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Ultrasonic Level Transmitter

FineTek

Innovation · Quality · Sharing

PRODUCT INTRODUCTION

INTRODUCTION

The ultrasonic level Indicator is a low-cost, noncontact and easy-to-install measurement device. It is able to meet the every-day needs of commercial production, as well serving a more specialized role in the technologically-advanced aero-space industry, thus placing it firmly in the category of high-level measurement technology. Unlike other level indicators with limited uses, the easy-to-install ultrasonic level indicator is a highly-accurate device with enough specialized uses to ensure that the needs of the customer are met.

FEATURES

1. Non-contact.Not effected by material property, such aspressure environments, viscosity and specific gravity.
2. Integrated keypad with security code.
3. Easy installation and low operating costs.
4. ATEX Hazardous area certification.
5. Maintenance-free.
6. Easy to set program no need to train personal.
7. The distance between the transducer and control equipment can be up to 300M.
8. Fully isolated analog output.
9. Better accuracy and stability in difficult conditions.
10. Internal temperature compensation improves accuracy.

MAIN FUNCTION

1. Level measurement (height above datum).
2. Distance measurement (distance from a datum).
3. Volume measurement.
4. Differential level measurement
5. Open channel flow measurement.
6. Pump control.

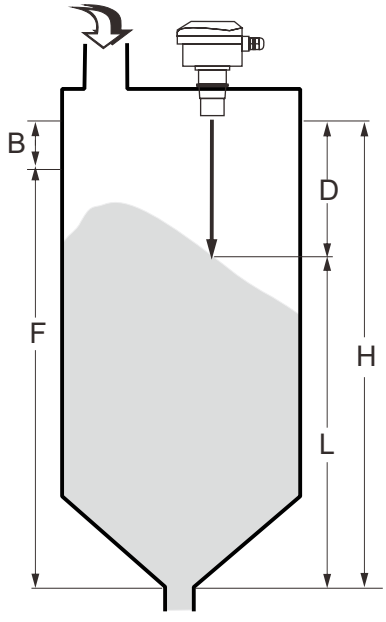
THEORY

principle of operation of the ultrasonic sensor system is to use the ultrasonic pulses which are transmitted by the transducer to the surface to be monitored and are reflected back to the transducer, the time period between transmission and reception of the sound pulses is directly proportional to the distance between the transducer and surface, A The micro-controller computes this time period for all echoes received and analyses them to determine which is the correct reflection from the material surface, it uses this data as the basis for giving control outputs and displays in usable engineering units. The distance D is determined from the velocity of sound and the time period t by the formula:

$$D=v.t/2$$

Example:

With the velocity of sound = 334.1 M/s, a time period of 60m/s corresponds to a transmission path of 20.046M and thus to a distance of 10.023M.



B = Blanking distance

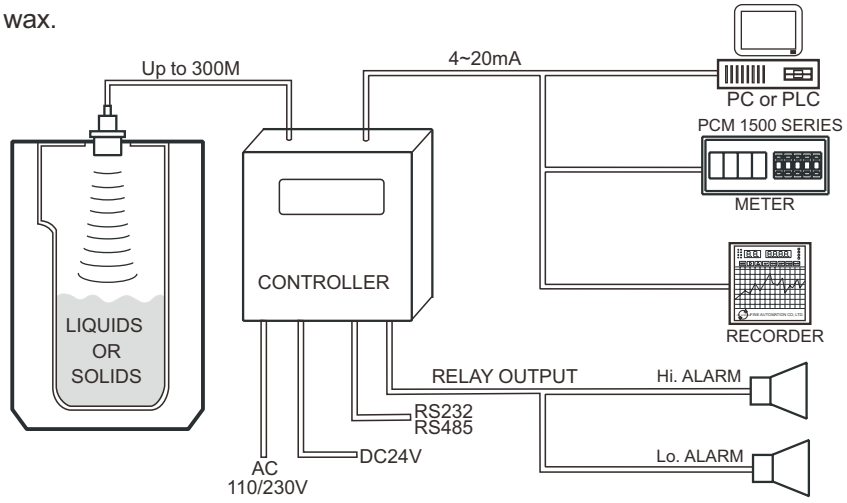
D = Distance from transducer

L = Height in silo

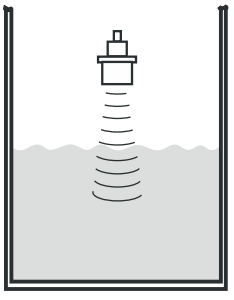
F=4~20mA Match height

REMOTE TYPE APPLICATION FIELD

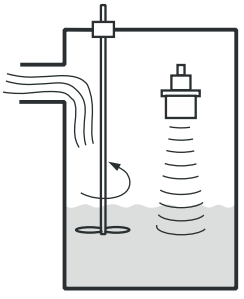
1. Sewage/waste water/tapwater treatment equipment. Such as silos, open channels, dams and wells.
2. Liquids such as edible-oils, sauces, diesel oils and beverages.
3. Chemical material such as solvent, paints, carbonic acid, water, crude oil, epoxy resin, lime slurry and wax.
4. Granular materials such as flour, wheat and corn.
5. Chemical fibers, petrochemical materials such as plastic powders, plastic granules and plastic chips



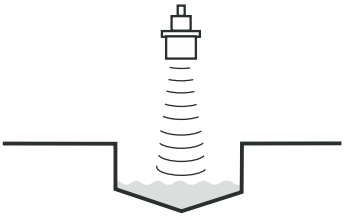
Liquid/Powder measurement



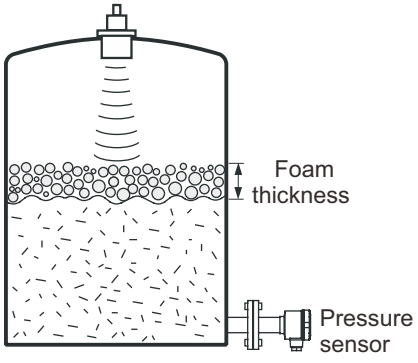
Silo with rotational aiming kit



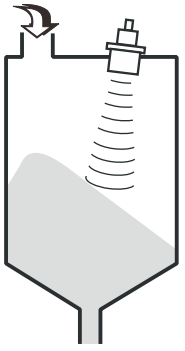
Flow measurement



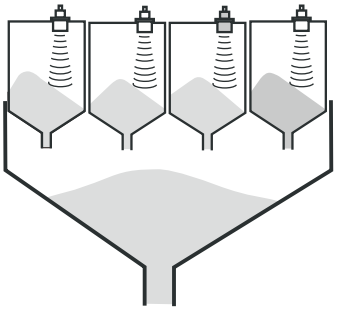
Foam thickness measurement



Measuring in agitator tank



Material Mixing



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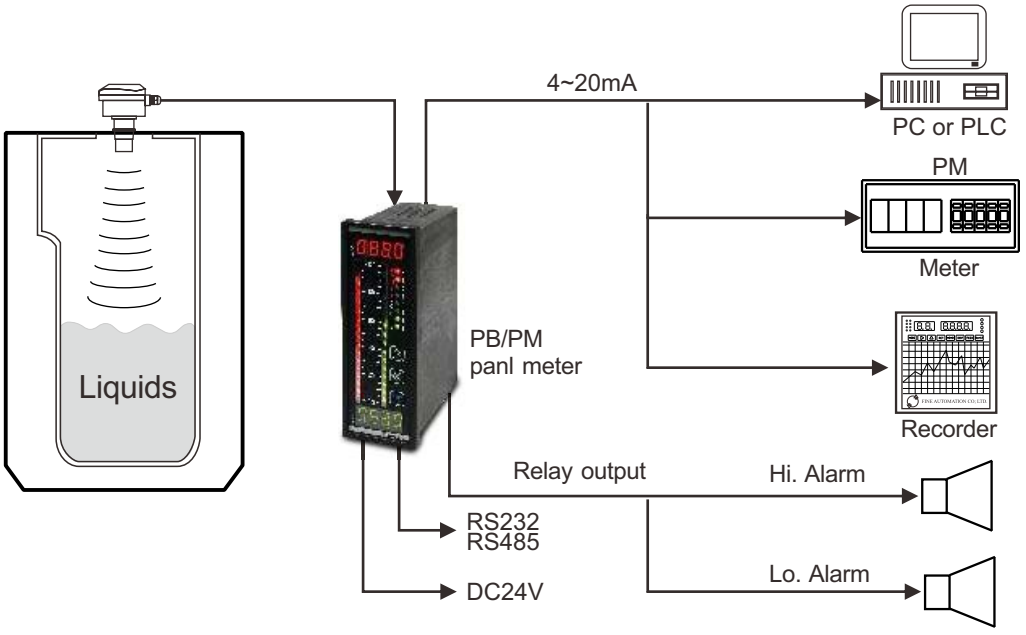
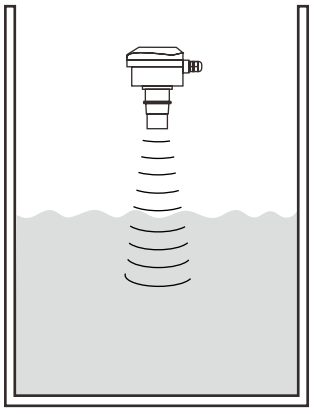
STANDARD TYPE APPLICATION FIELD

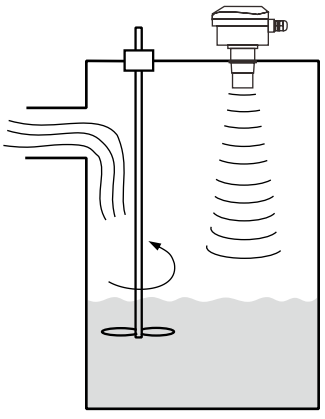
1. Water or waste water treatment equipment: pumps, open channels, dams and wells.
2. Edible-oils, sauces and beverages.
3. Chemicals: paints, carbons, water, crude oil, epoxy resin, lime slurry and wax.
4. Diesel, Petrochemicals, alchohols, solvents etc.



Liquid measurement



Silo with rotational aiming kit



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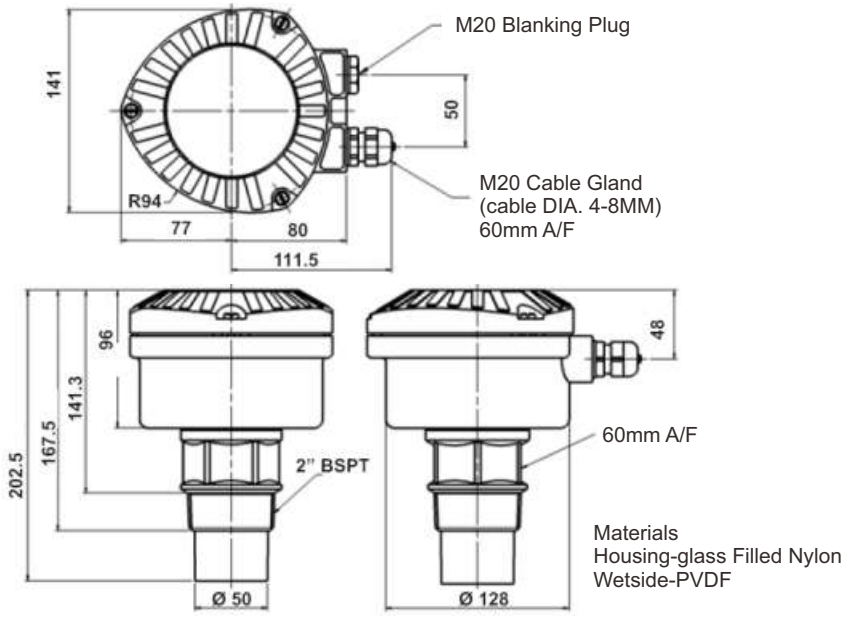
STANDARD TYPE SPECIFICATION

Type / Specifications	MICROFLEX-C	MICROFLEX-CER	MICROFLEX-CIS
Measuring Range	8M	11M	11M
Accuracy	<1.0m ± 5mm. >1.0m ± 0.5%*	<1.0m ± 2.5mm. >1.0m/3.3ft ± 0.25%*	<1.0m ± 2.5mm. >1.0m/3.3ft ± 0.25%*
Resolution	1mm	1mm	1mm
Dead band	300mm	450mm	300mm
Ambient temperature	-20°C~70°C	-40°C~60°C	-40°C~60°C
Operating temperature	-20°C~70°C	-30°C~70°C	-30°C~70°C
Operating pressure	-0.25~3Bar	-0.25~3Bar	-0.25~3Bar
Power supply	2 wire 12~30Vdc	2 wire 12~30Vdc	2 wire 12~30Vdc
Analog output	4~20mA(750 Ohm)	4~20mA(750 Ohm)	4~20mA(750 Ohm)
Relay output	None	2XSPST/1A 24V DC	None
Communication protocol	None	HART	HART
Display	4 digital 12mm LCD	4 digital 12mm LCD	4 digital 12mm LCD
Electrical entry	2XM20X1.5	2XM20X1.5	2XM20X1.5
Transducer material	PVDF	PVDF	PVDF
Beam angle	±6°(3dB)	±6°(3dB)	±6°(3dB)
Casing material	Nylon	Nylon	Nylon
Process connection	2" BSPT/NPT	2" BSPT/NPT	2" BSPT/NPT
Protection rating	IP67	IP67	IP67
Electromagnetic compatibility	CE EN 50081-1 CE EN 50082-2	CE EN 50081-1 CE EN 50082-2	CE EN 50081-1 CE EN 50082-2
Explosion rating	None	None	EEx ia II C T4~T6
Weight	850g	1200g	1200g



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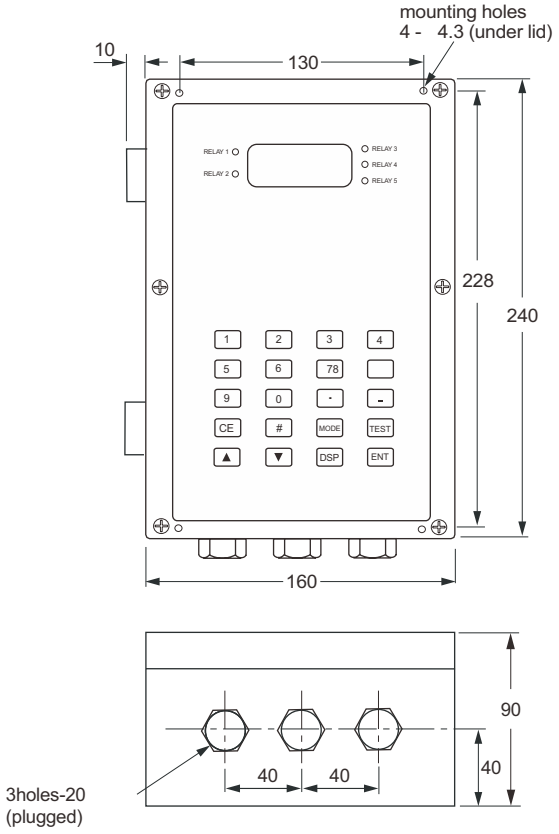
REMOTE TYPE SPECIFICATION OF CONTROLLER

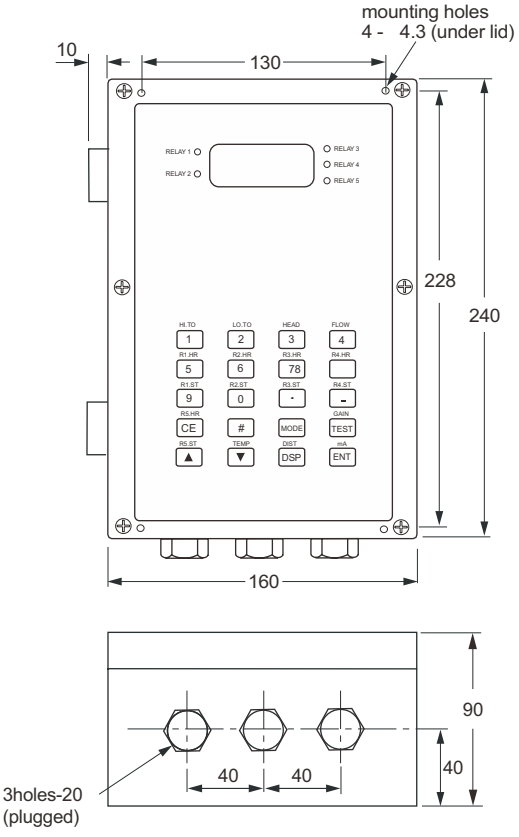
Model / Spec.	REFLEX	MULTIFLEX	MINIFLEX-LR
Accuracy of change in level	0.25% of measured distance	0.25% of measured distance	0.25% of measured distance
Resolution	2mm or ±0.1% of empty distance whichever is the greater	2mm or ±0.1% of empty distance whichever is the greater	2mm or ±0.1% of empty distance whichever is the greater
Power supply	110/230VAC 50/60/Hz 12VA selected automatically 24VCD 10W, separate terminals	110/230VAC 50/60/Hz 12VA selected automatically 24VCD 9W, separate terminals	110/230VAC 50/60/Hz 12VA 24VDC 9W, separate terminals
Relay output	5XSPDT 5A/230VAC resistive.	5XSPDT 5A/230VAC resistive.	3XSPDT 8A/230VAC resistive.
Analog output	4-20mA / 20-4mA 750 Ohms, 16bit	4-20mA / 20-4mA 750 Ohms, 16bit	4-20mA / 20-4mA 750 Ohms, 16bit
Serial output	RS232 / 485	RS232 / 485	RS485
Interface	5x4 Keypad, integral membrance 4 digit security coded	5x4 Keypad, integral membrance 4 digit security coded	5 push buttoms
Indication	Multiline display	LCD Module, 5 red LED's for relay status	2 lines 16 digit alphanumeric backlit LCD
Blanking	Programmable (min. 0.3m dependent on transducer)	Programmable (default value) 0.5m)	Fully adjustable (default value 0.5m)
Linearisation	7xfamiliar tank shapes or user-definable 16 point curve	7xfamiliar tank shapes or user-definable 16 point curve	_____
Memory	Non-volatile EEPROM (without battery)	Non-volatile EEPROM (without battery)	Non-volatile EEPROM (without battery)
Ambient Temp.	-20°C~50°C	-40°C~70°C	-20°C~70°C
Scan rate	Programmable-min. 30 seconds	_____	_____
Enclosure	IP65 Polycarbonate hinged lid 240hx160wx90d (mm)	IP65 Polycarbonatehinged lid 240hx160wx90d (mm)	IP65 Polycarbonate hinged lid 185hx213wx119d (mm)
Weight (kg)	1.75	1.75	1.55
Suitable material	Solid / liquid	Solid liquid	liquid,slurries&pastes
Measured distance (Max.)	50M	12M 15M	10M
Transducer	RYTK15 RXM19 RXM19ER	RYTK15 RWTK15	RYTK15 RWTK15

REMOTE TYPE OF CONTROLLER

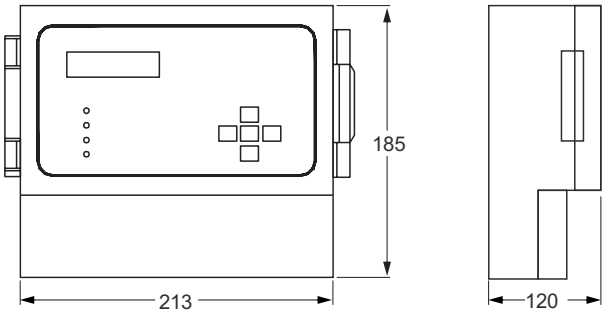
MODEL: REFLEX



MODEL: MULTIFLEX



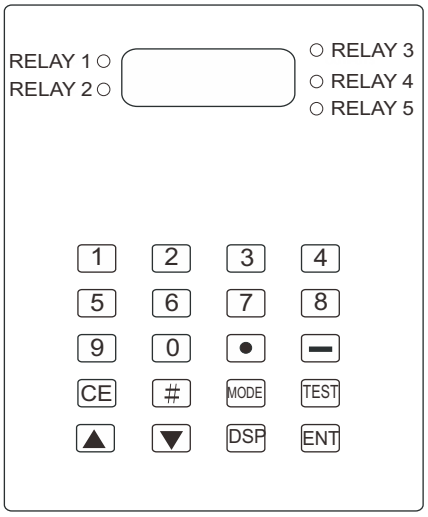
MODEL: MINIFLEX-LR



REMOTE TYPE INTEGRATED KEYPAD

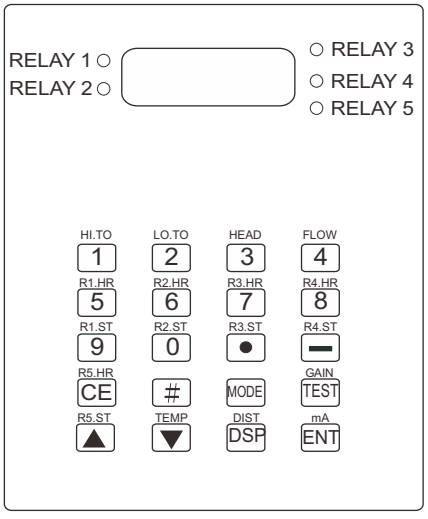
MODEL: REFLEX

0-9 : Numerical Values
• : Decimal Point
— : Negative Value and used to slow down simulation Pr. 78
CE : Clear Entry or leave test functions Pr. 75 to 78
: In normal 'RUN' mode it display unit status and in "Prog" mode it advances point number. (also speeds up simulation Pr. 78)
MODE : Alternates between "RUN" and "Prog" mode.
TEST : Displays gain in "RUN" mode and allows parameter interrogation and simulation hold in "Prog" mode.
▲ : Increase parameter number.
▼ : Decrease parameter number.
DSP : Display parameter number/value alternately.
ENT : Enter a new value or initiate a system test under Pr. 75 to Pr. 78.



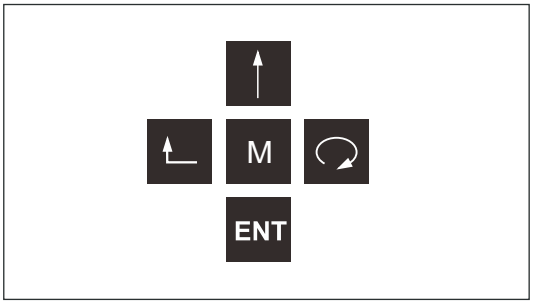
MODEL: MULTIFLEX

0-9 : Numerical Values
• :Decimal Point
— : Negative Value
CE : Clear Entry
: Returns display to normal "RUN" mode after viewing secondary functions (also speeds up simulation Pr. 78).
MODE : Alternates between "RUN" and "Prog" mode.
TEST : Displays gain or confidence in "RUN" mode and allows parameter interrogation and simulation hold in "Prog" mode.
▲ : Increase parameter number.
▼ : Decrease parameter number.
DSP : Display parameter number / Value alternately.
ENT : Enter a new value or initiate a system test under Pr. 75 to Pr. 78



MODEL: MINIFLEX-LR

M : to go from "RUN" to "Prog" To go from parameter Number to parameter value.
ENT : Enter/Run - to enter a value. change or to return from "Prog" to "RUN" mode.
↑ : Increase a parameter No. or Value.
↵ : Moves cursor left.
↷ : Moves cursor right.



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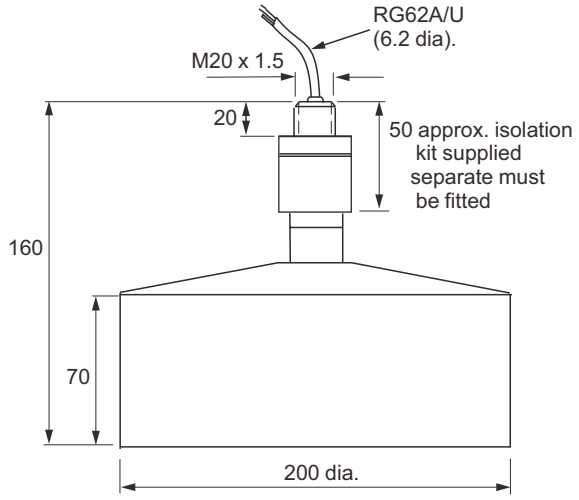
REMOTE TYPE SPECIFICATION OF TRANSDUCER

Spec. \ Model	RYTK15	RWTK15	RXM19	RXM19ER
Body Material	Xenoy	PVDF	P.P	P.P
Face Material	**G.R Epoxy	PVDF	P.E	P.E
Frequency (kHz)	41.5 KHz	41.5 KHz	19 KHz	17 KHz
Beam angle	12°	12°	5°	5°
Max. Range Liquids	15M(*1) 15M(*2) 10M(*3)	13M(*1) 15M(*2) 10M(*3)	30M(*1)	50M(*1)
Max. Range Solids	8M(*1) 12M(*2) N/A(*3)	12M(*2) N/A(*1)	25M(*1)	35M(*1)
Temp.	-40°C~90°C	-40°C~90°C	-40°C~90°C	-20°C~60°C
Hazardous Area	EExMIIT6	EExMIIT6	No	No
Protection	IP68	IP68	IP68	IP65
Weight	2.0kg	2.0kg	2.8kg	4.8kg
Mounting	M20	M20	M20	M32

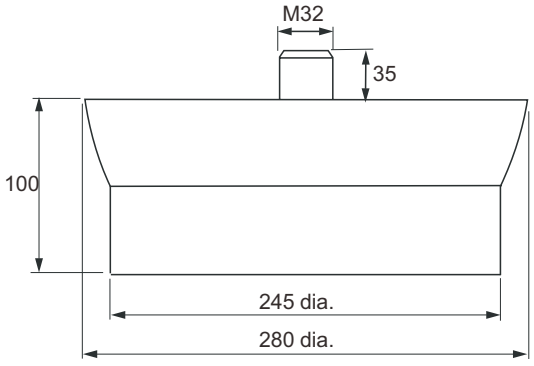
*1 used with REFLEX controller
*2 used with MULTIFLEX controller
*3 used with MINIFLEX-LR controller
** Glass Reinforced Epoxy
The above Max. Range are offered by base on sound velocity 340m/s at 20°C atmosphere environment.

APPEARANCE OF TRANSDUCER

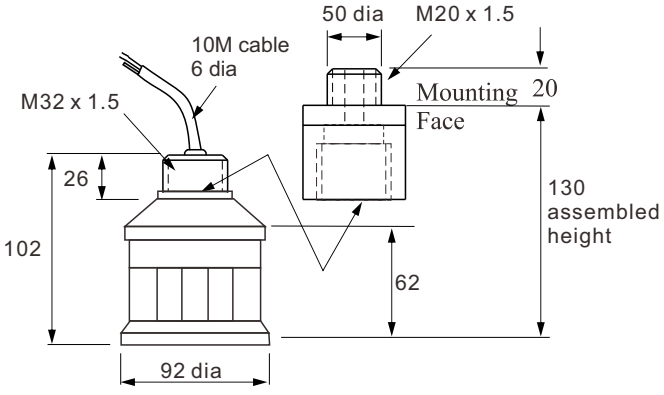
MODEL: RXM19



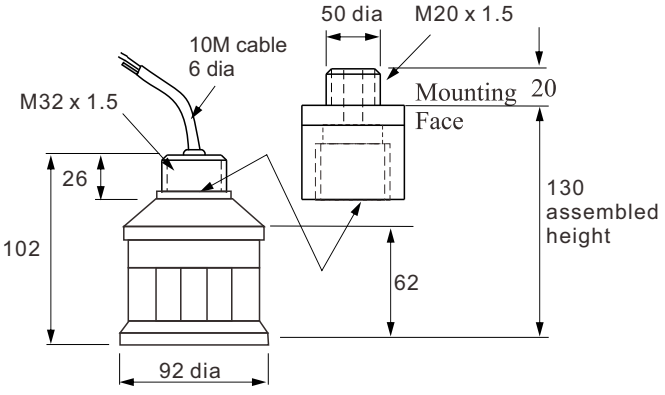
MODEL: RXM19ER



MODEL: RYTK15



MODEL: RWTK15



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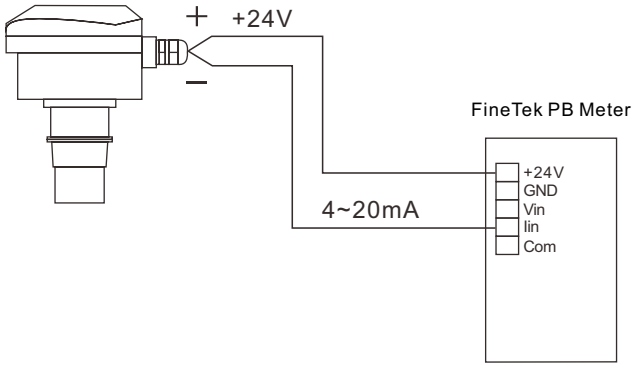
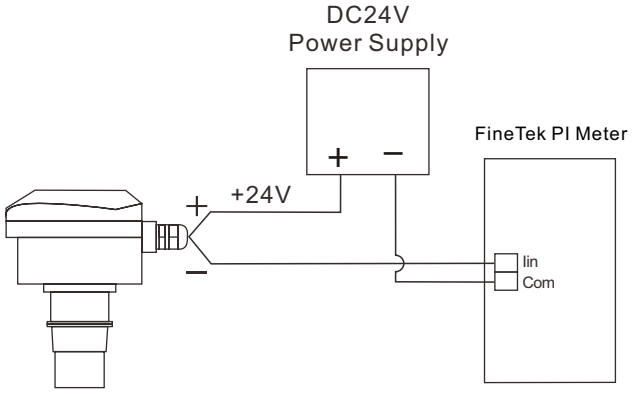
WIRING/INSTALLATION

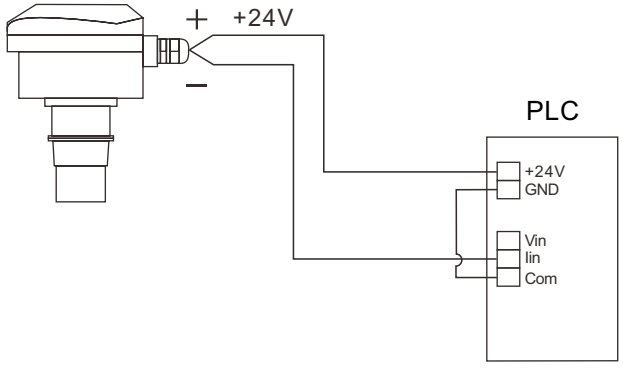
2-wires (power supplied by panel meter)



2-wires power supply (external)

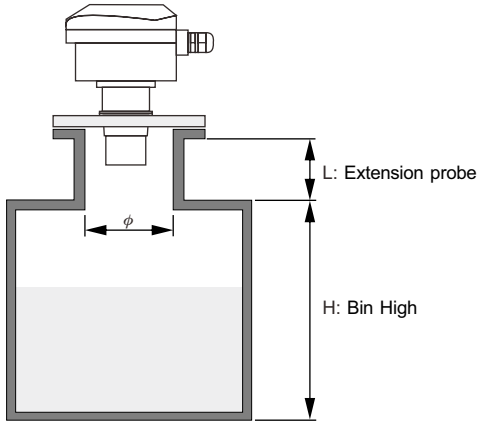


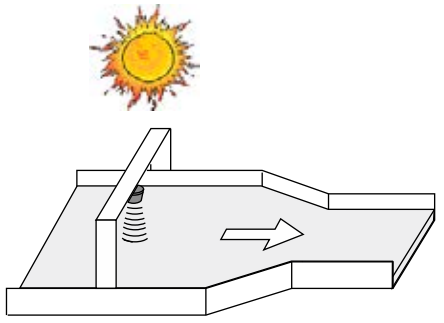
4-wire (PLC)



The ultrasonic transducer is mounted to the flange of the extension neck of the tank. Please refer to the instruction below:
Length for dead band:
Dead band has to be 150mm over extension neck.
Dead band needs to be set as 500mm if extension neck is shorter than 500mm.
Extension length:
Please refer to below table and choose the suitable probe

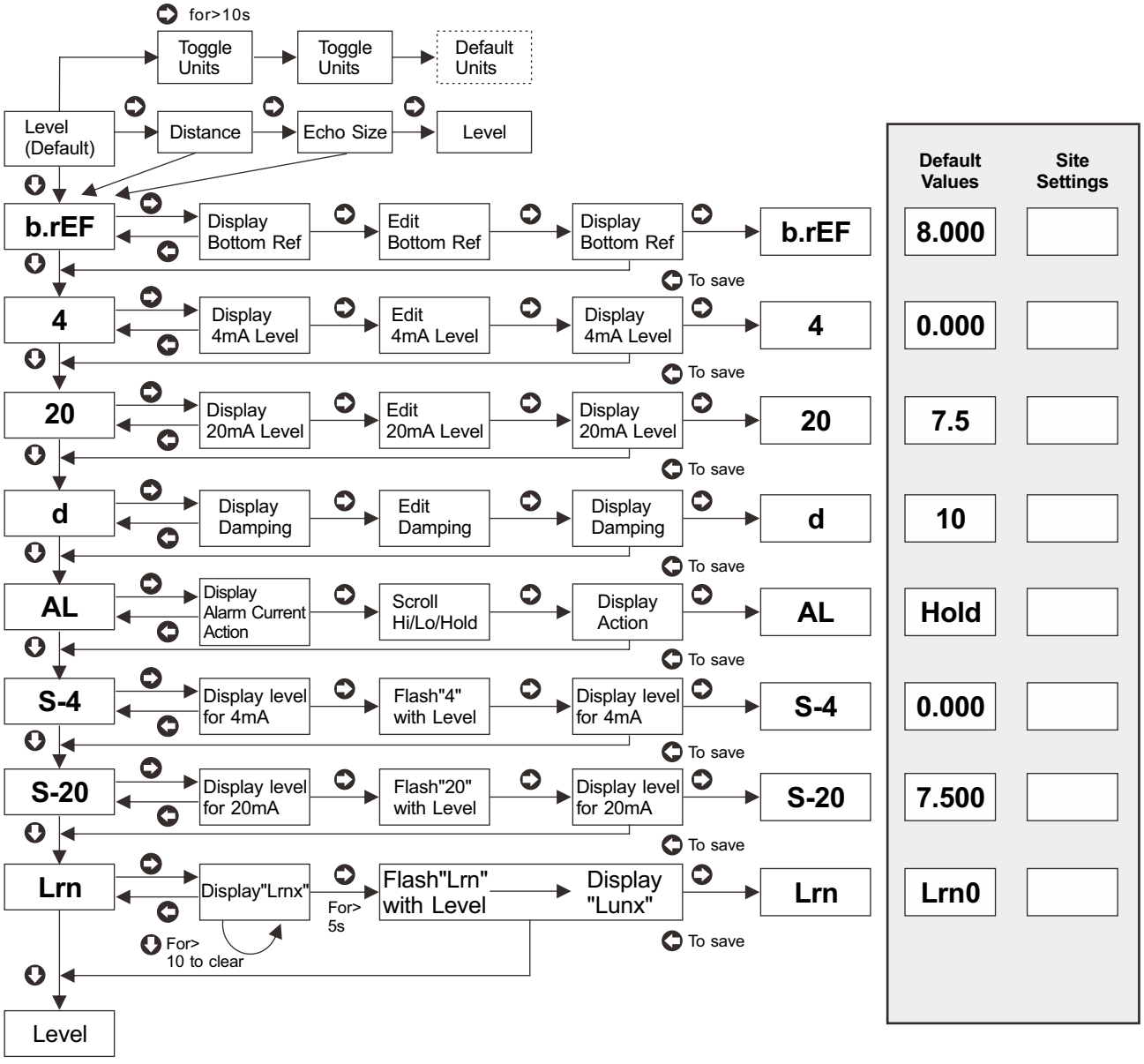
Flange size	Diameter of extension probe(ϕ)Min	Diameter of extension probe L (Max)
3"	75mm	300mm
4"	100mm	300mm
6"	150mm	400mm
8"	200mm	600mm
12"	300mm	600mm





Keep the transducer away from sunshine

SET UP PROCEDURE

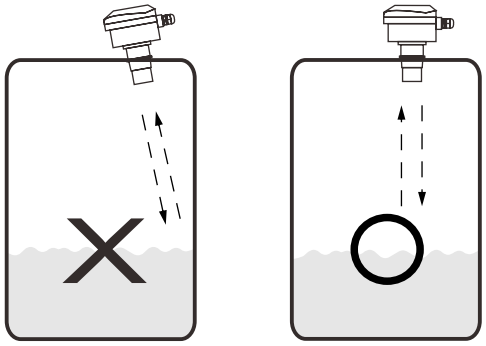


Parameter Function Statement

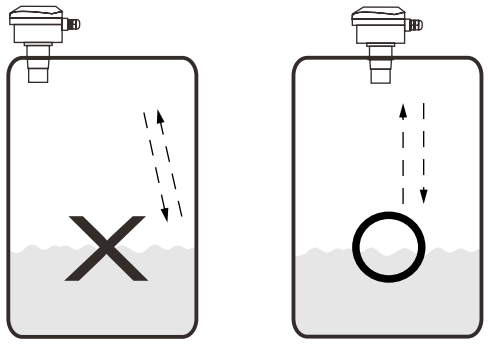
Item	Parameter	Function Statement
1	Level	Set the showing value corresponds to the level or distance
2	b.rEF	Set the bin high
3	4	Set the showing value on 4~20mA (solid, distance, volume...)
4	20	Set the showing value on 20mA (solid, distance, volume...)
5	D	Set damping time (When the value is getting big which means that the number is more stable but the responding time becomes slow)
6	AL	Set the alarming current (when it is abnormal, the output current can set as 22mA /maintenance/3.5mA)
7	S-4	Set the low point at 4mA (general is low level)
8	S-20	Set the height point at 20mA (general is high level)
9	Lrn	Exclude the obstacles(excluding the false signal reflected from obstacles)

WIRING/INSTALLATION

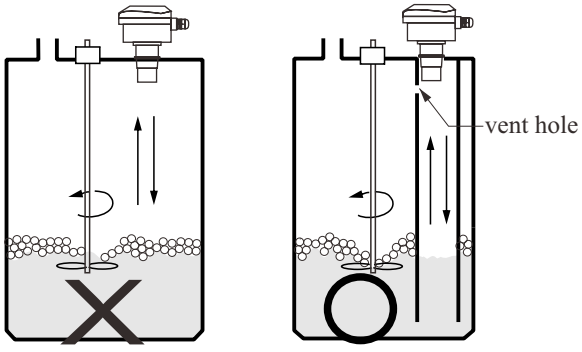
Keep the transducer perpendicular to the liquid surface.



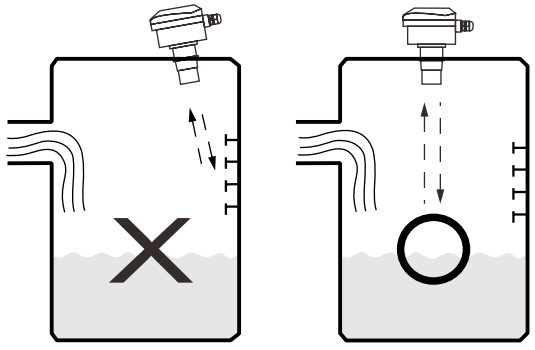
The transducer should not be mounted too close to the tank wall to avoid interference.



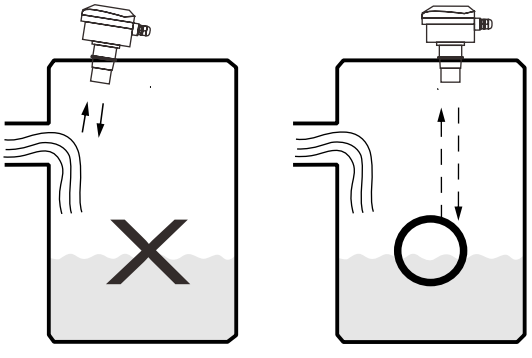
A pipe surrounding the detection path along the ultrasonic wave from emitting to receiving is Recommended. Installation can prevent false signals caused by turbulence and foam when an agitator is present. When the pipe is installed, a vent hole is required to balance the pressure difference between the inside and outside of the pipe...



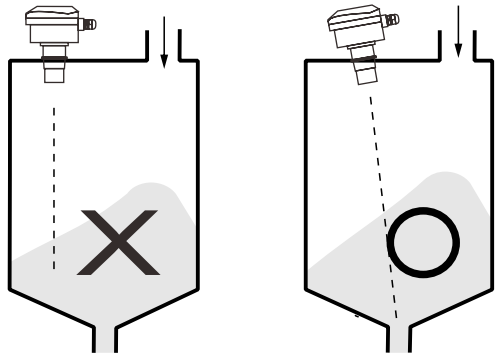
Do not mount the device close to the tank wall.



Mount the transducer away from the inlet to avoid interference with the medium.



When the user mounts the transducer on a solid tank, the transducer must not point to the outlet of tank.



MODEL NUMBER / ORDER CODE COMPARISON TABLE

Model Number	Order Code
MICROFLEX-C	EAX10000-A00B291
MICROFLEX-CER	EAX10000-B00B291
MICROFLEX-CIS	EAX1001B-C00B291
REFLEX+RXM19ER	EAX10400-D03K500
MUTLIFLEX+RWXTK15	EAX1041C-E04J200
MINIFLEX+RWXTK15	EAX1041C-F00J200

ORDER INFORMATION

⑤⑥ Type

00：Standard
04：Remote probe

⑦⑧ Certification

00：None
1B：ATEXI-Exia
1C：ATEXI-Exd

⑨ Construction

A：MICROFLEX-C
B：MICROFLEX-CER
C：MICROFLEX-CIS
D：REFLEX
E：MUTLIFLEX
F：MINIFLEX-LR

⑩⑪ Remote type of transducer

00：None
01：RYTK15
02：RXM19
03：RXM19ER
04：RWTK15

Connection

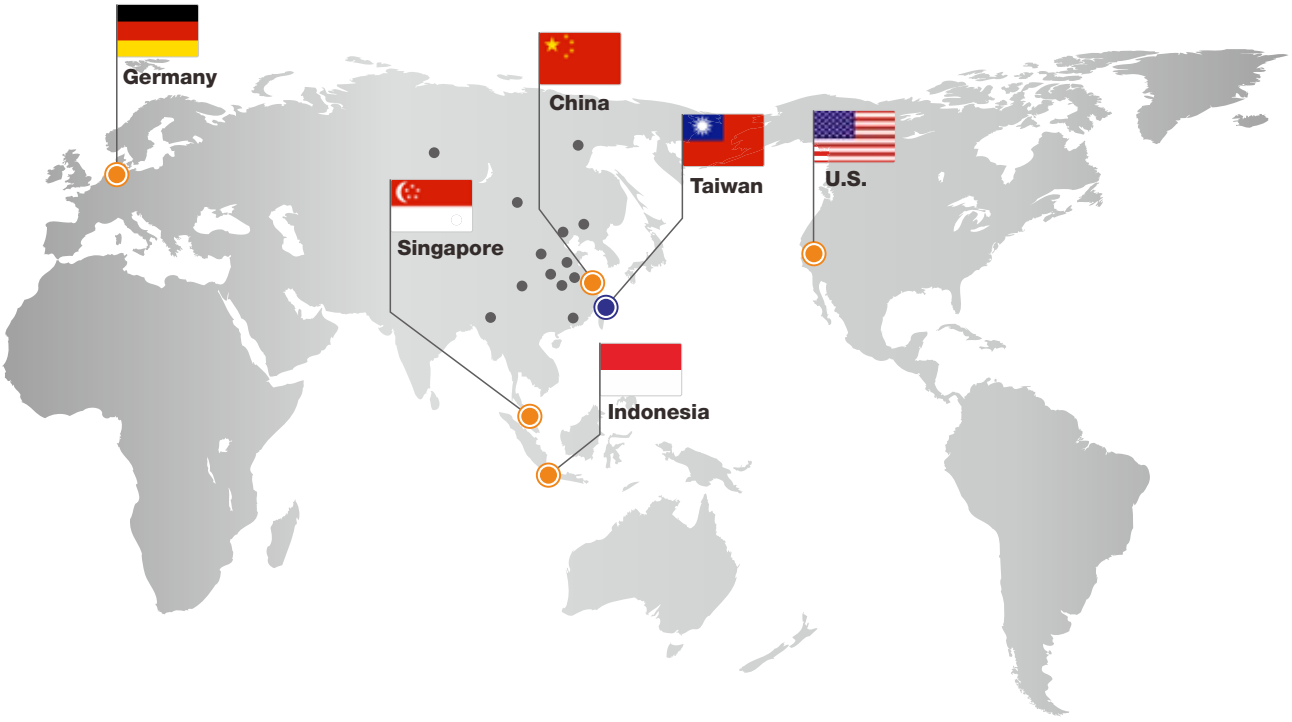
⑫⑬

B：2"
J2：M20
K5：M32

⑭⑮

00：None
07：NPT male
91：BSPT male

Global Network



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