

2-wire System Level Radar

TLR7500

80GHz Microwave level meter

OUTLINE

The **TLR7500** is a non-contact type continuous level meter using microwaves. This meter determines the level of a measured object by emitting microwaves and measuring the time taken for the microwaves to travel out, be reflected and return from the object.

Since the velocity of electromagnetic waves is hardly affected by temperature and pressure, meters of this type can accurately measure levels under any conditions. Measurements are also independent of the viscosity, or changes in the density and temperature of measured objects, allowing such meters to be used for a wide range of temperatures and pressures.

Using a newly developed lens antenna, the **TLR7500** can be mounted on small-diameter nozzles, and is ideal for level measurement of 80-GHz high directivity as well as ultra-small containers.

Inheriting the features of existing microwave level meters, the **TLR7500** is even easier to use.



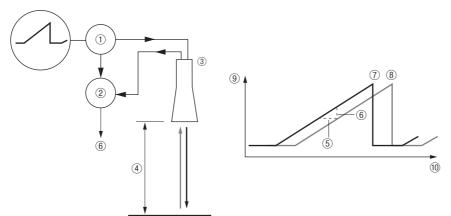


FEATURES

- ☐ Non-contact, continuous level measurement with high accuracy
- ☐ Measuring various objects such as liquids and slurries
- ☐ Displaying and outputting measurements of level, distance, volume, and mass
- ☐ High-accuracy level measurement independent of changes in temperature, pressure, or density
- ☐ Up to 4 MPa operating pressure range from vacuum
- ☐ Wide operating temperature range from -50°C to 150°C
- ☐ Minimum-size DN20 (¾") antenna mountable on small-diameter nozzles
- ☐ Easy mounting on top of tanks, no need to worry about leakage
- ☐ Suitable for various installation environments with high directivity
- ☐ Compact housing design for mounting in narrow spaces
- ☐ Can start measuring immediately after mounting with simple parameter setting
- ☐ Range setting by numerical values, no need to adjust the range for the fluctuation of actual liquid
- □ Easy to input parameters
- ☐ Maintenance-free with no moving parts

MEASUREMENT PRINCIPLE

Microwaves, whose frequency linearly changes in the main body, are continuously emitted from the antenna. The microwaves are reflected by the measured object and return to the antenna. Based on the frequency of the returned microwaves, the return time can be calculated. Since the propagation speed of microwaves is constant, the return time is used to calculate the distance to the measured object. The calculated distance can be displayed (output) as a level, based on the preset tank data.



- 1 Emitted microwaves
- ② Received microwaves
- 3 Antenna
- 4 Distance
- 5 Time difference
- 6 Frequency difference
- (7) Emitted microwaves
- ® Received microwaves
- 9 Frequency
- 10 Time

STANDARD SPECIFICATIONS

	Item	Description
	Object	Liquids, pastes, and slurries
	Method	Frequency modulated continuous wave (FMCW)
	Frequency	78 to 82 GHz (W band)
Measurement	Output	Level, distance, volume, and mass
Widadardirioni	Range	Max. 50 m (depends on the dielectric constant of the measured objects and antenna type)
	Minimum output range	0.2 m
	Minimum dead zone	Antenna length + antenna extension length + 0.1 m (depends on the measuring conditions)
	Output	4 to 20 mA DC (HART)
	Accuracy	±0.01 mA (at 20°C) (Output accuracy is added to the accuracy of the display value)
	Resolution	±5µA
Output	Temperature drift	50 ppm/K (typical)
Output	Error signal	21.5 mA DC, 3.5 mA DC (selectable by parameter)
	Lifor signal	R $[\Omega] \le (\text{Supply voltage} - 12 \text{ V})/21.5 \text{ mA} (\text{Standard type/Ex i})$
	Load resistance (max.)	$R [\Omega] \le (Supply \ voltage - 16 \ V)/21.5 \ mA (Standard \ type/LX \ type/L$
		±3 mm R. D. (less than 10 m), ±0.03%/R. D. (10 m or more)
		Temperature: 15°C to 25°C
		Pressure: 0.1 MPa ±5 kPa
Accuracy	Standard conditions	Humidity: 60% ±15%
ricodracy		Target: Metal plate
	Resolution	1mm
	Repeatability	±1mm
	Temperature of process	−50 to +150°C
	connection	The operating temperature range depends on the seal materials. Refer to ANTENNA SPECIFICATIONS
Measuring	Operating pressure	0 kPa (abs) to 4.0 MPa, 0 kPa (abs) to 1.6 MPa [PTFE lens antenna]
conditions	Dielectric constant	1.4 or more: Direct mode (depends on the measuring conditions and antenna type)
	Dielectric constant	1.1 or more: TBF mode *1
	Change rate (max.)	60 m/min (depends on the measuring conditions)
	Ambient temperature	-40 to +80°C (For explosionproof type, refer to EXPLOSIONPROOF SPECIFICATIONS)
	Relative humidity	0 to 99% (no condensation)
	Storage temperature	-40 to +85°C
	Durata ati an alama	IP66/IP68 [IEC60529]
	Protection class	NEMA250: NEMA type 6, 6P (housing), type 6P (antenna)
		JPN Ex explosionproof
		Ex ia IIC T6T3 Ga/Gb
		Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db
Instrument		Ex db ia IIC T6T3 Ga/Gb
specifications		Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db
specifications		ATEX explosionproof
	Explosionproof	II 1/2 G Ex ia IIC T6T3 Ga/Gb II 1/2 D Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db
	Explosioriproof	II 1/2 G Ex da iiiC 165 G130 G 01 165 G1200 G Da/Db
		II 1/2 D Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db
		IECEx explosionproof
		Ex ia IIC T6T3 Ga/Gb
		Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db
		Ex db ia IIC T6T3 Ga/Gb
		EX ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db
	Туре	2-wire loop-powered system
	Power supply	Rated voltage: 24 V DC
Electrical	,	Voltage range: 16 to 36 V DC (Ex d), 12 to 30 V DC (Standard type, Ex i) *2
connection	Cable entry	M20 × 1.5
	Terminal	0.5 to 2.5 mm ²
	Cable outer diameter	7 to 12 mm
	Housing	Aluminum (polyester coating)
	Process connection	Stainless steel (SS316L)
Material	Antenna	PEEK, PTFE, stainless steel (SS316L)
atoriai	Seal	FKM / FPM, Kalrez® 6375, EPDM
	Weather protection	Stainless steel (SS316L)
		Stainless steel (SS316L)
	Weather protection (Accessory)	Stainless steel (SS316L) LCD with backlight, 128 \times 64 pixels in 64-step gray scale
	Weather protection	
Display	Weather protection (Accessory)	LCD with backlight, 128 × 64 pixels in 64-step gray scale
Display	Weather protection (Accessory) Display panel	LCD with backlight, 128 × 64 pixels in 64-step gray scale Language: English or Japanese 4 key buttons (Right, Enter, Up and Down)
Display	Weather protection (Accessory) Display panel Control unit	LCD with backlight, 128 × 64 pixels in 64-step gray scale Language: English or Japanese 4 key buttons (Right, Enter, Up and Down) -20 to +70°C
	Weather protection (Accessory) Display panel Control unit Operating ambient	LCD with backlight, 128 × 64 pixels in 64-step gray scale Language: English or Japanese 4 key buttons (Right, Enter, Up and Down)
Display Process connection	Weather protection (Accessory) Display panel Control unit Operating ambient temperature	LCD with backlight, 128 × 64 pixels in 64-step gray scale Language: English or Japanese 4 key buttons (Right, Enter, Up and Down) -20 to +70°C

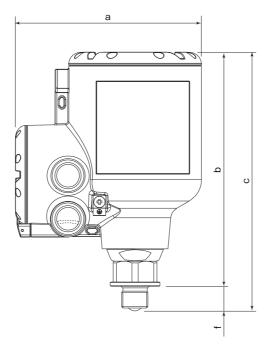
^{*1:} The dielectric constant of measured objects may not be measured depending on the measuring conditions. *2: Voltage supply required to output 21.5 mA

ANTENNA SPECIFICATIONS

		Description	
	DN20 (%") lens antenna		
Antenna type	DN25 (1") lens antenna		
Antenna type	DN40 (11/2") lens antenna		
	DN70 (2¾") lens antenna		
	Max. 5 m: DN20 (¾") lens antenna		
Measuring range	Max. 10 m: DN25 (1") lens antenna		
ivieasuring range	Max. 25 m: DN40 (11/2") lens antenr	na	
	Max. 50 m: DN70 (2¾") lens anteni	na	
	DN20 (¾") lens antenna: 15 degree	es	
Beam angle	DN25 (1") lens antenna: 10 degrees		
Deam angle	DN40 (1½") lens antenna: 8 degrees		
	DN70 (2¾") lens antenna: 4 degrees		
Operating	−40 to +150°C (Seal material: FKM/FPM)		
Operating temperature	-20 to +150°C (Seal material: Kalrez® 6375)		
temperature	-50 to +150°C (Seal material: EPDI	M)	
Operating pressure	0 kPa (abs) to 4.0 MPa, 0 kPa (abs)	to 1.6 MPa [PTFE lens antenna]	
	DN20 (¾") lens antenna	G¾", ¾NPT male thread	
	DN25 (1") lens antenna	G1", 1NPT male thread	
Process	DN40 (1½") lens antenna	G1½", 1½NPT male thread	
connection	DIV40 (172) letts afficilità	JIS10K 50A, 80A, ASME 2", 3" 150 lbs, 300 lbs, flange	
	DN70 (2¾") lens antenna	G3", 3NPT male thread	
	DINTO (274) letts attletitla	JIS10K 80A, 100A, 150A, 200A, ASME 3", 4", 6", 8" 150 lbs, 300 lbs, flange	

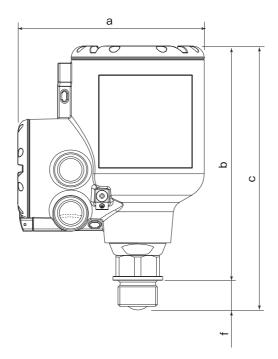
EXTERNAL DIMENSIONS

DN20 lens antenna



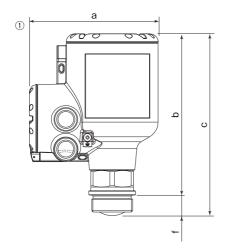
Process		Dimensio	ons [mm]	
connection	а	b	С	f
34" thread	151	190	213	23

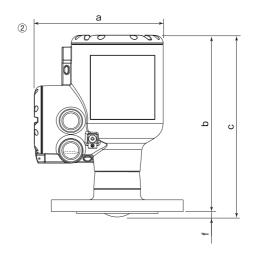
DN25 lens antenna



Process	Process Dimensions [mm]				
connection	а	b	С	f	
1" thread	151	191	215	24	

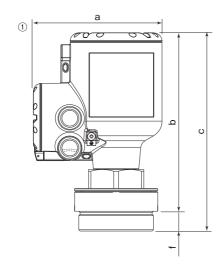
DN40 lens antenna

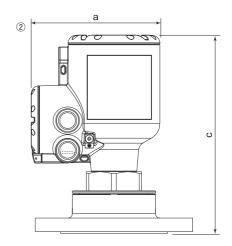




Process	Dimensions [mm]				
connection	а	b	С	f	
① 11/2" thread	151	190.5	215	24.5	
② Flange	151	210.5	215	4.5	

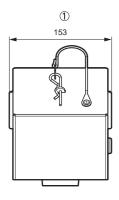
DN70 lens antenna

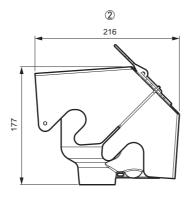




Process	Dimensions [mm]			
connection	а	b	С	f
① 3" thread	151	210	233	23
② Flange	151	_	233	_

Weather protection (Accessory)







- Front
 Left side
 Back

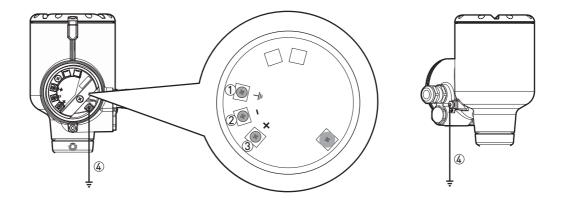
MASS

6

Part name		Specification	Mass [kg]	
Housing		Aluminum	2.1	
		11/2" thread	2.6	
	DN40 lens antenna	DN80 /3" flange	6.7	
Antenna		DN80 /3" flange with antenna extension	7.8	
	DNZO long entenne	3" thread	4.3	
DN70 lens antenna		DN80 /3" flange	7.0	
Accessory				
Weather protection		Stainless steel	1.3	

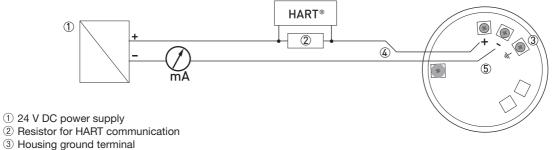
WIRING

Terminals



- ① Housing ground terminal (connected when the signal line is a shielded cable)
- ② Signal (power supply) cable (–)
- 3 Signal (power supply) cable (+)
- 4 Ground terminal (underneath the converter housing)

Wire connection



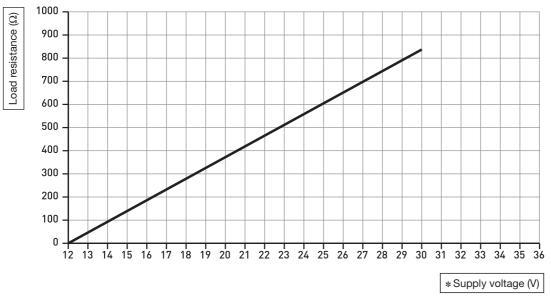
- Signal line
- (5) Housing wire connection board
- \bullet Use stranded cable of 0.5 to 2.5 mm^2 cross section for a signal (power supply) line.
- Avoid laying a signal (power supply) line close to a power cable.
- Use a different power supply for the TLR7500 from those for other power instruments.
- It is recommended to use a shielded cable.
- A single-point ground with a shielded cable is recommended.

POWER SUPPLY

The graphs below show the minimum voltage required across a resistor in the loop.

Non-explosion products and intrinsically safe products

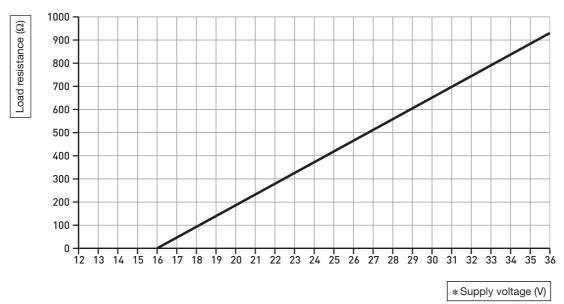
Supply voltage: 12 V to 30 V DC



*: The minimum voltage required to output 21.5 mA at the device terminal

Flameproof products

Supply voltage: 16 V to 36 V DC



*: The minimum voltage required to output 21.5 mA at the device terminal

EXPLOSIONPROOF SPECIFICATIONS

JPN Ex

Certificate number: CML 19JPN2030X

Ex ia IIC T6...T3 Ga/Gb

Ex ia IIIC T85°C...T150°C or T85°C...T200°C Da/Db

Ex db ia IIC T6...T3 Ga/Gb

Ex ia tb IIIC T85°C...T150°C or T85°C...T200°C Da/Db

Without distance piece

Townseature class	Tomporature class May surface temporature		emperature [°C]	May proceed temperature [°C]
Temperature class	Max. surface temperature	Aluminum housing	Stainless steel housing	Max. process temperature [°C]
TG	T6 T85°C	+60	+60	+60
10		+48	+43	+85
T5	T100°C	+75 [+70] *2	+75 [+68] *2	+75
15	15	+63	+58	+100
T4	T105°O	+64	+56 [+52] *2	+115
T4 T135°C	+55	+43	+135	
T3	T150°C	+49	+33	+150

	Temperature class Max. surface temperature —		Min. ambient temperature [°C]		Min. process temperature [°C]]
			Aluminum housing	Stainless steel housing	wiiii. process temperature [C]	
	All *1	All *1	-40	-40	-40	1
	All	All	-35	-33	-50	1

^{*1:} The minimum process temperature of seal material: -20°C for Kalrez 6375, and -40°C for FKM/FPM

With distance piece

Temperature class	Max. surface temperature	Max. ambient temperature [°C]		Max. process temperature [°C]
Terriperature class	Max. Surface temperature	Aluminum housing	Stainless steel housing	Max. process temperature [C]
TG	T85°C	+60	+60	+60
10	T6 T85°C	+53	+51	+85
T5	T100°C	+75 [+70] *2	+75 [+69] *2	+75
15	1100 C	+68	+66 [+64] *2	+100
T4	T135°C	+70	+68 [+61] *2	+115
14	1135 C	+65	+61 [+58] *2	+135
		+61	+56 [+55] *2	+150
T3 *1 T200°C *1	+53	+46	+180	
		+48	+40	+200

^{*1}: The maximum process temperature of seal material: $+150^{\circ}\text{C}$ for EPDM

^{*2:} Values in parentheses are for Ex db ia- or Ex ia tb- approved device.

Temperature class	emperature class Max. surface temperature		emperature [°C]	Min. process temperature [°C]
remperature ciass	Max. Surface temperature	Aluminum housing Sta	Stainless steel housing	wiiii. process temperature [C]
All *3	All *3 All *3	-40	-40	-40
All	All	-37	-36	-50

^{*3:} Minimum process temperature of seal material: -20°C for Kalrez 6375, and -40°C for FKM/FPM

When using the TLR7500 as an intrinsically safe device, circuit variables must not exceed the following values. Ui=30 V dc, Ii=130 mA, Pi=1 W, Ci=10 nF, Li=0 μ H

When using the TLR7500 as a flameproof device, the ratings below must be observed. U=16 to 36 V DC, 4 to 20 mA (passive, HART) Um=250 V AC 50/60Hz, 250 V DC

^{*2:} Values in parentheses are for Ex db ia- or Ex ia tb- approved device.

ATEX

Certification No. KIWA 19ATEX0015X

II 1/2 G Ex ia IIC T6...T3 Ga/Gb

II 1/2 D Ex ia IIIC T85°C...T150°C or T85°C...T200°C Da/Db

II 1/2 G Ex db ia IIC T6...T3 Ga/Gb

II 1/2 D Ex ia tb IIIC T85°C...T150°C or T85°C...T200°C Da/Db

Without distance piece

EPL Ga/Gb	EPL Da/Db	Max. ambient temperature [°C]		Max. process temperature [°C]
Temperature class	Temperature class Max. surface temperature		Stainless steel housing	wax. process temperature [C]
T6	T85°C	+60	+60	+60
10	185-0	+48	+43	+85
T5	T100°C	+75 [+70] *2	+75 [+68] *2	+75
15	1100-C	+63	+58	+100
T4	T135°C	+64	+56 [+52] *2	+115
14	+55	+43	+135	
T3	T150°C	+49	+33	+150

EPL Ga/Gb	EPL Da/Db	Min. ambient to	emperature [°C]	Min. process temperature [°C]
Temperature class	Max. surface temperature	Aluminum housing	Stainless steel housing	Min. process temperature [C]
All *1	All *1	-40	-40	-40
All	All	-35	-33	-50

^{*1:} The minimum process temperature of seal material: -20°C for Kalrez 6375, and -40°C for FKM/FPM

With distance piece

10

EPL Ga/Gb	EPL Da/Db	Max. ambient t	May proceed to manage true [90]	
Temperature class	Max. surface temperature	Aluminum housing	Stainless steel housing	Max. process temperature [°C]
T6	T85°C -	+60	+60	+60
10	165 C	+53	+51	+85
T5	T100°C	+75 [+70] *2	+75 [+69] *2	+75
15	1100 C	+68	+66 [+64] *2	+100
T4	T135°C	+70	+68 [+61] *2	+115
14	1135 C	+65	+61 [+58] *2	+135
		+61	+56 [+55] *2	+150
T3 *1	T200°C *1	+53	+46	+180
		+48	+40	+200

^{*1:} The maximum process temperature of seal material: +150°C for EPDM

^{*2:} Values in parentheses are for Ex db ia- or Ex ia tb- approved device.

EPL Ga/Gb	EPL Da/Db	Min. ambient te	emperature [°C]	Min. process temperature [°C]	
Temperature class	Max. surface temperature	Aluminum housing	Stainless steel housing	wiiii. process temperature [C]	
All *3	All *3	-40	-40	-40	
All	All	-37	-36	-50	

^{*3:} Minimum process temperature of seal material: -20°C for Kalrez 6375, and -40°C for FKM/FPM

When using the TLR7500 as an intrinsically safe device, circuit variables must not exceed the following values. Ui=30 V dc, Ii=130 mA, Pi=1 W, Ci=10 nF, Li=0 μ H

When using the TLR7500 as a flameproof device, the ratings below must be observed. U_N =36 Vdc, I_N =22 mA, Um=250 V ac

^{*2:} Values in parentheses are for Ex db ia- or Ex ia tb- approved device.

IECEx

Certification No. IECEx KIWA 19.0009X

Ex ia IIC T6...T3 Ga/Gb

Ex ia IIIC T85°C...T150°C or T85°C...T200°C Da/Db

Ex db ia IIC T6...T3 Ga/Gb

Ex ia tb IIIC T85°C...T150°C or T85°C...T200°C Da/Db

Without distance piece

EPL Ga/Gb	EPL Da/Db	Max. ambient to	emperature [°C]	May proceed temperature [°C]
Temperature class	Max. surface temperature	Aluminum housing	Stainless steel housing	iviax. process temperature [C]
T6	T85°C	+60	+60	+60
10	165 C	+48	+43	+85
T5	T100°C	+75 [+70] *2	+75 [+68] *2	+75
15	1100 C	+63	+58	+100
T4	T135°C	+64	+56 [+52] *2	+115
14	1135 C	+55	+43	+85 +75 +100
T3	T150°C	+49	+33	+150

EPL Ga/Gb	EPL Da/Db	Min. ambient to	emperature [°C]	Min. process temperature [°C]
Temperature class	Max. surface temperature	Aluminum housing	Stainless steel housing	win. process temperature [C]
All *1	All *1	-40	-40	-40
All	All	-35	-33	-50

^{*1:} The minimum process temperature of seal material: -20°C for Kalrez 6375, and -40°C for FKM/FPM

With distance piece

EPL Ga/Gb	EPL Da/Db	Max. ambient t	emperature [°C]	Max. process temperature [°C]
Temperature class	Max. surface temperature	Aluminum housing	Stainless steel housing	wax. process temperature [C]
Т6	T85°C	+60	+60	+60
10	165 C	+53	+51	+85
T5	T100°C	+75 [+70] *2	+75 [+69] *2	+75
15	1100 C	+68	+66 [+64] *2	+100
T4	T135°C	+70	+68 [+61] *2	+115
14	1135 C	+65	+61 [+58] *2	+135
		+61	+56 [+55] *2	+150
T3 *1	T200°C *1	+53	+46	+180
		+48	+40	+200

^{*1:} The maximum process temperature of seal material: +150°C for EPDM or PTFE drop antenna

^{*2:} Values in parentheses are for Ex db ia- or Ex ia tb- approved device.

	EPL Ga/Gb	EPL Da/Db	Min. ambient te	emperature [°C]	Min. process temperature [°C]
	Temperature class	Max. surface temperature	Aluminum housing	Stainless steel housing	wiii. process temperature [C]
ĺ	All *3	All *3	-40	-40	-40
	All	All	-37	-36	-50

^{*3:} Minimum process temperature of seal material: -20°C for Kalrez 6375, and -40°C for FKM/FPM

When using the TLR7500 as an intrinsically safe device, circuit variables must not exceed the following values. Ui=30 V dc, Ii=130 mA, Pi=1 W, Ci=10 nF, Li=0 μ H

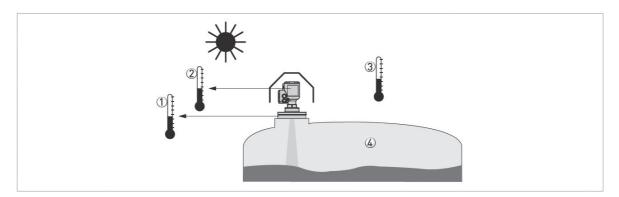
When using the TLR7500 as a flame proof device, the ratings below must be observed. $U_n=36$ V dc, $I_n=22$ mA, Um=250 V ac

^{*2:} Values in parentheses are for Ex db ia- or Ex ia tb- approved device.

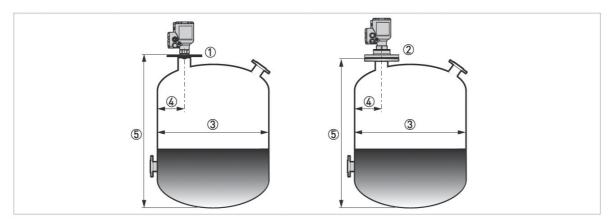
NOTES ON USE

Mounting location

- Avoid direct sunshine. Use a sunshade or weather protection to keep the TLR7500 within the operating temperature range. In particular, do not expose the LCD indicator to direct sunshine. The ambient temperature must be between -40°C and +80°C.
- Do not mount the TLR7500 at a place subject to strong vibration.
- The TLR7500 has a dead zone near the sensor in which the TLR7500 cannot measure the level. This may cause difficulties. Consider the range (vertical length) of this zone when mounting the TLR7500.

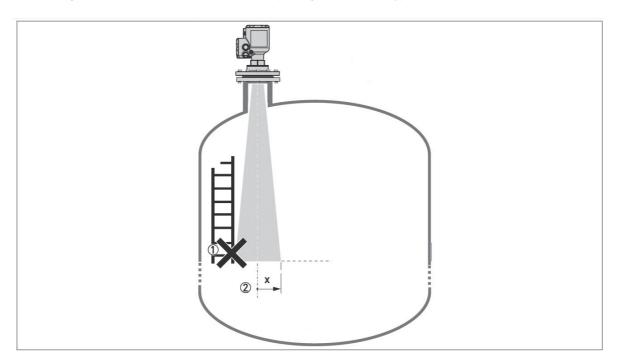


- ① The allowable temperature range of the process connection varies depending on the seal material.
- 2) The temperature of the indicator must be between -20°C and +70°C.
- 3 The ambient temperature must be between -40°C and +80°C. Refer to EXPLOSIONPROOF SPECIFICATIONS for explosionproof types.
- 4) Use the TLR7500 within the specified pressure range.
- When the TLR7500 is mounted in the center of a circular tank with a diameter of 1 m or less, multiple reflections interfere with the measurement. Install it away from the center of the tank.
 - When installing in the four corners of a non-cylindrical vessel such as a concrete pit, install it in a position where the distances to the two adjacent walls are not equal.
- Recommended mounting locations and distances from the vessel wall are shown below.
 In any case, the TLR7500 must be at least 200 mm off the tank wall.
- Ensure that walls within the emission range of microwaves are smooth.



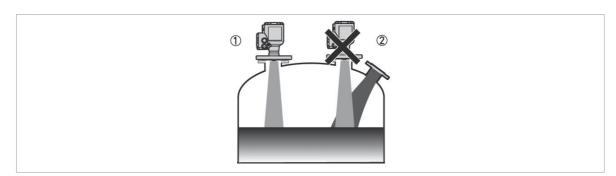
- (1) Mounting location for DN20 and DN25 lens antennas
- ② Mounting location for DN40 and DN70 lens antennas
- (3) Inner diameter of the vessel
- (4) Recommended minimum distance between the mounting location and the vessel wall for each antenna type
 - \bullet DN20 and DN25 lens antennas: Vessel height \times 1/5 (in the case of a 5 m high vessel: 5 m \times 1/5 = 1 m)
 - DN40 lens antenna: Vessel height \times 1/10 (in the case of a 5 m high vessel: 5 m \times 1/10 = 0.5 m)
 - DN70 lens antenna: Vessel height \times 1/20 (in the case of a 5 m high vessel: 5 m \times 1/20 = 0.25 m) Recommended minimum distance between the mounting location and the vessel wall: diameter of the vessel \times 1/3
- (5) Height of the vessel

- \bullet Ensure that there are no obstacles within the emission range of microwaves.
- ①Obstacles include agitators, ladders, reinforcements, and heating coils.
- ②The emission range of microwaves for measurement varies depending on the antenna type. Refer to the table below.



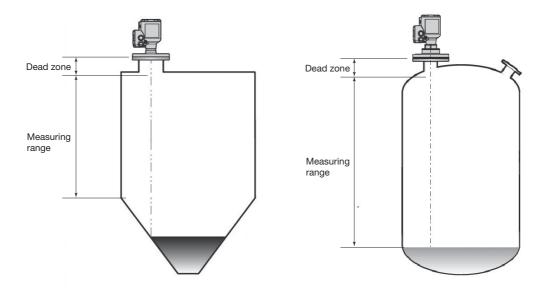
Antonno tuno	Beam angle	Beam range (x)
Antenna type	beam angle	mm/m
DN20 [¾"] lens antenna	15°	132
DN25 [1"] lens antenna	10°	87
DN40 [1½"] lens antenna	8°	70
DN70 [2¾"] lens antenna	4°	35

Avoid a mounting position where any inflow of product enters the emission range of microwaves.
 Take appropriate measures such as changing the mounting location or the product loading method.

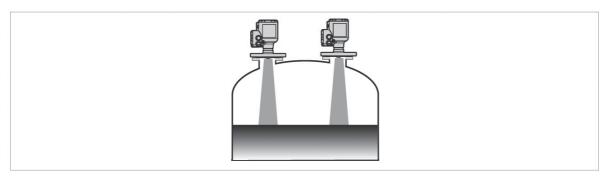


- ① Correct mounting position
- 2 Inflow of product may disturb measurement.

• For tanks whose bottom is not flat but dish- or cone-shaped, the measuring range is from the lower end of the dead zone to the lower end of the cylindrical part of the tank. It is not possible to measure the level precisely below the cylindrical part.

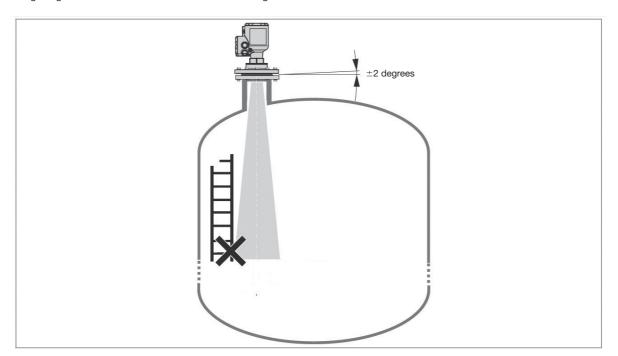


• Multiple TLR7500 units can be mounted on the same vessel. In this case, however, mount them as far as possible from each other.



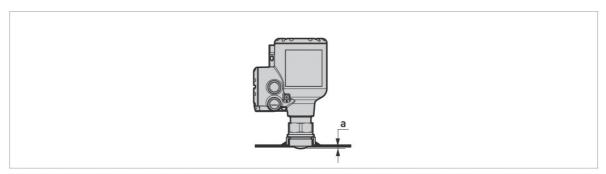
Mounting method

The mounting flange face should not be tilted more than ±2 degrees.



Thread mounting

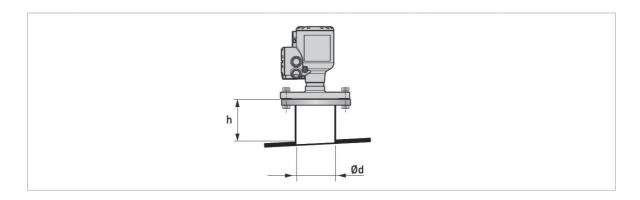
• Weld a half coupling on the vessel roof. Do not screw in the thread with an excessive torque.



Dimension a: 6mm for DN20, DN25, and DN40 lens antennas

Flange mounting

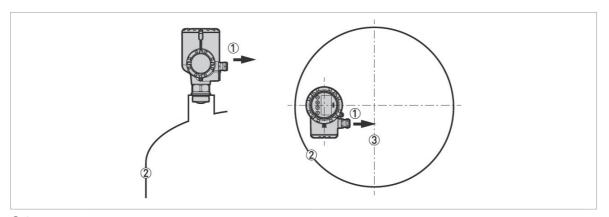
- Insert a gasket between the flanges of the vessel and the TLR7500 and fix them all with bolts and nuts.
- The nozzle length should be as short as possible and kept within the allowable range listed in the table below.
- Use an antenna extension when the antenna is shorter than the nozzle (DN40 lens antenna).



Nozzle dia	motor (ad)		Allowable max.	nozzle length (h)	
Nozzie dia	inleter (Ød)	DN20	DN25	DN40	DN70
[mm]	[inch]	[mm]	[mm]	[mm]	[mm]
20	3/4	50	_	-	_
25	1	50	50	_	_
40	1½	50	50	50*	_
50	2	100	100	150*	_
80	3	150	150	200*	250
100	4	150	200	300*	350
150	6	200	300	500*	550
200	8	300	400	700*	750

*: When an antenna extension is used, its length is added to the allowable maximum nozzle length (DN40 PEEK antenna).

Mounting direction



- ① Cable entry
- ② The nearest tank wall
- ③ Center of tank
- Ideally, the cable entry should be located toward the center of the tank.

ANTENNAS AND THEIR APPLICATIONS

PEEK antenna

T			Lens a	ntenna	
туре	of antenna	DN20	DN25	DN40	DN70
	G¾", ¾ NPT thread	0	×	×	×
	G1", 1 NPT thread	×	0	×	×
	G1½", 1½ NPT thread	×	×	0	×
	G3", 3 NPT thread	×	×	×	0
	50A JIS	×	×	0	×
	80A JIS	×	×	0	0
Process connection	100A JIS	X X O X X X O O X X X O X X X O X X X O X X O O	0		
TOCESS CONNECTION	150A JIS	×	X X X O X X X O X X X O X X O X		
	200A JIS	×	×	×	0
	ASME 2"	×	×	0	×
	ASME 3"	×	×	0	0
	ASME 4"	×	×	×	0
	ASME 6"	×	×	×	0
	ASME 8"	×	×	×	0
	Measuring range	Max. 5m	Max. 10m	X X X O X O X X X X X X X X	Max. 50m
	Beam angle (both-angle)	15 degrees	10 degrees	8 degrees	4 degrees
Intenna specifications	Beam range (one-angle)	132 mm/m	87 mm/m	70 mm/m	35 mm/m
	Antenna extension	-	_	O *1	_
	PEEK flange plate	-	_	O *1	0

O: Most suitable, ×: Not suitable, -: Cannot be used

PTFE antenna

Type	Lens antenna	
туре	DN40	
	50A JIS	0
	80A JIS	0
Draces connection	100A JIS	0
Process connection	ASME 2"	0
	ASME 3"	0
	ASME 4"	0
	Measuring range	Max. 25m
Antonno onocifications	Beam angle (both-angle)	8 degrees
Antenna specifications	Beam range (one-angle)	70 mm/m
	PTFE flange plate	Attached

O: Possible

 $[\]ensuremath{\mathbf{*1}}$: Combination of antenna extension and flange plate is not possible.

MODEL AND SPECIFICATION CODES

Model: TLR7500

DN20 lens antenna

Spec.code VFDF 4 4 W		0	2	1			0	1	0			0	0			Description	Std.
Fixed code VFDF 4 4 W	0	\vdash	+	\vdash	+	\vdash	+	+	\vdash	\dashv	+	+	-			Standard (Non Ev)	0
	1										+					Standard (Non-Ex) ATEX: Intrinsically safe II ½ G Ex ia IIC T6T3 Ga/Gb II ½ D Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	0
	2															ATEX: Flameproof II ½ G Ex db ia IIC T6T3 Ga/Gb II ½ D Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db	
Approval	K															IECEx: Intrinsically safe Ex ia IIC T6T3 Ga/Gb Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
	L															IECEx: Flameproof Ex db ia IIC T6T3 Ga/Gb Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db	
	U															JPN Ex: Intrinsically safe Ex ia IIC T6T3 Ga/Gb Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
	W															JPN Ex: Flameproof Ex db ia IIC T6T3 Ga/Gb Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db	
Fixed code		0						I			I	I				Always 0	0
Approval 2		0									$oxed{T}$					N/A	0
Approval 2		3														NACE design (MR0175/MR0103/ISO 15156)	
Housing type/material			2			П	T	T			T	T				Compact type housing (aluminum), IP66/IP68	0
Output				1		П					\top					Two-wire system/4–20 mA passive (HART®)	0
Cable entry/cable gland				1												$\text{M20}\times 1.5$ without cable gland (Cable entry : For G½ female thread, select M20 \times G½ adapter as an option.) (For JPN Ex of flameproof / dust ingnition, select the Flameproof cable gland (G½) as an option.)	0
				2		Ц		\perp		Ц	1			Ц		M20 × 1.5 with a plastic cable gland	
				3		Ц		\perp		Ц	\perp					$M20 \times 1.5$ with a metal cable gland	
				C	_	Ц				Ц	\perp					$M20 \times 1.5$ with ½NPT female adapter	
Display					0	Ц	\perp	\perp		Ц	\perp	\perp		Ц		Without display unit	
piaj					4	Ц		\perp		Ц	\perp	1		Ш		With a plug-in display unit	0
Display language						1		\perp		Ц	1					English	
. , , , ,						7		\perp		Ц	1	1		Ш		Japanese	0
Fixed code							0	\perp		Ц	\perp	1	_	Щ		Always 0	0
							- 1	1		Ц	1			Ц		FKM/FPM, 0KPa to 4MPa, -40 to 150°C	0
Seal material/temperature	ran	ge						2		Ц	\perp	1	_	Щ		EPDM, 0KPa to 4MPa, -50 to 150°C	
							(3		Ц	\perp	1		Ш		Kalrez®6375, 0KPa to 4MPa, -20 to 150°C	
Antenna type								1								DN20 (¾") lens antenna/PEEK ¾" thread connection	0
Antenna extension									0	П	\top	T				N/A	0
Process connection/type		_		228					_		Р					G ¾A	0
1 100000 COMMECTION/Type		P	ASN	1Ε E	1.2	0.1	, th	rea	d	E	A (³ ∕ ₄ NPT	
Fixed code												0	0			Always 00	0
Accessories														0		N/A	0
														1		Weatherproof protection *2	-
Special specification															Blank	N/A	0
-															/Z	For special requirements *1	

^{\$1:} Special requirements not included in the above coding system should be designated by adding "/Z" at the end of the code. Consult us for the availability of such requirements before ordering.
\$2: Select awning when installing in a place exposed to direct sunshine or heavy wind and rain.

DN25 lens antenna

Spec.code VFDF 4 4		()	2	1			0	2	0	I		0	0			Description	Std.
Fixed code VFDF 4 4				Ш	\perp		Ш											0
	(ו															Standard (Non-Ex)	0
																	ATEX: Intrinsically safe	
	-	1															II ½ G Ex ia IIC T6T3 Ga/Gb	
																	II ½ D Ex ia IIIC T85°CT150°C or T85°CT200°C	
	H		+		-		Н				_	-	+		\dashv		Da/Db	-
																	ATEX: Flameproof	
	2	2															II ½ G Ex db ia IIC T6T3 Ga/Gb II ½ D Ex ia tb IIIC T85°CT150°C or T85°CT200°C	
																	Da/Db	
	H	+	+		+		Н	+		\vdash	+	+	+		\dashv		IECEx: Intrinsically safe	-
Approval																	Ex ia IIC T6T3 Ga/Gb	
γιρρισται	Ι.	`															Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
							П						+		\dashv		IECEx: Flameproof	
	lι	_															Ex db ia IIC T6T3 Ga/Gb	
																	Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db	
		T	\top				П						T		T		JPN Ex: Intrinsically safe	
	Įι	J															Ex ia IIC T6T3 Ga/Gb	
																	Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
																	JPN Ex: Flameproof	
	V	٧															Ex db ia IIC T6T3 Ga/Gb	
		\perp	\perp	Ш	_		Ш		\perp		_	\perp	\perp				Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db	<u> </u>
Fixed code		(_														Always 0	0
Approval 2			0														N/A	0
Approvarz			3														NACE design (MR0175/MR0103/ISO 15156)	
Housing type/material				2													Compact type housing (aluminum), IP66/IP68	0
Output					1												Two-wire system/4–20 mA passive (HART®)	0
							П										M20 imes 1.5 without cable gland	
																	(Cable entry : For G½ female thread, select M20 \times	_
						1											G½ adapter as an option.)	0
Cable entry/cable gland																	(For JPN Ex of flameproof / dust ingnition, select the Flameproof cable gland (G½) as an option.)	
January, January					- -	2	Н	+	+	\dashv	+	+	+		\dashv		$M20 \times 1.5$ with a plastic cable gland	-
						3	Н	_	+	\dashv	+	+	+		\dashv		M20 × 1.5 with a plastic cable gland	-
						0	Н	-		\vdash	+	-	+		\dashv		M20 × 1.5 with a metal cable grand	-
						_	Н	_	+		+	_	+		\dashv		·	-
Display						0	\rightarrow				_		+		\dashv		Without display unit	<u> </u>
-						4	\vdash				_		+		\dashv		With a plug-in display unit	0
Display language							1	_			_	_	+		4		English	
. , , ,							7	_			4		+				Japanese	0
Fixed code								0			_	\perp	+		_		Always 0	0
								1	_		4	1	_	Ш	4		FKM/FPM, 0KPa to 4MPa, -40 to 150°C	0
Seal material/temperatu	re ran	ige						2	_	Ц		1	_	Ш	_		EPDM, 0KPa to 4MPa, -50 to 150°C	<u> </u>
								3			\perp	\perp	_	Ш	\perp		Kalrez®6375, 0KPa to 4MPa, -20 to 150°C	
Antenna type									2								DN25 (1") lens antenna/PEEK	0
									Ľ		4		1	Ц	4		1" thread connection	
Antenna extension										0							N/A	0
Process connection/type	2					3-1,					F			Ш	\perp		G1A	0
			Α	SM	IE E	31.2	0.1	, thr	eac	k	F	4 (1 NPT	
Fixed code													0	0			Always 00	0
Accessories															0		N/A	0
Accessories														Ì	1		Weatherproof protection *2	
0															T	Blank	N/A	0
Special specification															Ī	/Z	For special requirements *1	
																	· · · · · · · · · · · · · · · · · · ·	

^{*1:} Special requirements not included in the above coding system should be designated by adding "/Z" at the end of the code. Consult us for the availability of such requirements before ordering.
*2: Select awning when installing in a place exposed to direct sunshine or heavy wind and rain.

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DN40 lens antenna (Antenna material: PEEK)

Spec.code VFDF 4 4	1 W C	2 1	\mathbf{H}	+	0	3	+	\dashv	+	0	0			Description	Sto
Fixed code 4 4			+	+	+	+	+	+	+	+	\vdash	Н		Standard (Nan Ev)	0
	0			-				4		+	-			Standard (Non-Ex)	
														ATEX: Intrinsically safe	
	1													II ½ G Ex ia IIC T6T3 Ga/Gb	
														II ½ D Ex ia IIIC T85°CT150°C or T85°CT200°C	
				Ш										Da/Db	
														ATEX : Flameproof	
														II ½ G Ex db ia IIC T6T3 Ga/Gb	
	2													II 1/2 D Ex ia th IIIC T85°CT150°C or T85°CT200°C Da/	
														Db	
			+	$\dashv \dashv$		+	\dashv	1		+	\vdash			IECEx : Intrinsically safe	
Approval	K													Ex ia IIC T6T3 Ga/Gb	
-ppiovai														Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
				\perp	_	+	\dashv	_		+	\vdash				
														IECEx : Flameproof	
	L													Ex db ia IIC T6T3 Ga/Gb	
														Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db	
														JPN Ex (-JEx): Intrinsically safe	
	U													Ex ia IIC T6T3 Ga/Gb	
														Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
				-		+	+	\dashv	+	+	+	Н		JPN Ex (-JEx) : Flamproof	
	w													Ex db ia IIC T6T3 Ga/Gb	
	"													Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db	
			+	-	+	+	+	4	+	+	╀	Ш			_
Fixed code	C					Ш	_	4		\perp	\perp			Always 0	0
Approval 2		0												N/A	0
Appioval 2		3												NACE design (MR0175 / MR0103 / ISO 15156)	
Housing type / materia	al	2						T		\top				Compact type housing, aluminium - IP66 / IP68	0
Output		1	+	\top		\Box	1	7		+	T	Н		Two-wire system / 4-20 mA passive HART®	0
Juipui				+		+	+	+	+	+	+	Н		M20 × 1.5 / without cable gland	
											(Cable entry: For G½ female thread, select M20 × G½	_			
Cable entry / cable gland											adapter as an option.)	0			
											(For JPN Ex of flameproof / dust ingnition, select the				
										Flameproof cable gland (G½) as an option.)					
			2											$M20 \times 1.5$ / with a plastic cable gland	
			3	\Box		\top						П		M20 × 1.5 / with a metal cable gland	
			С	\top		\Box		1		+				M20 × 1.5 / with ½ NPT female adapter	
			1 -		+	+	+	+	+	+	+	Н		Without display unit	
Display			_	0	+	+	+	4	+	+	╀	Н			\vdash
				4						1	_			With a plug-in display unit	0
Display language				1						\perp				English	
Display laliguage				7										Japanese	
Fixed code					0									Always 0	0
					1			7		+	\vdash	Н		FKM/FPM, 0 kPa to 4 MPa / -40 to +150°C	0
						2	-	+	+	+	+	Н		EPDM, 0 kPa to 4 MPa / -50 to +150°C	\vdash
Seal material / tenpera	ature rang	je				\rightarrow	+	\dashv	+	+	\vdash	Н		· · · · ·	
					_	3	_	4		+	_			Kalrez® 6375, 0 kPa to 4 MPa / -20 to +150°C	_
					4	1								PEEK (with flange plate), 0 kPa to 4 MPa / -50 to +150°C	
Antenna type						3								DN40 (1.5") lens antenna / PEEK, 1.5" thread or flange	10
чиенна туре						3								connection	\mid
<u></u>							0	T	T			П		N/A	0
Antenna extension / fla	ange plat	е				Ì	1	\dashv	†	+		П		Antenna extension (112 mm / SS316L)	
	go plat	-				1	A	+	+	+	\vdash	H		Flange plate (PEEK)	
	100 000) 1 +6	مط						D ,	+	+	Н			
	ISO 228								P (\vdash	Ш		G1-½A (Not selectable with flange plate)	-
	ASME E	31.20.1	thre	ead			_		Α (Ш		1-1/2"NPT (Not selectable with flange plate)	
							- [1	Н	1 /	4		L		2" 150lb RF	L
	401:-	246 = =					Ī	Н	2 /	4				2" 300lb RF (Not selectable with flange plate)	
Process connection	ASME E	316.5 fla	ange	9			-		1 /		T	Н		3" 150lb RF (Not selectable with flange plate)	
							-		2 /		\vdash	Н			
	1										-	Н		3" 300lb RF (Not selectable with flange plate)	-
			ne.				-		U		_	Щ		50A JIS10K RF	
	JIS B22	20 fland						L	UF	>		i I			
	JIS B22	20 flan	9 0					=	ᅼ.	_	_			80A JIS10K RF (Not selectable with flange plate)	_
Fixed code	JIS B22	20 flan	9 0					= 1	<u> </u>	_	0			Always 00	0
	JIS B22	20 flan								_	0	0		Always 00	0
	JIS B22	20 flanç								_	0	0		Always 00 N/A	_
Fixed code Accessories	JIS B22	20 flanç								_	0	1	DI ¹	Always 00 N/A Weatherproof protection *2	0
	JIS B22	20 flanç								_	0	1	Blank /Z	Always 00 N/A Weatherproof protection *2	_

^{*1:} Special requirements not included in the above coding system should be designated by adding "/Z" at the end of the code. Consult us for the availability of such requirements before ordering.

*2: Select awning when installing in a place exposed to direct sunshine or heavy wind and rain.

DN40 lens antenna (Antenna material: PTFE)

Spec.code VFDF 4 4	1 W	0		2	1	Τ		0 /	- \	A C			C) ()		Description	Std.
	1 W			П	1	T	П		İ	T		П	\top					0
	0			П	\top	\top		\top	Ť	T		\Box	\top		\top		Standard (Non-Ex)	0
				П		\top			T	T			\top		T		ATEX : Intrinsically safe	
																	II ½ G Ex ia IIC T6T3 Ga/Gb	
	1																II ½ D Ex ia IIIC T85°CT150°C or T85°CT200°C	
																	Da/Db	
				П		\top		\top	T				\top		\top		ATEX : Flameproof	
																	II ½ G Ex db ia IIC T6T3 Ga/Gb	
	2																II ½ D Ex ia tb IIIC T85°CT150°C or T85°CT200°C	
																	Da/Db	
									Ť					\dagger	1		IECEx : Intrinsically safe	
Approval	K																Ex ia IIC T6T3 Ga/Gb	
																	Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
			\vdash	H		+		1	†				\perp	\dagger	+		IECEx : Flameproof	
	L																Ex db ia IIC T6T3 Ga/Gb	
	-																Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db	
		+		\vdash	+	+	Н	+		+		H	+		+		JPN Ex (-JEx): Intrinsically safe	
	U																Ex ia IIC T6T3 Ga/Gb	
																	Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
			H	H	+	+		+	$^{+}$				+	+	+		JPN Ex (-JEx): Flamproof	
	w	,															Ex db ia IIC T6T3 Ga/Gb	
	"																Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db	
Fixed code		0	\vdash	H	+	+	Н	+	+	+			+	+	+		Always 0	0
rixed code		U	0	\vdash	+	+	Н	+	+	+		\vdash	+	+	+		N/A	0
Approval 2			3	\vdash	+	+		+	+	+		\vdash	+	+	+			
			3		-	+		_	+				-	+	+		NACE design (MR0175 / MR0103 / ISO 15156)	
Housing type / material				2	_	+		_	+	+			_		+		Compact type housing、aluminium - IP66/IP68	0
Output					1	\bot		_	4	_		Ш	\perp		_		Two-wire system / 4-20 mA passive HART®	0
																	$M20 \times 1.5$ / without cable gland	
																	(Cable entry : For G½ female thread, select M20 \times G½	
					1												adapter as an option.)	0
Cable entry / cable glan	nd																(For JPN Ex of flameproof / dust ingnition, select the	
Cable entry / cable glain	iu				L	\perp			\perp								Flameproof cable gland (G½) as an option.)	
					2												M20 imes 1.5 / with a plastic cable gland	
					3												M20 imes 1.5 / with a metal cable gland	
					C												M20 $ imes$ 1.5 / with $1/2$ NPT female adapter	
Dianley						0											Without display unit	
Display						4				Ī							With a plug-in display unit	0
							1	\top					\top		\top		English	
Display language							7		Ť					T	\top		Japanese	0
Fixed code								0							+		Always 0	0
Seal material / tenperatu	ure ran	пе						1	1	+		\Box	+		+		PTFE, 0 kPa to 1.6 MPa / –50 to +150°C	0
Antenna type		90								1		\Box	+		+		DN40 (1.5") lens antenna / PTFE, flange connection	0
Flange plate									1'	C	-			+	+		Flange plate (PTFE)	0
i larigo piato	T										-	1 .	Δ	+	+		2" 150lb RF	
	VOVI	ASME B16.5 flange										1 /		+	+		3" 150lb RF	
	ASIVII	_ D	10	.J I	iail	ge								+	+		4" 150lb RF	
Process connection											IVI	1 . U	~	+	+			
	110.5	001	20	£I.										+	+		50A JIS10K RF	0
	JIS B	22'	2U	ııar	ige			L U P		+	+		80A JIS10K RF					
											M	U		1	+		100A JIS10K RF	1_
Fixed code													(0	_		Always 00	0
Accessories															0		N/A	0
, 1000001100															1		Weatherproof protection *2	
Special specification																Blank	N/A	0
opeciai specification																/Z	For special requirements *1	
									_									

^{*1:} Special requirements not included in the above coding system should be designated by adding "/Z" at the end of the code. Consult us for the availability of such requirements before ordering.*2: Select awning when installing in a place exposed to direct sunshine or heavy wind and rain.

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DN70 lens antenna

Spec.code	VFDF 4	\rightarrow	\rightarrow	C)	2	-	\dashv	0	4	1	-			0 0)		+	Description	Std
Fixed code	VFDF 4	+ 4	۷۷	0	+	+	+	+	+	\vdash	+	-	H			+		-	Standard (Non-Ex)	0
			-	1															ATEX: Intrinsically safe II ½ G Ex ia IIC T6T3 Ga/Gb II ½ D Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
2			2															ATEX: Flameproof II ½ G Ex db ia IIC T6T3 Ga/Gb II ½ D Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/Db		
Approval				K															IECEx: Intrinsically safe Ex ia IIC T6T3 Ga/Gb Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
				L															IECEx: Flameproof Ex db ia IIC T6T3 Ga/Gb Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/ Db	
				U															JPN Ex: Intrinsically safe Ex ia IIC T6T3 Ga/Gb Ex ia IIIC T85°CT150°C or T85°CT200°C Da/Db	
				w															JPN Ex: Flameproof Ex db ia IIC T6T3 Ga/Gb Ex ia tb IIIC T85°CT150°C or T85°CT200°C Da/ Db	
Fixed code				C	-	\sqcup	-	\perp	+	\sqcup	1	-			1	+		_	Always 0	0
Approval 2					3	\vdash	+	+	+	\vdash	+	-		\vdash	+	+		-	N/A NACE design (MR0175/MR0103/ISO 15156)	0
Housing type/n	naterial				3	2	+	+	+	\vdash	+	-	H		+	+		-	NACE design (MR0175/MR0103/ISO 15156) Compact type housing (aluminum), IP66/IP68	0
Output	natorial					-		+	+	H	+	\vdash			+	+		_	Two-wire system/4–20 mA passive (HART®)	0
Опри							+			H					+	t		_	M20 × 1.5 / without cable gland	
Cable entry/cable gland													(Cable entry: For G½ female thread, select M20 × G½ adapter as an option.) For JPN Ex of flameproof / dust ingnition, select the	0					
Cable entry/cable gland					2	+	+	\vdash	+				+	+		_	Flameproof cable gland (G½) as an option.) M20 \times 1.5 with a plastic cable gland			
					3											-	$M20 \times 1.5$ with a plastic cable gland			
					C											\rightarrow	M20 × 1.5 with ½ NPT female adapter			
0			H	\top	\vdash			\top			_	Without display unit								
Display	Display 4 4										-	With a plug-in display unit	0							
lian lay language											English									
Display langua	splay language 7											Japanese	0							
Fixed code									0	Ш									Always 0	0
										1								-	FKM/FPM, 0KPa to 4MPa, -40 to 150°C	0
0 1 1 1/1										2	+				_	-			EPDM, 0KPa to 4MPa, -50 to 150°C	
Seal material/te	emperatur	e ra	ıng	е						3	+				4	+		\rightarrow	Kalrez®6375, 0KPa to 4MPa, –20 to 150°C	
										4									PEEK (with flange plate), 0KPa to 4MPa, –50 to 150°C	
										4					+	+		_	DN70 (2.75") lens antenna/PEEK	
Antenna type										4	4								3" thread or flange connection	0
Antenna extens	sion/flance	ام م	ate								0	-						-	N/A	0
torina exteris	J.J. I, Hally	- Pi	ale		,						Α	_			\perp	1		_	Flange plate/PEEK	
					-	SO 2					_	L	Р	0	\perp	+		_	G 3A (Not selectable with flange plate)	
					A	SMI	- B1	.20	.1, t	nrea	ad	Ļ		0	\perp	+		_	3 NPT (Not selectable with flange plate)	
												L	1	A	+	+		_	3" 150 lb RF 3" 300 lb RF (Not selectable with flange plate)	
												M		A	+	+		_	4" 150 lb RF (Not selectable with flange plate)	
_												M		A	+	+		-	4" 300 lb RF (Not selectable with flange plate)	
Process conne	ction/				A	SMI	E B1	6.5	, fla	nge		P	1	Α	+	+		_	6" 150 lb RF (Not selectable with flange plate)	
Туре/												P	2	Α	+	+		_	6" 300 lb RF (Not selectable with flange plate)	
Rating												R		Α	\top	\top		_	8" 150 lb RF (Not selectable with flange plate)	
												R	2	Α	+	\dagger		_	8" 300 lb RF (Not selectable with flange plate)	
												L	-	Р	\top			-	80A JIS 10K RF	0
					Ι,	ופ ה	200	J fl∽	.n.~			М	U	Р		J			100A JIS 10K RF (Not selectable with flange plate)	L
					ال	IS B	<i></i> _	טוו כ	uige	7		Р	U			\Box		_	150A JIS 10K RF (Not selectable with flange plate)	
												R	U	_				-	200A JIS 10K RF (Not selectable with flange plate)	
Fixed code															0 0	-		\rightarrow	Always 00	
Accessories																0		_	N/A	0
																1		-	Weatherproof protection *2	
Special specification																	Blan	\rightarrow	N/A	0
opoolal opoolil																	/Z	- 1	For special requirements *1	1

^{\$1:} Special requirements not included in the above coding system should be designated by adding "/Z" at the end of the code. Consult us for the availability of such requirements before ordering.
\$2: Select awning when installing in a place exposed to direct sunshine or heavy wind and rain.

STANDARD ACCESSORIES

Parameter sheet : 1
Instruction manual : 1
Magnet for setting parameters : 1
Tool for opening the converter cover : 1
Tool for removing the display : 1

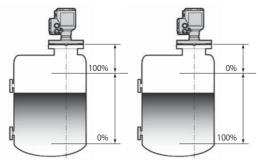
OPTIONS

- M20 × G1/2 female adapter: [GA]
- Flameproof cable gland (G½): [DG]
 Note: Service temperature -40°C to +80°C
- Individual data setting of output ranges: [DS]

ORDERING INFORMATION

Measuring conditions

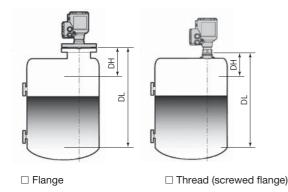
Measuring method ☐ Level ☐ Distance



Measuring range

Distance from the process connection to the lowest level () m

Distance from the process connection to the highest level () m



Measured object

	Name		()							
	Dielectric	constant	(ϵr) ()								
	Fluid		☐ Liqu	ıid	□ Slurry							
	Corrosivit	ty	\square No	\square Medium	☐ Strong							
	Adhesive	ness	□No	☐ Medium	☐ Strong							
	Crystallin	ity	□No	☐ Medium	☐ Strong							
	Waving		□No	☐ Medium	☐ Strong							
	Foaming		□No	☐ Medium	☐ Strong							
Operation conditions												
	Measurin	g location	ı	☐ Outdoor	□ Indoor							
	Fluid tem	perature		()	°C							
	Ambient 1	temperatu	ire	() °C								
	Pressure			() MPa								
	Explosion	nproof		☐ Non-hazardous area								
				☐ Hazardous area								
Vessel co	Vessel conditions											
	Shape	☐ Groun	d tank	☐ Undergro	und tank							
		☐ Closed	d pit	☐ Others								
	Height		()								
	Diameter	or width	()								

Installation conditions

Location	Distance from tank wall	() m
	Distance from inlet	() m
	Distance from obstacle	() m
Mounting n	ozzle		
	Nozzle diameter	() mm
	Nozzle height	() mm

□ N/A

□ Others

☐ Yes: ☐ Agitator (shape:

□ Level switch

□ Ladder

☐ Thermometer

Coating: ☐ Yes ☐ N/A ☐ Others

☐ Reinforcement

ORDERING INSTRUCTIONS

Inner structure

Material

Metal (

1. Model and specification code

Example Model: TLR7500, standard, DN25 lens antenna, G1" thread connection, with weather protection

Specification code: VFDF44W000211470120FP0001 2. Option (specified only when necessary)

Refer to "OPTIONS" and specify any with respective codes.

 Special requirements (specified only when necessary)
 If you have any special requirements, let us know separately from the model and specification code.

Consult us for the availability of such requirements before ordering.

- 4. Intrinsically safe specification
 - This model needs a barrier.
- 5. Flameproof specification

This model needs a flameproof cable gland.

* Specification is subject to change without notice.

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