn</li> </ul>	
<b>Communications</b>	<ul style="list-style-type: none"> <li>HART, PROFIBUS PA, or FOUNDATION Fieldbus</li> <li>Enhanced EDD for SIMATIC PDM, Emerson AMS, SITRANS DTM (for PACTware), 375/475 handheld, for configuration and diagnostics</li> </ul>	<ul style="list-style-type: none"> <li>HART or PROFIBUS PA</li> <li>Enhanced EDD for SIMATIC PDM for configuration and diagnostics</li> </ul>	<ul style="list-style-type: none"> <li>HART, PROFIBUS PA, or FOUNDATION Fieldbus</li> <li>Enhanced EDD for SIMATIC PDM, Emerson AMS, SITRANS DTM (for PACTware), 375/475 handheld, for configuration and diagnostics</li> </ul>	
<b>Approvals</b>	CSA <sub>USIC</sub> , CE, FM, ATEX, IECEx, R&TTE, Industry Canada, FCC, C-TICK, INMETRO, NEPSI	CSA <sub>USIC</sub> , CE, FM, ATEX, IECEx, R&TTE, Industry Canada, FCC, C-TICK, INMETRO	CSA <sub>USIC</sub> , CE, FM, ATEX, IECEx, C-TICK, R&TTE, Lloyd's Register of Shipping, ABS Type Approval, Bureau Veritas, Industry Canada, FCC, INMETRO, NEPSI	



			Liquids, slurries, solids, and interface
SITRANS Probe LR	SITRANS LR200	SITRANS LR400	SITRANS LG200
			
7ML543x	7ML542x	7ML5421	7ML1300 – transmitter 7ML130x – probe type
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids in storage vessels.	2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids. Ideally suited for more complex process vessels.	4-wire, 24 GHz FMCW radar level transmitter for continuous monitoring of liquids including extremely low dk < 2.0.	2-wire, guided wave radar transmitter for short- to medium-range level, level/interface, and volume measurement of liquids and solids.
20 m (66 ft)	20 m (66 ft)	50 m (164 ft)	22.5 m (75 ft)
-40 to 80 °C (-40 to 176 °F)	-40 to 200 °C (-40 to 392 °F)	-40 to 200 °C (-40 to 392 °F) <b>Option:</b> up to 250 °C (482 °F)	-196 to 427 °C (-320 to 800 °F)
Up to 3 bar g (43.5 psi g)	Up to 40 bar g (580 psi g), process connection type dependent	Up to 40 bar g (580 psi g), process connection dependent	Full vacuum to 431 bar g (6250 psi g), probe dependent
<ul style="list-style-type: none"> <li>Process Intelligence – advanced echo processing for unparalleled performance</li> <li>Intrinsically Safe infrared handheld programmer</li> <li>Patented, shielded, and hermetically sealed polypropylene antenna/process connection; 100 mm (4") shield standard</li> <li>Rotating head aligns with conduit for easy wiring</li> </ul> <b>Options</b> <ul style="list-style-type: none"> <li>250 mm (10") shield length</li> </ul>	<ul style="list-style-type: none"> <li>Process Intelligence – advanced echo processing for unparalleled performance</li> <li>Intrinsically Safe infrared handheld programmer</li> <li>Graphical user interface (LUI)</li> <li>Quick Start Wizard displays diagnostics</li> </ul> <b>Options</b> <ul style="list-style-type: none"> <li>Multiple antenna designs for application flexibility</li> <li>250 mm (10") shield length</li> <li>Purging (self-cleaning) for buildup protection</li> </ul>	<ul style="list-style-type: none"> <li>High signal-to-noise ratio</li> <li>Intrinsically Safe infrared handheld programmer</li> <li>Operates on low dk media</li> </ul> <b>Options</b> <ul style="list-style-type: none"> <li>High temperature operation with extension &gt; 200 °C (392 °F)</li> <li>Purging (self-cleaning) for buildup protection</li> </ul>	<ul style="list-style-type: none"> <li>Unaffected by change in density and dielectric properties of 1.4 and higher</li> <li>Accurate to 2.5 mm (0.1")</li> <li>Extended insertion length – probe lengths up to 22.5 m (75 ft)</li> <li>Push button configuration or HART communication</li> <li>SIL suitable</li> </ul> <b>Probe options</b> <ul style="list-style-type: none"> <li>Coaxial probes for steam, ammonia, overflow, interface and high pressure/high temperature</li> <li>Single rod probes (rigid including sanitary or cable)</li> <li>Twin rod (rigid or cable)</li> </ul>
<ul style="list-style-type: none"> <li>HART</li> <li>EDD for SIMATIC PDM for configuration and diagnostics</li> </ul>	<ul style="list-style-type: none"> <li>HART or PROFIBUS PA</li> <li>Enhanced EDD for SIMATIC PDM, Emerson AMS, SITRANS DTM (for PACTware), 375/475 handheld, for configuration and diagnostics</li> </ul>	<ul style="list-style-type: none"> <li>HART or PROFIBUS PA</li> <li>SIMATIC PDM for configuration and diagnostics</li> </ul>	<ul style="list-style-type: none"> <li>HART</li> <li>Enhanced EDD for SIMATIC PDM and 375/475 handheld for configuration and diagnostics</li> </ul>
CE, CSA <sub>US/CA</sub> , FM, ATEX, IECEx, Lloyd's Register of Shipping, ABS Type Approval, Industry Canada, FCC, R&TTE, C-TICK, INMETRO	CE, CSA <sub>US/CA</sub> , FM, ATEX, IECEx, Lloyd's Register of Shipping, ABS Type Approval, Industry Canada, FCC, R&TTE, C-TICK, INMETRO, NEPSI	CE, CSA <sub>NRTL/CA</sub> , FM, ATEX, Lloyd's Register of Shipping, ABS Type Approval, Industry Canada, FCC, R&TTE, C-TICK, INMETRO	CSA <sub>US/CA</sub> , CE, FM, Hazardous Approvals, ATEX, C-TICK, SIL-1, SIL-2, Lloyds Steam Approval

## Get more information

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