

ABB MEASUREMENT & ANALYTICS | DATA SHEET

LWT300 series

Guided wave radar level transmitter Level and interface level measurement



Measurement made easy

LevelExpert™: the expert inside

LevelExpert concentrates 20 years of industrial level measurement experience into an intelligent instrument made to accurately detect levels, even in the most demanding conditions.

Forget about baseline mapping and echo selection; LevelExpert knows how to find the right level through the clutter. The expert is now inside your guided-wave radar.

LWT300 series instruments cover a wide range of applications. They can meet your needs for applications up to 204 °C (400 °F) and 207 bar (3,000 psi).

Customer benefits

With fast and reliable settings, ABB's LWT300 series of instruments emphasizes measurement made easy. With its LevelExpert technology based on 20 years of experience, simply enter installation data and basic process conditions, and let LevelExpert do the rest: no echo mapping or baseline correction required.

Unlike traditional guided wave radar that uses device parameters requiring multiple adjustments, the LWT300 series of instruments does it for you. The instrument uses built-in intelligence to differentiate between the actual level and other false signals. It also keeps monitoring all these false signals while maintaining a reliable level reading. It is like having a level expert in each device.

ABB's LWT300-series transmitters are equipped with on-board diagnostics that can be used for safety monitoring, improved reliability, downtime reduction, and performance verification. Standard on-board diagnostics monitor minimum and maximum electronics temperatures, input voltage, probe loss or breakage, buildup detection, and leakage of the primary process seal. These diagnostic features assist you in troubleshooting common problems without extensive testing. They also allow device health monitoring without requiring removal from the process or taking the device offline, thus saving valuable time and improving uptime.

Main features

To meet the most challenging applications, the LWT300 series of instruments offers a wide range of configurations.

Temperature range: -50 to 204 °C (-58 to 400 °F)

Maximum process pressure: vacuum to 207 bar (3,000 psi)

- LevelExpert software for easy configuration, reliable surface detection and easy troubleshooting
- Alternative measurement method using threshold settings
- 2-wire powered, and HART 7 communication model, with SIL 2 (no redundancy), SIL 3 (redundant configuration)
- Modbus and LevelMaster communication models
- Certified for potentially explosive atmospheres



How the technology works

Guided wave radar uses very low power microwave energy to determine the level or interface of the products being measured.

To obtain optimum performance, it is important to understand the basic principles of operation. The instrument electronics housing (a.k.a. "the head") is fitted with a special adapter (the coupler) that serves as a connection between the head and the process in which measurements will be taken. A rod or cable (the probe) hangs from the coupler into the product being measured and acts as a wave guide. The probe guides the microwave energy to the product surface, instead of having it be dispersed in a cone, as it would if there was no probe.

A measurement cycle consists of the following:

The head sends a very short pulse of microwave energy through the coupler and down the probe \bigcirc . That pulse travels along the length of the probe \bigcirc \bigcirc and, when it encounters the product surface (or some other change in the dielectric constant), some of the energy is reflected and travels back towards the coupler \bigcirc \bigcirc \bigcirc \bigcirc . When the reflected energy reaches the coupler, it is sensed by the electronics \bigcirc . By measuring the time elapsed between the initial pulse and the reflected one, the electronics can calculate the product level \bigcirc .

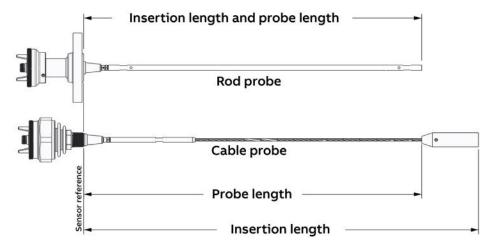


When two liquids are in the tank and are separated, if the dielectric constant difference between the two is more than 10, it is possible to detect the total level and the interface level at the same time. The radar wave will go through the first layer (having a low dielectric constant) and reach the top of the second layer (having a higher dielectric constant).

Since microwave energy travels at the speed of light, one complete measurement cycle is made up of several thousand pulses. The time domain reflectometry (TDR) sampling technique is used to reconstruct, from these numerous pulses, a waveform that can be processed by the instrument microprocessor. Depending on instrument configuration and probe length, measurement cycles are created up to five times every second. Results from these cycles are processed to generate a current output proportional to the level of the product.

How to measure probe length

The probe length is defined in one of two ways, depending on the type of process interface. For a threaded interface, the probe length is measured from the thread closest to the bottom of the coupler to the end of the probe, excluding accessories such as a cable weight. For a flanged interface, the probe length is measured from the bottom of the flange to the end of the probe, excluding accessories.

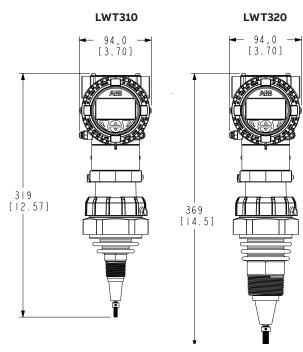


LWT310 vs. LWT320

The LWT300 series is comprised of the LWT310 and LWT320. The LWT310 fits in a 19-mm ($\frac{3}{4}$ -in.) NPT interface while the LWT320 fits in a 38-mm ($\frac{1}{2}$ -in.) NPT interface. Both are offered in flanged versions.

For solids applications, the LWT320 is recommended, since it can withstand a higher pull force. The LWT320 is also useful for applications with a 38 mm (1 $\frac{1}{2}$ -in.) NPT interface.

	LWT310	LWT320
NPT interface	19 mm (¾ in.)	38 mm (1 ½ in.)
Cable probe diameter	4.8 mm (¾ in.)	6.4 mm (½ in.)
Rod probe diameter	9.5 mm (3/s in.)	12.7 mm (½ in.)
Coaxial probe diameter	22 mm (1/8 in.)	n/a
Maximum pull force	450 kg (1,000 lb.)	635 kg (1,400 lb.)



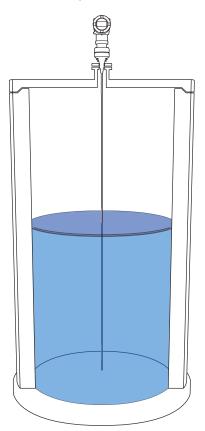
Applications

Storage vessel

Storage vessels are one of the most common applications for guided wave radar.

- Guided wave works where most other technologies fail because of its very strong signal-to-noise ratio (SNR) and its ability to master fluids with low or changing dielectrics.
- Instrument signal is not affected by mist, spray, turbulence, flashing, changing pressures or temperatures, or changing dielectrics.
- Foam generally does not affect the signal, but **excessive** foam can cause a negative offset.
- Light buildup can be managed, but heavy buildup should be avoided.
- Probe selection: rod and coaxial probes can be used at depths between 0.3 m (12 in.) and 6.1 m (20 ft.). Cable probes are preferred and can be used from 0.3 m (12 in.) up to 60 m (197 ft.).

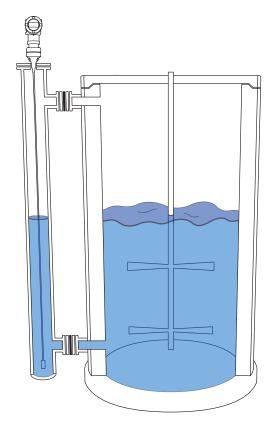
Note: Do not mount the probe where it can touch vessel walls or internal structures. Do not install the probe in the fill stream of the vessel. Coaxial probes or stilling wells are best if there is excessive foaming or installation in the fill stream that cannot be avoided. Rod and coaxial probes allow measurements very close to the EOP. Cable probes with a heavy weight should be used in extremely turbulent or agitated conditions. A tie-down should be considered if the probe must remain stationary.



External chamber/bridle/displacer replacement/MagWave™

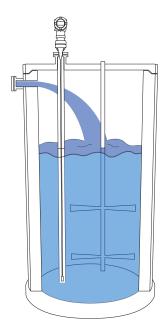
Applications such as boiler drums, feedwater heaters, compressed hydrocarbons and process vessels with multiple obstructions require external chambers.

The LWT310 guided wave radar is the best measurement choice for installation in external chambers, bridles, and displacer retrofits. Due to the concentrated signal, it is used for measuring low dielectric fluids. If a chamber is 100 mm (4 in.) or smaller, this actually helps to further concentrate the signal.



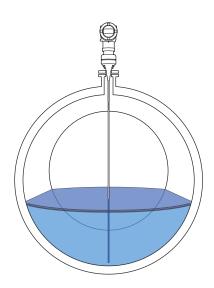
Stilling wells

Stilling wells are used if the probe must be installed in the process fill stream, to avoid obstructions and agitators, as well as to retain signal strength in applications with very low dielectric fluids and long measuring lengths.



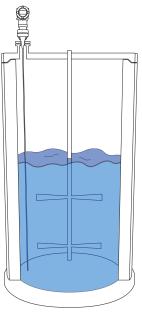
Horizontal cylinder

Horizontal cylinders are commonly used as settling tanks, separation vessels, and storage tanks. The LWT310 is not affected by the internal geometry of horizontal cylinders. Unlike traditional non-contact devices, which must contend with false level reflections being created by the cylinder walls, the LWT retains the signal on the probe. Furthermore, the LWT is able to measure close to the end of the probe, allowing measurement until the vessel is near empty.



Agitated vessel

Reactor vessel and mixing tanks often have agitator blades. Best practice is to use a non-contact device such as the LLT100 laser, LST300 ultrasonic or a stilling well in these applications. If these solutions are not possible, guided wave radar can be used in agitated vessels without a stilling well, but care should be taken to ensure that the probe cannot become detached or make contact with the agitator blade. Considerations should be made for attaching the probe at the bottom, lateral forces and vibration. Consult engineering for assistance in these applications.



Open sumps and lift stations

- The LWT310 works well in open sumps, lift stations, cooling tower sumps, catch basins, etc.
- Signal is unaffected by rain, turbulent surface conditions, floating debris, algae growth, or foam.
- Probe selection: Rod and coaxial probes can be used at depths comprised between 0.3 m (12 in.) and 6.1 m (20 ft.). Cable probes can be used from 0.3 m (12 in.) up to 60 m (197 ft.)

Note: Coaxial probes are best when personnel may touch the sensor probe, excessive foaming may occur, or if installation in the fill stream cannot be avoided. Rod and coaxial probes allow measurements very close to the EOP. In extremely turbulent or agitated conditions, cable probes with a heavy weight should be used. A tie-down should be considered if the probe must remain stationary.

Plastic vessels

In plastic vessels, RF waves slow down when interacting with the sides of the vessel.

LWT300-series instruments can easily compensate for this effect, providing accurate level measurement.

For RF waves to be properly guided down the probe, a conductive launch plate must be used (metal plate of flange) at the top of the vessel.

Specifications

Accuracy

2 mm (5/64 in.) or 0.03%

Resolution

1 mm (3/64 in.)

Temperature drift (digital)

±0.2 mm/10 °C (max ± 2.5 mm)

Range

Maximum: 60.00 m (197 ft.)

Minimum: 0.05 m (0.16 ft.) (with rod probe; for more details,

see accuracy diagram on next page)

Update rate

5 Hz

Temperatures

Ambient operating

-50 to 85 °C (-58 to 185 °F)1

Process

-50 to 204 °C (-58 to 400 °F)

Storage

-50 to 85 °C (-58 to 185 °F)

Process seal type vs temperature rating

- Viton (-26 to 204 °C [-15 to 400 °F])
- Kalrez (-20 to 204 °C [-4 to 400°F])
- EPDM (-50 to 120 °C [-58 to 248 °F])
- Markez (-10 to 204 °C [14 to 400 °F])

Process pressure

- -1 to 207 bar at 38 °C (-14.5 to 3,000 psi at 100 °F)
- -1 to 83 bar at 204 °C (-14.5 to 1,200 psi at 400 °F)

Dielectric constant

- 1.4 (minimum)
- DC contrast for interface measurement: >10
- Minimum top level layer thickness when measuring interface level: 50 mm (2 in.)

Process viscosity

- · Coaxial probe: 500 cp
- · Cable probe or rod probe: 10,000 cp

Power supply

- 15.5 to 42 V DC (4–20 mA functionality)
- 21 to 42 V DC (HART functionality)
- 10.5 to 28.5 V DC @ 30 mW (max.) (Modbus units)

Power consumption

- 56 mW (@ 15.5 V DC, 3.6 mA)
- 903 mW (@ 42 V DC, 21.5 mA)
- 30 mW (Modbus units)

Line resistance

950 Ω (maximum @ 36 V, 21.5 mA)

Enclosure material

Powder-coated aluminum or 316 L stainless steel

Vibration resistance

IEC 60068-2-64 IEC 60068-2-6

EMI/EMC

FCC part 15 subpart B, CISPR11 IES61000-4-3

Protection class

IP 66/68 NEMA 4X/6P

Process connections

Threaded

 $^{3}\!\!\!/4$ in. (LWT310) or 1 $^{1}\!\!\!/2$ in. (LWT320). Optional adapter bushings are available for 3- and 4-inch process connections (LWT310).

Flanged

ASME flanges: from 1 $\frac{1}{2}$ to 8 in., class 150 to 900 DN flanges: from DN 20 to DN 200, PN25 to PN160

Display

- Integrated 128 × 64 pixel liquid crystal display (LCD) with through-the-glass (TTG) interface
- Push button display (does not allow waveform display on screen for troubleshooting)

Communication protocols

- 4-20 mA analog output with HART 7 communication
- · Modbus communication
- · LevelMaster communication

Lifespan

MTBF: 76 years

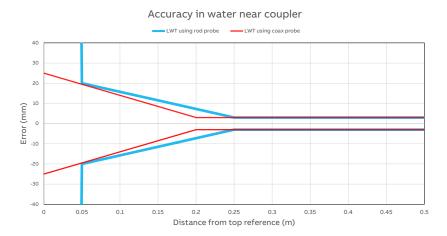
Wetted materials

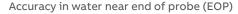
- Duplex 2205 stainless steel
- Super duplex 2507 stainless steel
- C-276 alloy
- 304L stainless steel
- 316L stainless steel

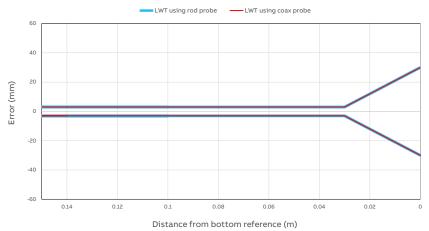
¹ See tables in FM/CSA approval certificate for limits of different protection methods

Deadband and accuracy near coupler (top) and end of probe (bottom)

Instruments from the LWT300 series can measure at distances very close to the top and bottom of the probe; however, accuracy decreases in these regions. The following plots show this reduced accuracy for different probes. Notice the short deadband for rod probes (the same applies to cables, even if not shown) and the absence of deadband for coaxial probes.

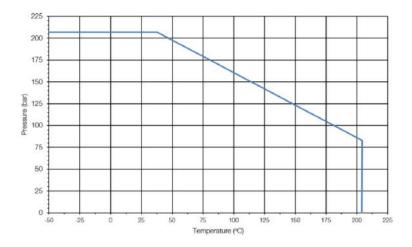






Pressure/temperature curves¹

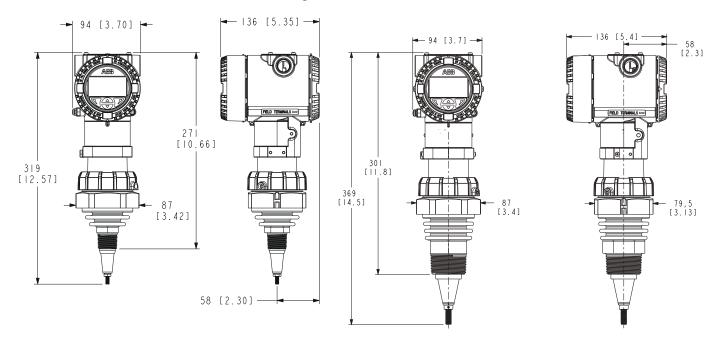
For LWT310 and LWT320.



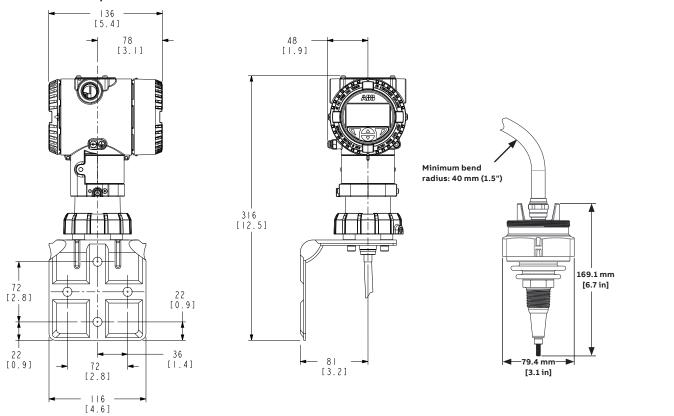
¹ Coupler temperatures are based on O-ring temperature ratings. Please refer to the O-ring chart for more information.

Dimensions (mm [in.])

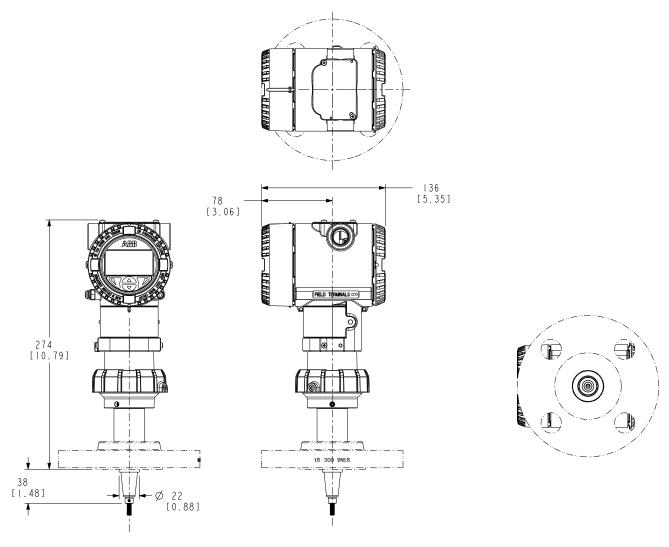
Instrument, threaded interface (LWT310 left, LWT320 right)



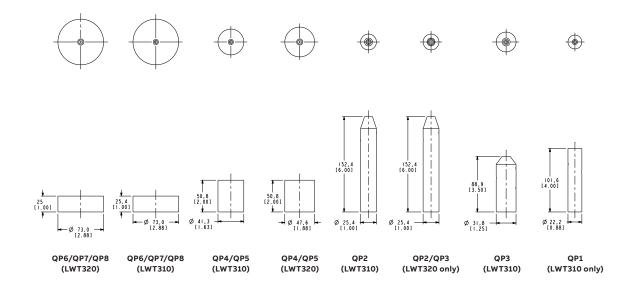
Remote head and coupler



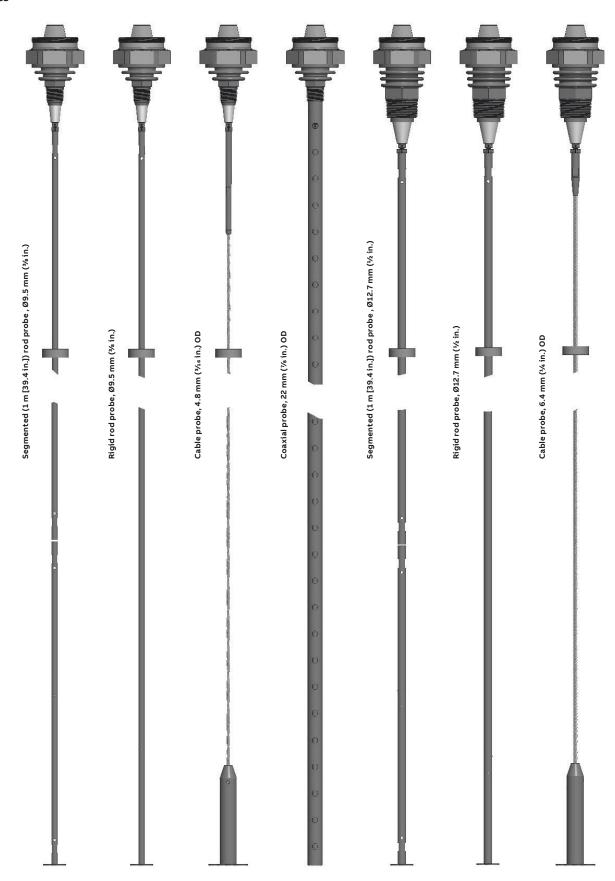
Flanged interface



Probe weight options



Probe types



Approvals

Standard body		Applied standard
CE		
	ATEX directive 2014/34/EU ("nnnn" refers to the notified body doing factory surveillance)	EN 61326-1:2013, EN/IEC 60529
	Electromagnetic Compatibility (EMC) directive 2014/30/EU	EN/IEC 61010-1:2010
	Restriction of Hazardous Substances (RoHS) directive 2011/65/EU	
	Waste of Electrical and Electronic Equipment (WEEE) 2012/19/EU	
CSA (cCSAus) (Mod	bus units only)	CSA 22.2 No.30 M1986 (R2007
	Explosion proof/dust-ignition proof with IS, SI probe (local configuration):	CSA 22.2 No.60079-11:2014 CSA 22.2 No.25-1
	Class I, II, III, Division 1, Groups C-G T6T1, T. Amb50°C to 70°C85°C	FM 3600:2018
	Explosion proof/dust-ignition proof with IS, SI connection for probe (remote configuration):	FM 3615:2018 FM 3616:2011
	Class I, II, III, Division 1, Groups C-G T6T5, T. Amb50°C to 75°C85°C	ANSI/ISA-60079-11:2009 CSA C22.2 No.60079-0:2019
	Flameproof/dust-ignition proof (local configuration):	CSA C22.2 No.60079-1:2016
	Class I, Zone 0/1 AEx/Ex ia/db IIB T6T1 Ga/Gb T. Amb50°C to 70°C85°C	CSA C22.2 No.60079-11:2014
	Zone 20/21 AEx/Ex ia/tb IIIC T77°CT358°C Da/Db	CSA C22.2 No.60079-26:2016 CSA C22.2 No.60079-31:2015
	Flameproof/dust-ignition proof (remote configuration):	ANSI/UL 60079-0:2019
	Class I, Zone 1 AEx/Ex db [ia Ga] IIB T6T5 Gb T. Amb50°C to 75°C85°C	ANSI/UL 60079-1:2019
	Zone 21 AEx/Ex tb [ia Da] IIIC T77°CT87°C Db	ANSI/ISA 60079-11:2014 ANSI/UL 60079-26:2017
Flameproof/dust-ignition proof (remote configuration):		ANSI/UL 60079-31:201
	CL I, ZONE 1, AEx/Ex db [ia Ga] IIB T6T5 Gb	CSA 22.2 No.61010-1:2012 ANSI/ISA 61010-1:2012
	ZONE 21 AEx/Ex tb [ia Da] IIIC T77°CT87°C Db	ANSI/ISA 12.27.01:201
	ZONE 21 AEx/Ex tb [ia Da] IIIC T77°CT87°C Db	ANSI/IEC 60529:2004 CSA C22.2 No. 60529:2005 (R2015
		ANSI/NEMA 250:2014
		CSA C22.2 No. 94:2011
ATEX, IECEx (HART u	units only)¹	
	ATEX: FM19ATEX0007X, IECEx FMG 19.0006X	
	Flameproof/dust proof (local configuration):	
	II 1/2 G Ex ia/db IIB T6T1 Ga/Gb -50 °C \leq Ta \leq +75 °C+85 °C	EN/IEC 60079-0, EN/IEC 60079-1
	II 1/2 D Ex ia/tb IIIC T77°CT358°C Da/Db -50 °C \leq Ta \leq +75 °C+85 °C	EN/IEC 60079-11, EN/IEC 60079-15 EN/IEC 60079-26, EN/IEC 60079-31
	Flameproof/dust proof (remote configuration):	EN/IEC 60079-20, EN/IEC 60079-31
	II (1)2 G Ex db [ia Ga] IIB T6T5 Gb -50 °C \leq Ta \leq +75 °C+85 °C	CSA C22.1:2018
	II (1)2 D Ex tb [ia Da] IIIC T77°C87°C Db -50 °C \leq Ta \leq +75 °C+85 °C	CSA C22.2 No. 25:2014 CSA 22.2 No. 30:1986 (R2012)
	Intrinsically safe (local configuration):	CSA C22.2 No. 213:2017
	II 1 G Ex ia IIC T4T1 Ga -50 °C ≤ Ta ≤ +75 °C+85 °C	CSA C22.2 No. 60079-0:2019
	II 1 D Ex ia IIIC T88°CT368°C Da -50 °C ≤ Ta ≤ +75 °C+85 °C	CSA C22.2 No. 60079-1:2011 CSA C22.2 No. 60079-11:2014
	Intrinsically safe (remote configuration):	CSA C22.2 No. 60079-15:2016
	II 1 G Ex ia IIC T6T4 Ga -50 °C ≤ Ta ≤ +75 °C+85 °C	CSA C22.2 No. 60079-31:2015 CSA C22.2 No. 61010-1:2012 (R2017)
	II 1 D Ex ia IIIC T52°CT93°C Da -50 °C ≤ Ta ≤ +75 °C+85 °C	ANSI/ISA 12.27.01:2011
	Category 3 (Zone 2) (remote configuration only):	CSA C22.2 No. 60529:2005 (R2015
	II (1)3 G Ex nAc [ia Ga] IIB T6T4 Gc -50 °C ≤ Ta ≤ +75 °C+85 °C	
	II (1)3 G Ex ic [ia Ga] IIB T6T4 Gc -50 °C ≤ Ta ≤ +75 °C+85 °C	
	II (1)3 D Ex ic [ia Da] IIIC T52°CT93°C Dc -50 °C ≤ Ta ≤ +75 °C+85 °C	

Standard body		Applied standar					
FM (cFMus) (HART units only)1							
	FM19US0023X, FM19CA0013X						
	Explosion proof/dust-ignition proof with IS, SI probe (local configuration):						
	CL I,II,III, DIV 1, GR C-G, T6T1 T. Amb50 °C to 70 °C85 °C	FM Class 3610 FM Class 3611					
	Explosion proof/dust-ignition proof with IS, SI probe (remote configuration):	FM Class 3615:2006					
	CL I,II,III, DIV 1, GR C-G, T6T5 T. Amb50 °C to 75 °C85 °C	FM Class 3616:2011					
	Flameproof/dust-ignition proof (local configuration):	FM Class 3810:2005					
		ANSI/ISA 61010- 1:2012 ANSI/ISA 60079-0:2013					
	CL I, Zone 0/1, AEx/Ex ia/db IIB T6T1 Ga/Gb T. Amb50 °C to 70 °C85 °C	ANSI/UL 60079-1:2015					
	Zone 20/21 AExEx ia/tb IIIC T77 °CT358 °C Da/Db	ANSI/ISA 60079-11					
	Flameproof/dust-ignition proof (remote configuration):	ANSI/ISA 60079-15					
	CL I, ZONE 1, AEx/Ex db [ia Ga] IIB T6T5 Gb T. Amb50 °C to 75 °C85 °C	ANSI/ISA 60079-26: 2011 ANSI/ISA 60079-31:2015					
	ZONE 21 AEx/Ex tb [ia Da] IIIC T77 °CT87 °C Db	ANSI/ISA 60079-31:201:					
	Intrinsically safe IS, SI (local configuration):	UL50					
	CL I, II, III, DIV 1, GP A-G, T4T1 T. Amb50 °C to 43 °C75 °C	ANSI/NEMA 250:2014 ANSI/IEC 60529:2004					
	CL I, ZONE 0, AEx/Ex ia IIC T4T1 Ga	CSA-C22.2 No. 0.4:201					
	Zone 20, AEx/Ex ia IIIC T88°CT368 °C Da	CSA-C22.2 No. 0.5:2017					
	Intrinsically safe IS, SI (remote configuration):	CSA-C22.2 No. 25:2014 CSA-C22.2 No. 30:2012					
	CL I, II, III, DIV 1, GP A-G T6T4 T. Amb50 °C to 40 °C85 °C	CSA-C22.2 No. 30:2017					
	CL 1, ZONE 0, AEx/Ex ia IIC T6T4 Ga	CAN/CSAC22.2 No. 60079-0:201					
	ZONE 20, AEx/Ex ia IIIC T52 °CT93 °C Da	CAN/CSAC22.2 No. 60079-1:201 CAN/CSAC22.2 No. 60079-1					
	Division 2/Zone 2/22 (remote configuration only):	CAN/CSAC22.2 No. 60079-15					
	CL I, DIV 2, Gp C, D, T6T4, with IS, SI connection for CL I, DIV 1, GROUPS C, D for remote	CAN/CSAC22.2 No. 60079-20					
	probe. Supply/HART wiring may be installed with or without non-incendive field wiring.	CAN/CSAC22.2 No. 60079-31:201 CSAC22.2 No. 60529:201					
	Class I, Zone 2, AEx/Ex ic [ia Ga] IIB T6T4 Gc	CAN/CSAC22.2 No. 61010-1:201					
	Zone 22, AEx /Ex ic [ia Da] IIIC T52 °CT93 °C Dc						
	T. Amb50 °C to 40 °C85 °C						
CRN		_					
	Canadian Registration Number (CRN) # 0F20795.5C	CAN/CSA No. B51:201 ASME B31.1/ASME B31.					
	Category "F" Type of fittings - Measuring devices	7.5.1.2 551.1/7.511.2 551.					
SIL (Safety Integrity Level)		IEC 6150					
	Certificate # TUV No. Z10 064584 0044 SIL 2/SIL 3 capable device	IEC 6150					

Ordering information

	Main code										Optio		
LWT310/LWT320	ХХ	XX	XX	XXX	Х	хх	XXXX	XX	XX	XX	XXX		
pprovals													
General purpose	Y0												
ATEX/IECEx Intrinsically safe, Ex ia IIC Ga, Ex ia IIIC Da	E1												
ATEX/IECEx Flameproof/dustproof housing, Ex db/ia, Ex ta ia	E2												
ATEX/IECEx Non-sparking, Ex nAc/ia, Category 3/1 (remote probe only)	E3												
ATEX/IECEx	E9												
Ex ic/ia, Category 3/1 (remote probe only)													
Combination Approval - US standards FMus, ATEX, IECEx - Flameproof/explosion proof, intrinsically safe, dustproof (protection type to be marked by customer)	M1												
Combination Approval - Canadian standards cFM, ATEX, IECEx - Flameproof/explosion proof, intrinsically safe, dustproof (protection type to be marked by customer) (also meeting FMus)	M2												
cFMus standards, intrinsically safe, Ex ia	N1												
FM US standards, explosion proof/flameproof/dustproof, Ex db/ia, Ex ta ia	N2												
cFMus standards, Non-incendive with intrinsically safe probe & Ex nAc/ia (remote probe only)	N3												
Canadian standards by FM Explosion proof/flameproof/dustproof Ex db/ia, Ex ta ia (also meeting FMus)	N4												
US standards by CSA (for Modbus communication only) Explosion proof/flameproof/dustproof	N5												
Ex db/ia, Ex tb ia cFMus standards, Ex ic / ia (category 3/1) (remote probe only)	N6												
Canadian standards by CSA (for Modbus communication only)	INO												
Explosion proof/flameproof/dustproof Ex db/ia, Ex tb ia (also meeting CSAus)	N7												
/etted material													
C-276 alloy		H1											
304L stainless steel		S4											
316L stainless steel		S 6											
eal type (O-ring)													
Viton, process service temperature range: -26 to 204 °C (-15 to 400 °F)			VO										
Kalrez, process service temperature range: -20 to 204 °C (-4 to 400 °F)			K0										
EPDM, process service temperature range: -50 to 120 °C (-58 to 248 °F)			EO										
Markez, process service temperature range: $-10 \text{ to } 204 ^{\circ}\text{C} (14 \text{ to } 400 ^{\circ}\text{F})$			М0										
rocess connection type and pressure rating													
ANSI/ASME, raised face Class 150				ARD									
ANSI/ASME, raised face Class 300				ARE									
ANSI/ASME, raised face Class 600				ARG									
ANSI/ASME, raised face Class 900				ARH									
DIN, raised face PN25				DRD									
DIN, raised face PN40				DRE									
DIN, raised face PN100				DRG									
DIN, raised face PN160				DRH									
NPT threaded connection				NTN									
Special (industry-recognized standard flanges only)				ZZZ									

				Main c	ode							Option code
	LWT310/LWT320	хх	ХХ	XX	XXX	X	XX	XXXX	XX	XX	XX	XXX
Process connection size												
DN 20/ANSI 3/4 in. (LWT310 only)						В						
DN 25/ANSI 1 in. (LWT310 only)						С						
DN 40/ANSI 1 ½ in.						Ε						
DN 50/ANSI 2 in.						F						
DN 80/ANSI 3 in.						Н						
DN 100/ANSI 4 in.						J						
DN 150/ANSI 6 in.						М						
DN 200/ANSI 8 in.						Р						
Special (industry recognized standard flanges only	')					Z						
Probe type												
LWT310 rod probes												
Rod probe							R2					
Ø9.5 mm (¾ in.), 6.1 m (20 ft.) maximum length							KΔ					
Segmented rod probe (1 m [39.4 in.]) Ø9.5 mm (¾ in.), 6.1 m (20 ft.) maximum length							R5					
LWT320 rod probes												
Rod probe Ø12.7 mm (½ in.), 6.1 m (20 ft.) maximum length							R3					
Segmented rod probe (1 m [39.4 in.]), Ø12.7 mm ($\frac{1}{2}$ in.), 6.1 m (20 ft.) maximum length							R6					
LWT310 cable probes												
Cable probe 4.8 mm (¾ 6 in.) O.D. 61 m (200 ft.) maximum length							F1					
Cable probe 4.8 mm (¾ in.) O.D., with Teflon spacers 61 m (200 ft.) maximum length							FB					
LWT320 cable probes												
Cable probe 6.4 mm (¼ in.) O.D. 61 m (200 ft.) maximum length							F2					
LWT310 coaxial probes												
Coaxial probe 22 mm (⅓ in.) O.D. with Teflon spacers							СТ					
6.7 m (22 ft.) maximum length							СТ					
Probe material												
C-276 alloy								PMH1				
304/L stainless steel								PMS4				
316/L stainless steel								PMS6				
Housing												
									D.1			
Aluminum with 2 × M20 × 1.5									D1			
Aluminum with 2 × NPT ½ in.									D2			
316L stainless steel with 2 × M20 × 1.5									D3			
316L stainless steel with 2 × NPT ½ in.									D4			
Remote/Aluminum 2 × M20 × 1.5									R1			
Remote/Aluminum 2 × NPT ½ in.									R2			
Remote/Stainless steel 2 × M20 × 1.5									R3			
Remote/Stainless steel 2 × NPT ½ in.									R4			
Display												
No display, with blind cover										LO		
With HMI TTG and display and glass cover										L2		
Output												
Single 4 to 20 mA + HART communication											H1	
Modbus and LevelMaster communication											M1	-

Jamounted accessories	LWT310/LWT320	Main code									
		хх	хх	XX	XXX	Х	ХХ	XXXX	XX	XX	XX
Stanning plug nickel-plated brass											
Stopping plug, nickel-plated brass											
Cable gland, nickel-plated brass											
3 in. to ³ / ₄ in. bushing (Class 150)											
4 in. to 3/4 in. bushing (Class 150)											
Other accessory											
emote electronics coaxial cable length (for remot 1.5 m (≅5 ft.)	te coupler only)										
3 m (≅10 ft.)											
5 m (≅16 ft.)											
6 m (≅20 ft.)											
10 m (≅32 ft.)											
15 m (≅49 ft.)											
20 m (≅66 ft.)											
25 m (≅82 ft.)											
30 m (≅98 ft.)											
35 m (≅115 ft.)											
40 m (≅131 ft.)											
45 m (≅147 ft.)											
50 m (≅164 ft.)											
60 m (≅197 ft.)											
Custom coaxial remote length (max. 60 m [197 ft.])											
Cable weight (removable) Cable weight (welded, LWT320 only)											
Centering disks											
Metal centering disk											
evice identification plate											
Additional stainless-steel hang tag											
Additional screwed-on steel tag plate											
ertificates											
Test report 2.2 acc. EN 10204		1000:									
MTR 3.1, Material monitoring with inspection ce		10204									
Declaration of compliance with the order 2.1 acc											
With dye penetrant test on pressure bearing par	τs										
Certificate of origin											
Attested certificate of origin											
Printed record of configured settings in transmi	tter										
With hydrostatic test report											
With hydrostatic test report PMI Positive Material Identification without carb	ith inspection certifi	cate									
PMI Positive Material Identification without carb Material monitoring NACE MR 0175, MR 0103 wi											
PMI Positive Material Identification without carb Material monitoring NACE MR 0175, MR 0103 wi 3.1 acc. EN 10204 SIL2 - certified acc. to IEC61508											
PMI Positive Material Identification without carb Material monitoring NACE MR 0175, MR 0103 wi 3.1 acc. EN 10204 SIL2 - certified acc. to IEC61508	nstruction										
PMI Positive Material Identification without carb Material monitoring NACE MR 0175, MR 0103 wi 3.1 acc. EN 10204 SIL2 - certified acc. to IEC61508 rawings Standard ABB drawings for approval prior to con	nstruction										
PMI Positive Material Identification without carb Material monitoring NACE MR 0175, MR 0103 wi 3.1 acc. EN 10204 SIL2 - certified acc. to IEC61508	nstruction										

	Main code										Optiona	
	LWT310/LWT320	XX	XX	ХХ	XXX	Х	XX	XXXX	ХХ	XX	XX	XXX
ocumentation language (user and safety guid	es, hard copy)											
German												M1
French												M4
English												M5
rogramming and parameter settings												
Custom parameter settings												N6
alibration type 5-point calibration verification certificate, fa longer distance guaranteed verified by desig	•	0, 25 a	nd 0% (of mea	suremer	nt leng	gth (ma	aximum ler	ngth of 7	m, poir	nts at	R5
9-point calibration verification certificate, fa longer distance guaranteed verified by desig	ctory default 100, 87.5,	75, 67	.5, 50, 3	37.5, 25	, 12.5 a	nd 0%	(maxi	mum lengt	th of 7 m	, points	at	R9
ipe or chamber internal diameter for spacer, w Inner diameter ≥24.3 mm (0.96 in.) and <34 r	•		-).88 in.)	(LWT3	10 on	ly)					QP1
Inner diameter ≥34 mm (1.34 in.) and <42.8 r	mm (1.69 in.)											QP2
Inner diameter ≥42.8 mm (1.69 in.) and <54 r												QP3
Inner diameter ≥54 mm (2.13 in.) and <66.7 r	<u> </u>											QP4
Inner diameter ≥66.7 mm (2.62 in.) and <82.8												QP5
Inner diameter ≥82.8 mm (3.26 in.) and <102 measurement	.3 mm (4.03 in.) – Low p	orofile	for inte	rface								QP6
Inner diameter ≥102.3 mm (4.03 in.) and <12 measurement	2.3 mm (4.81 in.) – Low	profile	e for int	erface								QP7
Inner diameter ≥122.3 mm (4.81 in.)												QP8
Custom dimension (not for gas phase compe	ensation)											QPZ
												_
robe length UOM (this code will not appear on mm	label – only the length	+ unit	s)									QL3





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