

TOSHIBA Density (Consistency) Meter LQ500B

Introduction

The LQ500B density (%TS, consistency) meter uses microwave phase shift technology to determine concentrations of solids in the material to be measured flowing through pipes. It can perform a stable and real-time density (%TS, consistency) measurement because this technology is not affected by flow velocity along with fluid color, and also is not easily affected by contaminants and low process pressure rate. As the LQ500B has no moving parts, it is reliable and virtually maintenance-free.

Since the output of the LQ500B is theoretically linear, it can be applied to a wide range of density (%TS, consistency) measurement.

<Notice>

The LQ500B requires a full pipe to measure the density (%TS, consistency). If certain amount of bubbles are obviously mixed in measuring media, there are possibilities of causing measuring error. Contact Toshiba before installation in the following cases:

<Possibility of unfilled condition>

- (a) When it is installed at the discharge of a pump.
- (b) When installation is horizontal, and unfilled condition occurs inside the pipe.
- (c) A process where the pipe becomes unfilled when the operation is stopped.

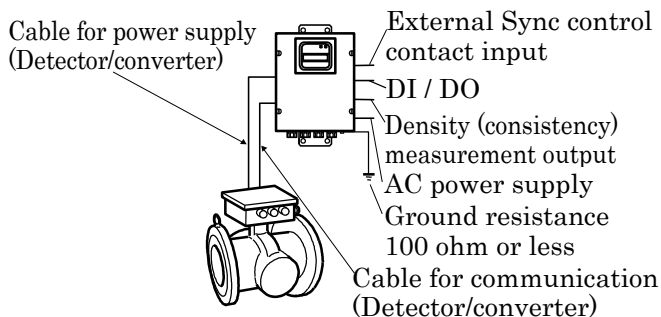


Figure 1. LQ500B Configuration Diagram



Figure 2. LQ500B Density (%TS, consistency) Meter



■ Standard Configuration

- **Density (%TS, Consistency) Meter:** 1 set
(Detector and converter separate mounted)
- **Accessories:** 1 set (see Table 1 below)

Table 1. Standard Accessories

Items	Specifications	Quantity
Power supply cable	Between detector and converter (*1)	32.8 ft (10 m)
Communication cable	Between detector and converter (*1)	32.8 ft (10 m)
Fuse	2A(T), 250 V (glass tube, 0.2" dia. x 0.8")	2
Document	Instruction manual	1

Note 1: Need to prepare a power supply cable for the LQ500B. Cable between detector (RF part) & converter are provided by Toshiba Japan for non-UL only. Refer to the section of cable specifications at the overall specifications in detail.

Note 2: UL units are provided for North and South America markets. The UL units get cable in 30ft multiples.

Specifications

Overall Specifications

Measurement method:

Microwave phase difference method

Measurement range:

Meter size	2" (50 mm)	3" to 12" (80 to 300 mm)
Span (*2)	2 to 50 %TS (*1)	1 to 50%TS (*1)
Lower limit setting range (4 mA)	0 to 48%TS	0 to 49%TS
Upper limit setting range (20 mA)	2 to 50%TS	1 to 50%TS
Setting increments	0.1%TS	

*1 TS: Total Solids

*2 Span = Upper range – Lower range

*3 The material to be measured must be fluid and be filled evenly with no voids.

*4 If the density changes rapidly (less than 1 second), the LQ500B may not measure accurately. The range of measurable density (less than 1 second):

(c = 1.000)

Meter Size	2"	3"	4"	6"	8"	10"	12"
Density [% TS]	16.8	10.5	8.4	5.6	4.2	3.4	2.8

Repeatability:

Meter size	2" (50 mm)	3" to 12" (80 to 300 mm)
Repeatability	±0.02%TS	±0.01%TS

Note 1: Above values are the results of computing ability in the phase measurements of the converter.

Note 2: Density (%TS, consistency) determination repeatability for sample reagent;

Meter size		2" (50 mm)	3" to 12" (80 to 300 mm)
Density (consistency) determination repeatability	For the full scale value of 2% TS or greater	±2%FS	±2%FS
	For the full scale value of less than 2% TS		±4%FS

*The characteristics of sample reagent have errors due to sample tests such as uneven density (%TS, consistency) distribution.

*Full scale is the maximum value in the measurement range, which is the upper limit setting range.

Linearity:

Meter size	2" (50 mm)	3" to 12" (80 to 300 mm)
Full-scale 2% TS or more	±2% TS	±2% TS
Less than full-scale 2% TS		±4% TS

Note: The values are taken at measuring points above 5% of full-scale using simulated reagent.

Electric resolution:

Meter size	2" (50 mm)	3" to 12" (80 to 300 mm)
Electric resolution	0.002%TS	0.001%TS

Note 1: Above values are the results of computing ability in the phase measurements of the converter.

Note 2: Density (%TS, consistency) determination resolution for sample reagent;

Meter size	2" (50 mm)	3" to 12" (80 to 300 mm)
Density(%TS, consistency) determination repeatability	0.1%TS	0.05%TS

* The density (%TS, consistency) determination resolution stated above is defined due to manufacturing limitation to make reagents with stable distribution and a minimum difference of fluid density (consistency).

<Notice>

1. Install a sample tap near the LQ500B as close as possible to get an accurate density (%TS, consistency) measurement using the LQ500B.
2. Take several samples in rapid sequence for more accurate density (%TS, consistency) measurement with less human error factors.

Environmental conditions:

Items	Temperature range	Humidity range
Detector	Standard: 32 to 122 °F (0 to 50 °C)	5 to 90%RH (no condensation)
Converter	32 to 122 °F (0 to 50 °C)	

Temperature code: T4A

Structure: Converter: IP65,
Detector: IP67, Watertight

Note: Outdoor installation is possible. However, provide a sunshade for the converter section if direct sunlight is unavoidable.

Microwave power: Approx. 10 mW

Vibration resistance:

No resonance to the following levels of vibration:

- (1) No failure for 5 to 150 Hz with the following acceleration in each device for 30 minutes on each axis of X, Y, and Z (90 minutes);
Converter: 16.1 ft/s², Detector: 82 ft/s²
- (2) No failure for 5 to 150Hz with the following acceleration in each device for 3 minutes on each axis of X, Y, and Z, 10 times (90 minutes in total);
Converter: 16.1 ft/s², Detector: 82 ft/s²

Note: Avoid using the LQ500B in an environment with constant vibration.

Cables: See the Table 2

Table 2. Cable specifications

Specifications	Cables Between detector (RF part) and converter (*1)		Power supply cable of LQ500B (*2)
	Power supply (24Vdc)	Communication	
Cable type	CVVS-2C-2S	CVVS-5C-1.25S	CVV-3C-2S
Cross-sectional area (*3)	0.003 inch ²	0.002 inch ²	0.003 inch ²
Number of cores	2	5	3
Cable diameter (*4)	0.4" to 0.5"	0.4" to 0.5"	0.4" to 0.5"

*1 32.8 ft (10m) length is packed as standard for non-UL only, not for North or South America Markets.

*2 Need to prepare this cable by the customer.

*3 Need to use a shielded cable.

Approved hazardous locations certification:

UL/UL Class I, Division 2, Groups A, B, C, and D hazardous locations (only detector) Converter is suitable for use in non-hazardous location only.

Weight: Refer to Outline Dimensions (Table 3).

Part 18 of the FCC rules: Certified.

■ Detector Specifications

Meter size: 2" (50mm), 3" (80mm), 4" (100mm), 6" (150mm), 8" (200mm), 10" (250mm), and 12" (300mm)

Flange standard and maximum working pressure:

Flange standard	Maximum working pressure
ANSI Class 150	150 psi (1 MPa)
DIN10 and BS10	10 bar (1 MPa)
DIN 16	16 bar (1.6 MPa)
JIS 10K	150 psi (1 MPa)

Note: Each product passed a hydraulic test under twice pressure rate for 15 minutes toward the specification.

Fluid temperature:

32 to 212 °F (0 to 100 °C) without freezing and bubbles conditions

Allowable fluid conductivity:

Meter size	Fluid conductivity
2" (50mm)	20 mS/cm maximum
3" (80mm)	16 mS/cm maximum
4" (100mm)	15 mS/cm maximum
6" (150mm)	10 mS/cm maximum
8" (200mm)	8 mS/cm maximum
10" (250mm)	8 mS/cm maximum
12" (300mm)	6 mS/cm maximum

Note 1: The LQ500B can not have an accurate density (%TS, consistency) measurement when it is over the specification due to the reducing microwave signal.

Note 2: The LQ500B density (%TS, consistency) measurement maybe be affected in the application where liquids contain highly conductive particles such as active carbon and metal particles.

Consult Toshiba for detail when the measuring liquid contains such particles.

Note 3: Even within the range of conductivity specification, the density (%TS, consistency) readings will change if the value of fluid conductivity varies. For example, if the fluid conductivity value changes 1mS/cm, it causes fluctuating density (%TS, consistency) readings about 0.15% TS. If conductivity change seems to influence the measurement reading, please utilize conductivity correction function.

Wetting materials:

Name	Materials (*1)
Main pipe	Equivalent to 316 SS (standard) (*2, *3)
Temperature detector sheath	316 stainless steel (*4)
Applicator window	Polysulfone (*4)
Applicator window sealant	Fluoric rubber

*1 Avoid using the LQ500B for applications where harmful liquids that cause corrosion, deterioration, or changes in quantity for the used wetting materials. Make sure all materials at these wetting parts are suitable for your CIP before cleaning.

*2 The smoothness inside the pipe on this material is;

Type	Meter size	Smoothness
Standard type	2" to 8" (50 to 200 mm)	No buffing
	10" & 12" (250 & 300 mm)	Buffing # 150
Option type	2" to 12" (50 to 300 mm)	Buffing # 150

*3 State the wetted materials when you choose these options.

*4 The materials of them are changed for abrasive applications. Need to choose the specification code for this application.

Applicator:

Serves as an antenna to send and receive microwave signals, one set provided.

Temperature detector: RTD (Pt100)

Fitting:

Direct fitting to vertical or horizontal piping. (Refer to the section on Piping Precautions.)

■ Converter Specifications

Output signals

- **Density (consistency) measurement output:**

4-20mA_{dc} (load resistance 750 ohm maximum, isolated output.)

- **Density (%TS, consistency) fault or Maintenance signal:**

125V_{ac}, 0.1A (resistive load) solid-state contact; opens when an error occurs in the converter or when the LQ500B is in the setting change mode, otherwise the contact remains closed.

- **Communication signal:**

Digital signal is superimposed on 4-20mA_{dc} current signal (conforming to HART protocol (*1)).

Load resistance: 240 to 750 ohm

Load capacity: 0.25μF maximum

*1 HART (Highway Addressable Remote Transducer) protocol is a communications protocol for industrial sensors recommended by HCF (HART Communication Foundation).

Input signals

- **External synchronized input signal:**

In order to avoid problems of density (%TS, consistency) measurement such as inhomogeneous condition caused by discontinuous process operation and empty pipe condition caused by stopping process operation.

<Specification>

One dry “make” contact;

Contact capacity of approximately 5V_{dc}. 0.1A is required. This contact signal can be used to start or stop density (consistency) measurement in synchronization with an external contact, such as the contacts on a pump.

The measurement starts or stops as follows:

Contact closed: Starts density (%TS, consistency) measurement.

Contact open: Stops density (%TS, consistency) measurement.

- **Density multiplier switching signal:**

In order to achieve selecting up to 4 kinds of liquid concentration measurement independently as maximum.

<Specification>

Two voltage signals described below are required:

Input voltage: H level: 20 to 30 V_{dc}

L level: 2 V_{dc} or less

Input resistance: Approx. 3k ohm

- **Internal conductivity correction function:**

This function reduces the influence (density variation) of the conductivity changing by using the measured value of LQ500B. Thus, this function does not need to input the conductivity meter signal (the correction factor of this function is calibrated with sodium chloride). If this function (Internal conductivity correction) does not reduce the density variation by the conductivity changing, you can use “External Conductivity correction”.

- **External conductivity correction function:**

Conductivity correction signal:

Needs to prepare an additional conductivity meter when using this function. Install in where is able to have a stable and accurate measurement.

<Specification>

Input signal: 4 to 20mA_{dc}

Conductivity range: 0 to 10mS/cm

Update period for density (%TS, consistency)

measurement output and display: Approx. 1 second

Functions by software as standard:

- **Data saving function:**

In order to save measurement data into the memory of converter temporarily.

The oldest data is overwritten.

<Specification>

Data storage points: 256 points maximum.

Period: 1 to 1,800 minutes (1 minute each).

ex 1: The data is saved for approx. latest 4.26 hours when programming every minute.

ex 2: The data is saved for approx. latest 21.3 hours when programming every 5 minutes.

- **Moving average function:**

In order to keep the average density (%TS, consistency) output, or in order to suppress the deflection width of the output. It helps for density

(%TS, consistency) control.

<Specification>

Enable to determine a number from 1 to 999.

• **Change-rate limit function:**

In order to reject the transient density (%TS, consistency) output from noises, or a sudden variation in the output according to intrusion by bubbles, etc....

<Specification>

Allowable rate of change limit: 0.00 to 9.99% TS

Enable to determine a number from 0 to 99.

• **Additive correction function:**

Capable of handling up to ten brands, this function performs the sensitivity correction appropriate to the additives type and compound ratio in accordance with the parameters that are registered in advance.

• **Password function:**

This function is used to limit access to change parameters that affect measured data by means of a password.

• **Number of Rotation N fixed function:**

This function is used to fix the number of angle rotation N when the external synchronized operation starts.

(LQ500B measures the phase of microwave, and calculates the density/%TS from the phase changes. Because the phase is limited from 0 degree to 360 degrees, LQ500B use the rotation N

when the phase is over 360 degree. But the range of density is wide over 360 degrees, LQ500B may not know the number of the rotation N when the pump starts. If the density is constant when the pump starts, LQ500B can set the number of rotation N, and measure the correct density(%TS, consistency).

Arrestor:

Arrestors are installed in the LQ500B current output (4-20mA_{dc}) and AC power lines.

Operation panel and Display:

Used to check data or change various settings.

Operation switches: 5 switches.

Display: 4-line, 20-character VFD(dot-matrix

Power supply:

100 to 240Vac 50/60Hz (Allowable voltage: 85 to 264Vac)

Note1: An additional power supply is required when choosing an optional environmental temperature specification type (-20 to 50 °C).

Refer to the section on Environmental conditions in detail.

Power consumption:

Approx. 15VA (100Vac), Approx. 25VA (240Vac)

Housing material: Steel plate

Coating: Polyurethane

Installation

■ Outline Dimensions

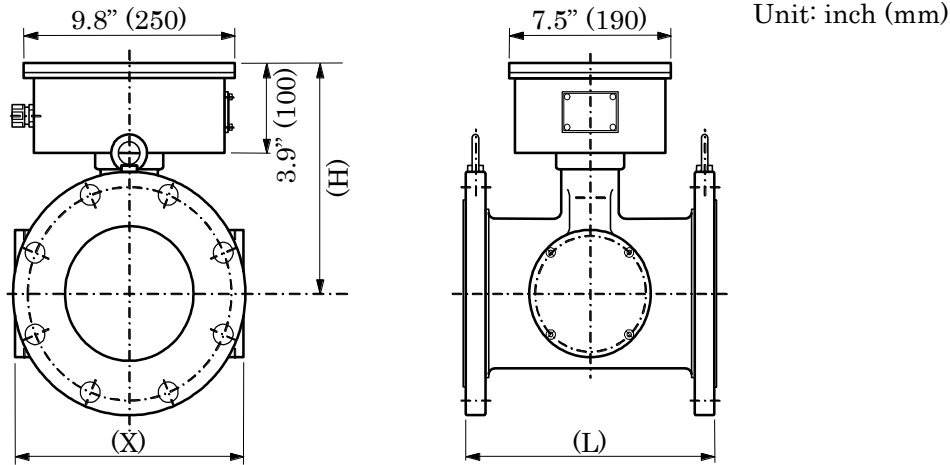


Figure 3. LQ500B detector outline dimensions

Table 3. LQ500B detector outline dimensions

Size inch (mm)	Dimensions, Unit: inch (mm)			Weight, Unit: kg (lbs)			
	X	H	L	DIN 10	DIN 16	ANSI 150	JIS 10K
2" (50)	6.7" (170)	8.9" (225)	11.8" (300)	Approx. 25	Approx. 25	Approx. 24 (53 lb)	Approx. 24
3" (80)	7.9" (200)	8.9" (225)	11.8" (300)	Approx. 31	Approx. 31	Approx. 32 (71 lb)	Approx. 27
4" (100)	8.7" (220)	9.4" (240)	11.8" (300)	Approx. 33	Approx. 33	Approx. 36 (79 lb)	Approx. 31
6" (150)	10.6" (270)	10.2" (260)	11.8" (300)	Approx. 46	Approx. 46	Approx. 47 (104 lb)	Approx. 45
8" (200)	12.6" (320)	11.4" (290)	11.8" (300)	Approx. 58	Approx. 58	Approx. 59 (130 lb)	Approx. 54
10" (250)	11.8" (300)	12.4" (315)	13.8" (350)	Approx. 75	Approx. 78	Approx. 78 (168 lb)	Approx. 74
12" (300)	14.2" (360)	13.4" (340)	13.8" (350)	Approx. 85	Approx. 92	Approx. 106 (234 lb)	Approx. 83

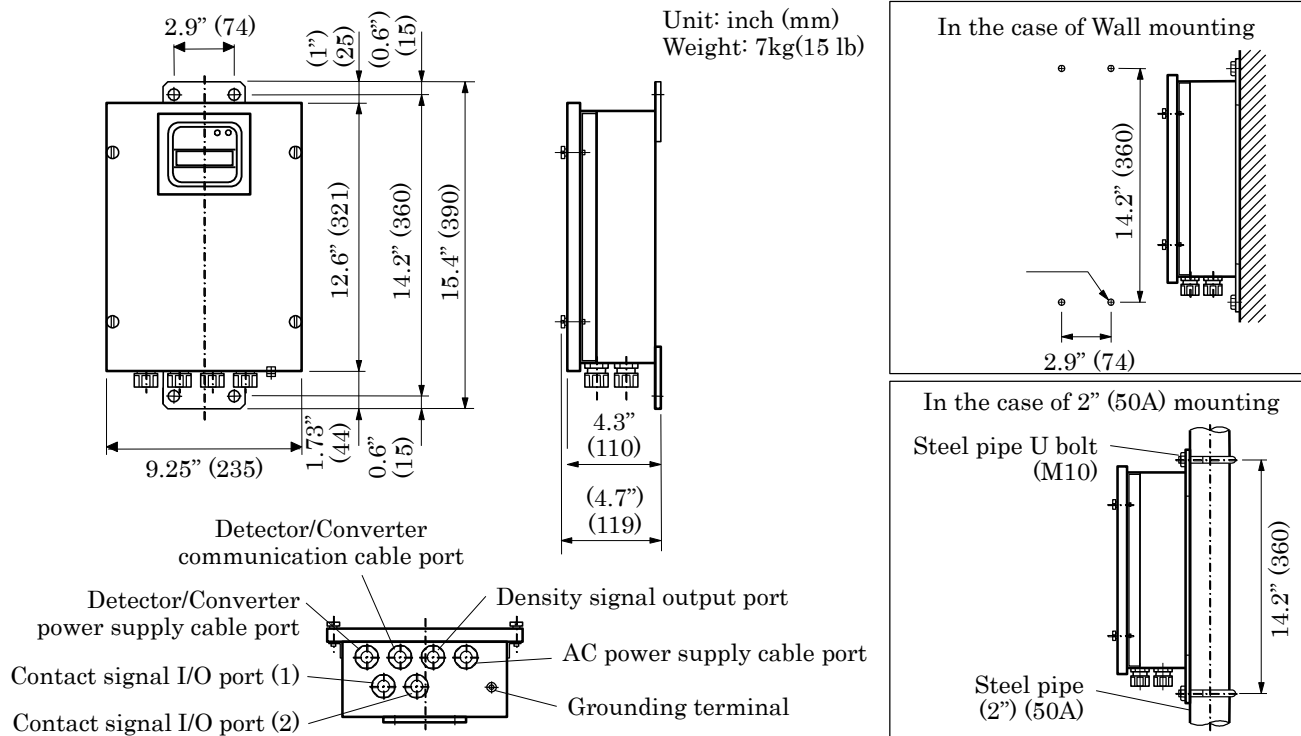


Figure 4. LQ500B Converter outline dimensions

■ Installation Precautions

- (1) Choose a place that is free of vibrations and corrosive gasses as possible, and has ample space for maintenance.
- (2) Secure maintenance space around the converter and detector RF section. (Refer to Figure 5)
- (3) In the case of outdoor installation, provide coverage against sun and rain. (both converter & detector)
- (4) It is recommended that the converter be installed about 1.5m (the position of windows) from the floor. The display is on the front panel of the density/%TS meter. Install the converter in a location and orientation easy to see this display.
- (5) Do not install the meter in a place where there is a possibility of leakage of flammable or explosive gas.
- (6) Do not install the meter in any of the following places:
 - A place where condensation occurs due to a sudden temperature change.
 - A place where extreme low or high temperatures occurs outside the specification range.
 - A place near the equipment generating strong radio waves or electric fields.
- (7) Install the meter in a place where air bubbles are not generated, where pipe is always full of fluid, and sedimentation and accumulation of solid matter do not occur.
- (8) Install the meter in a place where density distribution is uniform. If the distribution inside the pipe is uneven, manual analysis data and the indicated value of the density meter may not show the same value.
- (9) Ensure that the flow rate of the fluid to be measured is 0.6m/s or more.
- (10) Make sure the upstream and downstream pipes have enough strength to hold the density meter. If it is not possible, provide a supporting base to hold the density meter.
- (11) Wetted materials of Detector spool pipe: Equivalent to 316L SS, Measuring window: Polyetheretherketone, O-ring: Silicon rubber, Liquid temperature sensor: SUS316L. Install the meter in a place where measuring liquid or environment does not corrode these materials.
- (12) The Density meters converter and detector spool piece are provided in matched sets. Install and make sure the serial number of each converter and detector combination are the same. If the converter is installed with a different detector, density measurement may not be performed correctly.
- (13) If the density changes rapidly (less than 1 second), the LQ500B may not measure accurately. The range of measurable density (less than 1 second)

(c = 1.000)

Meter Size	2"	3"	4"	6"	8"	10"	12"
Density [% TS]	16.8	10.5	8.4	5.6	4.2	3.4	2.8

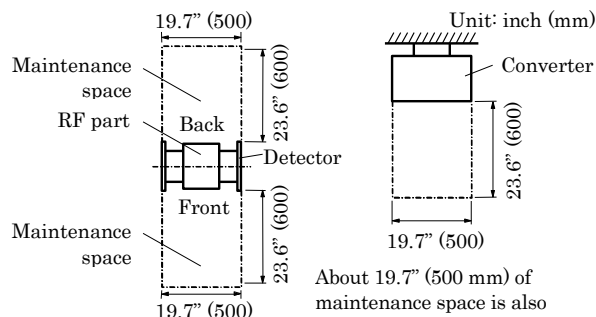


Figure 5. Clearance space

■ Piping Precautions

- (1) Install the meter in a place where density distribution is uniform. If the density distribution in the density meter pipe is uneven, the manually obtained analysis value and the density meter indicated value may be different.
- (2) Install the density meter in a location where the material to be measured flows and fills inside the detector pipe and bubbles do not remain. If the material to be measured does not fill the pipe or bubbles remain, a measurement error occurs or the density indication fluctuates. If there is a possibility of such a condition, we recommend you to avoid installing the density meter on the suction side of a pump and instead install it on the pump discharge side.
- (3) Avoid such a location where the measured matter will settle and build up on the bottom of the density meter.
- (4) Avoid locations which will allow bubbles to move into the pipeline.
- (5) We recommend that the density meter should be installed in a vertical piping system. Horizontal installation is also possible with the same performance. Vertical installation must be recommended if the following conditions exist:
 - a) Bubbles may stay in the pipe.
 - b) Slow flow speed or other factors may cause the measured matter to sink or float substantially making the distribution of the measured-matter density uneven in the pipe.
 - c) The main pipe has been enlarged thus using the density meter of a diameter greater than that of the main pipe.
- (6) When installing on the horizontal piping, make sure that RF section must be on the top for purposes of maintenance and performance assurance (in other words, so that the paired applicator sections are placed directly side by side).
- (7) This density meter does not distinguish between the upstream side and the downstream side. Neither does it require a straight tube length. Install it in a direction that will make maintenance easy.
- (8) When you anticipate a marginal error between the side-to-side dimensions of this density meter and the installation space of the piping line,

prepare a loose mechanism in advance.

- (9) To minimize the impact of the bubbles, it is recommended that the meter be installed in a location as far as possible from the pipe outlet for air release but still within the distance where a reasonable degree of hydraulic pressure is applied.
- (10) In the event that the density meter may no longer be full of the fluid while the pump is shut down or the density distribution in the density meter may become uneven, make sure to take measurements only while the pump is operating by using the external synchronized function.
- (11) Take necessary measures to prevent vibration from a pump or other equipment applied to the density meter transmitted through the piping.
- (12) On both the upstream and downstream sides of the density meter, install isolation valves. Furthermore, between these valves and the density meter, install the sampling port, the zero water supply port, the air release port, and the drain port with a stop valve attached respectively. In the event that the flow of the pipeline cannot be stopped, provide a bypass pipe halfway with a stop valve attached. When performing zero point calibration, these are needed to discharge the measured matter out of the density meter through its drain port and fill up the meter with fresh water of zero density. (See Figure 6 and Figure 7)
- (13) As for gaskets to be used in piping, select the one with the dimension conforming to the flange standard and of the material appropriate for the substance to be measured.
- (14) The front side of the density meter's converter section is equipped with a density display section. When installing the meter, choose a location and direction in which this density display section will be easily visible.
- (15) If the cover of the density meter is removed or the density meter is disassembled while the meter is powered, radio waves will leak out. (However, the amount is about equal to PHS and one-tenth of mobile phones.)
- (16) For both horizontal and vertical piping systems, install a support stand under the density meter with bolts put through the installation holes (M8 size) on the bottom of the density meter. Then install the support stand together with the density meter to a solid ground or wall. Bolts (four M8 bolts) are not attached as accessories to the density meter. Please prepare these bolts separately

NOTE:

• **Zero point water valve:**

Used to supply drinking water (density or consistency 0%) to the detector pipe for zero point adjustment. Install this valve at the top of the pipe in the case of horizontal installation. It is recommended that a 1-inch ball valve be installed on the top of the pipe and zero point water supplied through this inlet using a vinyl hose etc.

Note: If valve water pipe is connected to this valve, air cannot be extracted. Therefore, another valve (vent valve) is needed to extract air.

• **Vent valve:**

Used to vent process fluids to open air when performing zero adjustment. This helps the drinking water (density or consistency 0%) enter the detector pipe easily. Install this valve on the top of the pipe in the case of horizontal installation.

• **Drain valve:**

Used to drain the fluids before supplying drinking water (density or consistency 0%) to the detector pipe for zero adjustment. Install this valve at the lowest point of the pipe. It is recommended that a 1-inch ball valve be installed at the lowest point of the pipe.

• **Sampling valve:**

Used to extract fluids for manual analysis. Install this valve to the side of the pipe in the case of horizontal installation. It is recommended that a 1-inch ball valve be installed to the side of the pipe.

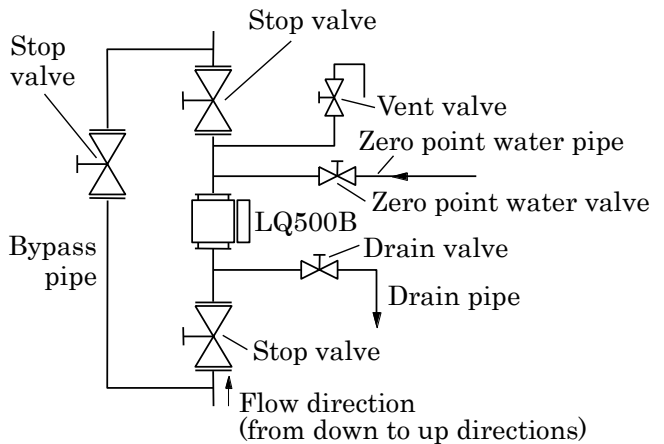


Figure 6. Recommended Installation (vertical installation)

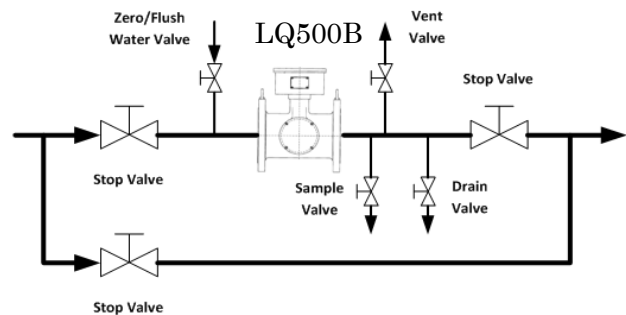
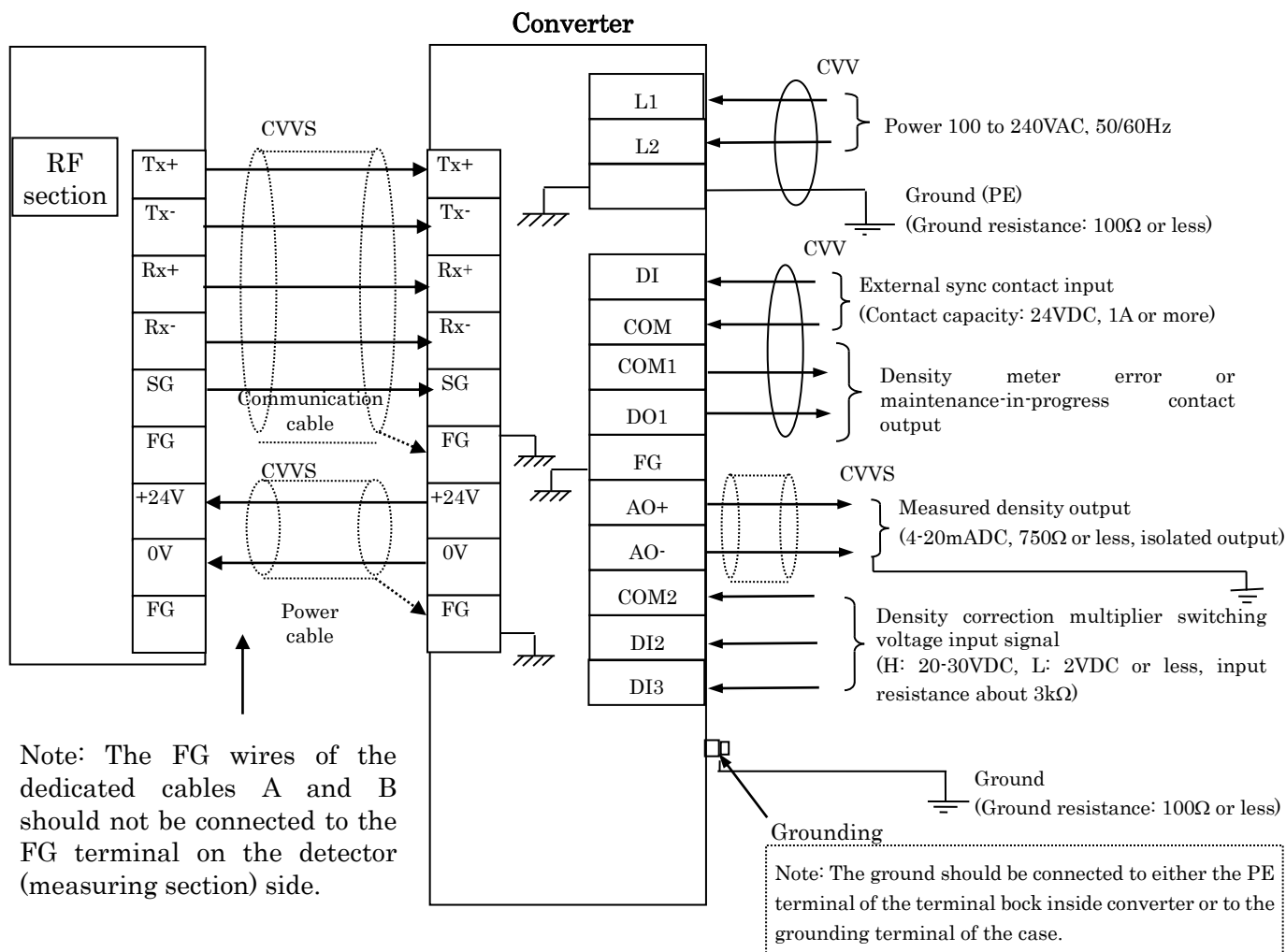


Figure 7. Horizontal installation (*inside the pipe is always filled)

■ Wiring Precautions

- (1) Provide a switch and a fuse to isolate the unit from the main power for ease of maintenance.
- (2) Ground the LQ500B with 100 ohm or less ground resistance. Do not use a common ground shared by other power equipment.
- (3) Use the provided system cables for communication and power supply between detector and converter. Connect cables to the terminals that match the marking on the cables.
- (4) Use a shielded cable with 2mm² cross-sectional area for AC power cable.
- (5) The cables should be free from vibration and should have no slack in the cables.
- (6) Wire the LQ500B output in conduit separated from those of AC power cable, control signals, alarm signal or other cables which could become the source of noise.
- (7) Use a 2-wire shielded cable to wire the LQ500B output (4-20mAdc) and conductivity signal. Ground the shielded cable on the receiving instrument side for both cables.
- (8) As the cable port is made air-tight using a packing, tighten the cable gland securely when all the wiring is completed. Tighten the terminal screws securely. Its suitable torque is 1.0 to 1.7 N·m. In case of UL hazardous locations certification type, cable gland is not provided.
- (9) Screws at the terminals are needed to tighten with 1.2 N·m torque (1.4 N·m is maximum).
- (10) Do not turn on the power supply under uninstalled condition.
- (11) Each cable in the communication cable and power supply cable between detector and converter has banded marks for each terminal. Connect them correctly without any mismatches.



Note : Ground the shielded cable on the receiving instrument side.

Figure 8. External connections

**Table 4. Type Specification Code
(LQ500B Density (consistency) Meter)**

TYPE					CAT Code							SPECIFICATION
1	2	3	4	5	6	7	8	9	10	11	12	
L	Q	5	0	0								Microwave Density (Consistency) Meter
					B							Standard
												Meter Size
						0	5					2" (50mm)
						0	8					3" (80mm)
						1	0					4" (100mm)
						1	5					6" (150mm)
						2	0					8" (200mm)
						2	5					10" (250mm)
						3	0					12" (300mm)
												Mounting Style
					B							JIS 10K flange connection
					C							ANSI 150 flange connection
					E							DIN 10 flange connection
					F							DIN 16 flange connection
					G							BS10 flange connection
												Purpose
						A						Standard (without wireless function)
						D						for UL hazardous locations type (only detector)(without wireless function)
						E						Standard (with wireless function)
												(Note 3)
						F						for UL hazardous locations type (only detector)(with wireless function)
												(Note 3)
												Wetting parts
						A						Equivalent to 316L SS pipe (standard)
						B						Equivalent to 316L SS pipe with Fluorocarbon resin coating for sticky application (Note 1)
						C						Equivalent to 316L SS pipe for abrasive application (Note 2)
												Cable length between detector (RF part) & converter
						A						32.8 ft (10 m) (Note 4)
						B						65.6 ft (20 m) (Note 4)
						C						98.4 ft (30 m) (Note 4)
						D						131.2 ft (40 m) (Note 4)
						E						164 ft (50 m) (Note 4)
						F						Without Cable(for UL only)(Note 5)

Note 1: Fluorocarbon resin coating is applied only to the main pipe. The applicator window (polysulfone) is not coated with Fluorocarbon resin.

Note 2: Change the applicator window and RTD.
 The material of the applicator window is Ultra High Molecular Weight Poly Ethylene
 Fluid temperature:32 to 122°F (not freezing).
 Change the dimensions of the RTD sheath.


Note 3: Wireless type is not implemented. This feature will be implemented in the future.

Note 4: Cable between detector (RF part) & converter are provided by Toshiba Japan for non-UL only.

Note 5: UL units are provided without cable for North and South America markets.
 The UL units require cable to be purchased in 30ft increments.

ISO9001 and ISO14001 are certified.

Specifications are subject to change without notice.
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