

# PRODUCT INTRODUCTION

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## INTRODUCTION

The ultrasonic level Indicator is a low-cost, non-contact 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.

## THEORY

The 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 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  $v$  and the time period  $t$  by the formula:

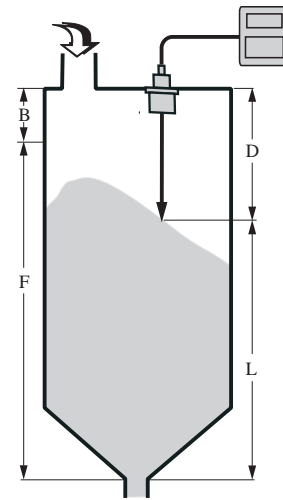
$$D = v \cdot t / 2$$

Example:

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

## FEATURES

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



B = Blanking distance

D = Distance from transducer to material surface

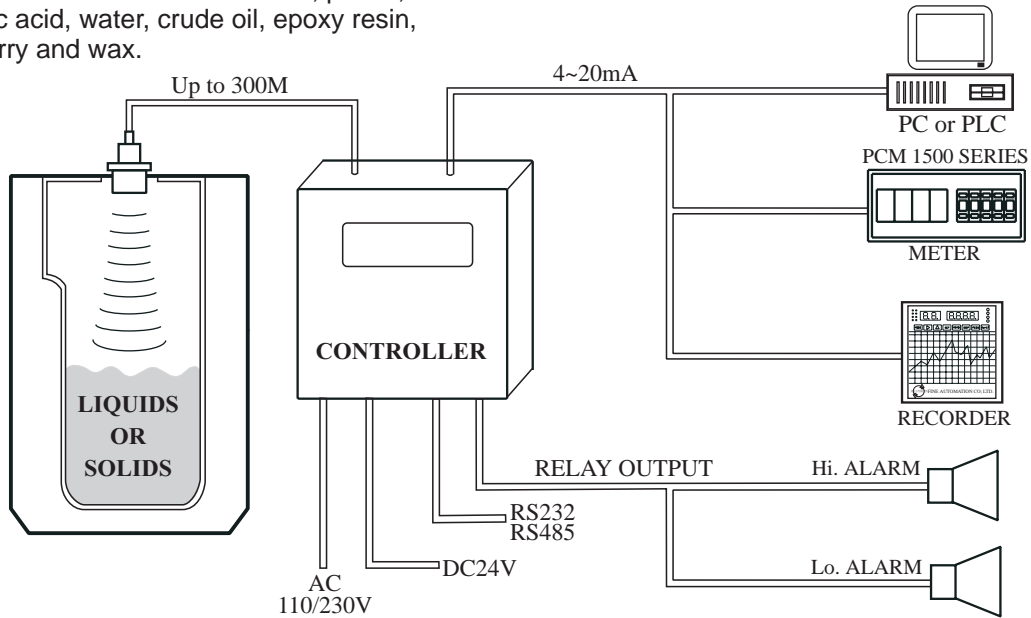
L = Height in silo

## MAIN FUNCTION

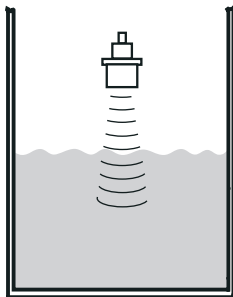
1. Level measurement (height above datum).
2. Distance measurement (distance from a datum).
3. Volume measurement.
4. Differential level measurement
5. Open channel flow measurement.
6. Pump control.

# APPLICATION FIELD

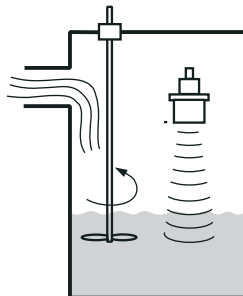
1. Sewage/waste water/tapwater treatment equipment. Such as silos, open channels, dams and wells.
2. Liquids such as edible-oils, sauces, diesel oils and beverages.
3. Chemical material such as solvent, paints, carbonic acid, water, crude oil, epoxy resin, lime slurry and wax.
4. Granular materials such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



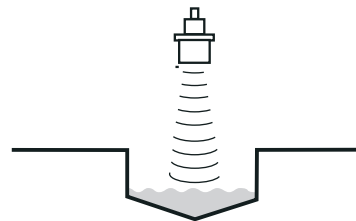
Liquid / Powder measurement



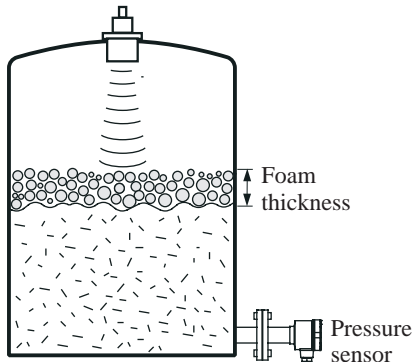
Silo with rotational aiming kit



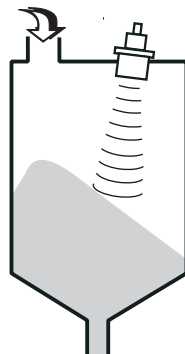
Flow measurement



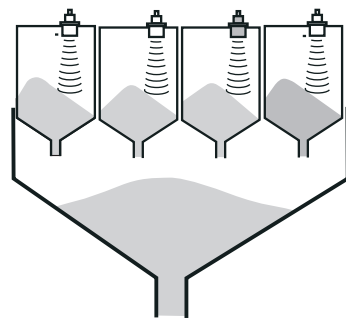
Foam thickness measurement



Measuring in agitator tank



Material Mixing



## SPECIFICATION OF CONTROLLER

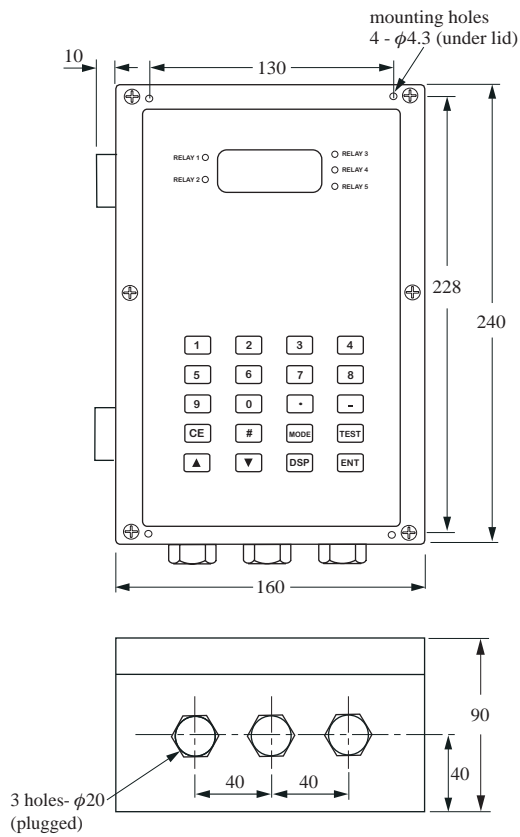
Model Spec.	ZREFLEX	ZMULTI(LIQUI)FLEX	ZMINIFLEX
Accuracy of change in level	± 0.25% of measured distance	± 0.25% of measured distance	± 1.0% of measured distance
Resolution	2mm or ± 0.1% of empty distance whichever is the greater	2mm or ± 0.1% of empty distance whichever is the greater	2mm or ± 0.1% 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 6VA 24VDC 6W, separate terminals
Relay output	5XSPDT 5A/230VAC resistive.	5XSPDT 5A/230VAC resistive.	2XSPDT 5A/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	_____
Interface	5x4 Keypad, integral membrane 4 digit security coded	5x4 Keypad, integral membrane 4 digit security coded	5 push buttons
Indication	Multiline display	LCD Module, 5 red LED's for relay status	4 digit 12mm 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	-40°C~70°C
Scan rate	Programmable-min. 30 seconds	_____	_____
Enclosure	IP65 Polycarbonate hinged lid 240hx160wx90d (mm)	IP65 Polycarbonate hinged lid 240hx160wx90d (mm)	IP65 Polycarbonate hinged lid 160hx100wx55d (mm)
Weight (kg)	1.75	1.75	0.85
Suitable material	Solid / liquid	Power / Solid liquid	liquid, slurries & pastes
Measured distance (Max.)	50M	10M   15M 10M(RZT-15)	6M
Transducer	RXV15P RXM19 RXM19ER	RXT15 RXT15P   RXT15 RZT15 RXT15P	RZT15 RZT15T

\*The ZMULTIFLEX is suitable for solid material and max. measured distance is 10M.

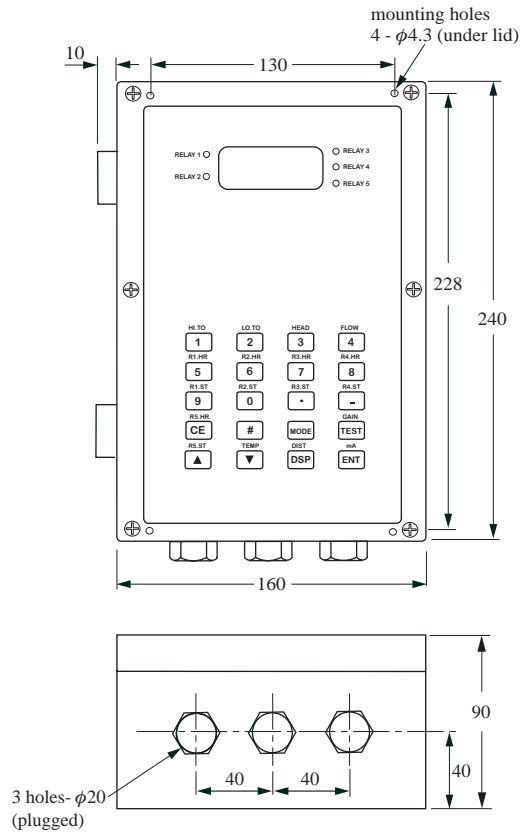
\*The ZLIQUIFLEX is suitable for liquid material and max. measured distance is 15M.

# SPECIFICATION OF CONTROLLER

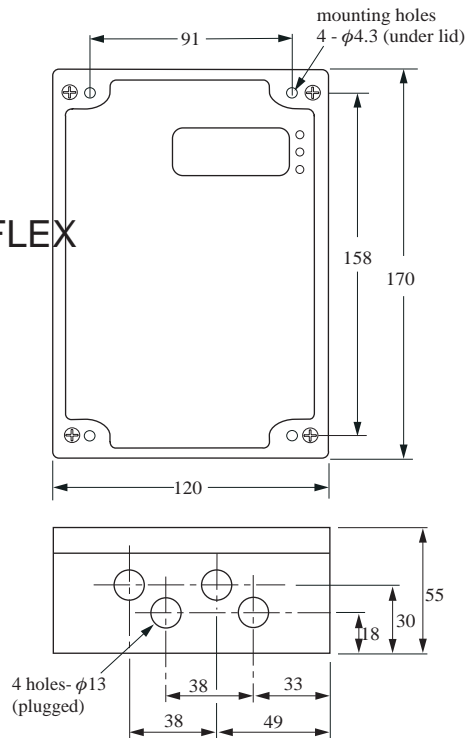
## MODEL: ZREFLEX



## MODEL: ZMULTI(LIQUI)FLEX



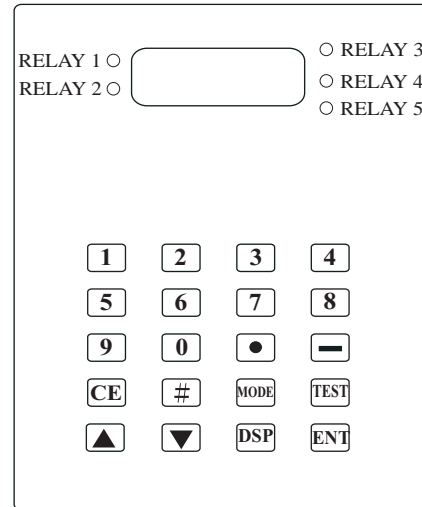
## MODEL: ZMINIFLEX



# INTEGRATED KEYPAD

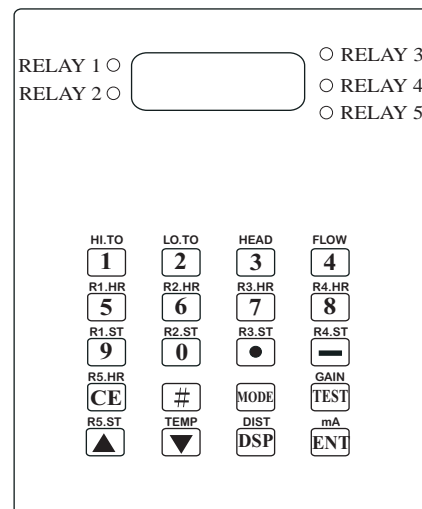
## MODEL: ZREFLEX

- 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.



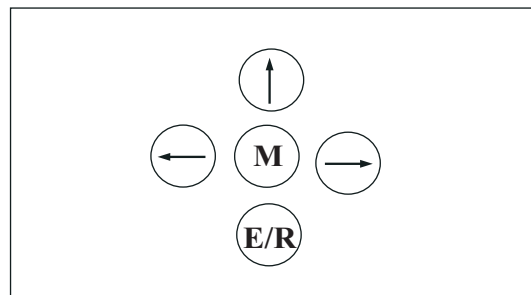
## MODEL: ZMULTI(LIQUI)FLEX

- 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: ZMINIFLEX

- M : to go from "RUN" to "Prog" To go from parameter Number to parameter value.
- E/R : 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.



## SPECIFICATION OF TRANSDUCER

Spec. \ Model	RZT15	RZT15T	RXV15 RXT15	RXV15T RXT15T	RXV15P RXT15P	RXM19 RXM19ER
Body Material	Xenoy	Xenoy	Xenoy	Xenoy	Xenoy	Polypropylene
Face Material	Polyurethane	PTFE	Polyurethane	PTFE	Polypropylene	Polyethylene
Frequency (kHz)	41.5 KHz	41.5 KHz	41.5 KHz	41.5 KHz	41.5 KHz	19 KHz 17 KHz
Beam angle	10°	10°	10°	10°	10°	10° 5°
Max. Range Liquids	10M (*2) 6M (*3)	10M (*2) 6M (*3)	15M (*2)	15M (*2)	20M (*1)	30M (*1) 50M (*1)
Max. Range Solids	—	—	10M (*2)	10M (*2)	15M (*1)	25M (*1) 40~50M (*1)
Temp.	-40°C~90°C	-40°C~90°C	-40°C~90°C	-40°C~90°C	-40°C~90°C	-20°C~60°C
Hazardous Area	EExMIIT6	EExMIIT6	EExMIIT6	EExMIIT6	EExMIIT6	No
Protection	IP68	IP68	IP68	IP68	IP68	IP65
Weight	2.0kg	2.0kg	2.0kg	2.0kg	2.0kg	2.8kg 4.8kg
Mounting	M20	M20	M20	M20	M20	M20 M32

**Note:**

\*1 used with ZREFLEX controller

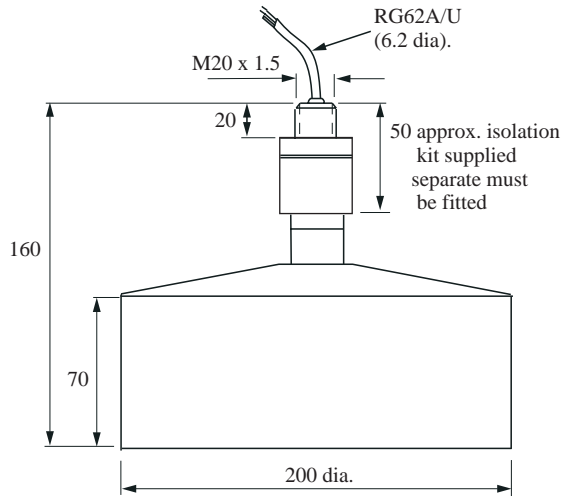
\*2 used with ZMULTI(LIQUI)FLEX controller

\*3 used with ZMINIFLEX controller

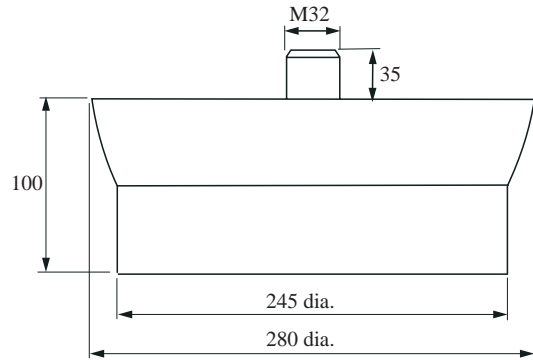
The above Max. Range are offered by base on sound velocity 340m/s at 20°C atmosphere environment.

# SPECIFICATION OF TRANSDUCER

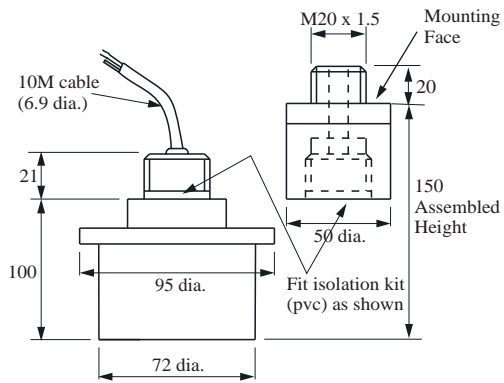
MODEL: RXM19



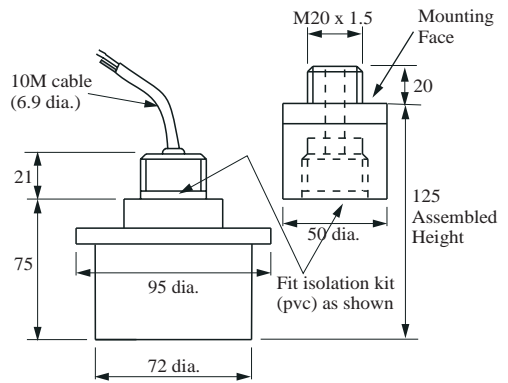
MODEL: RXM19ER



MODEL: RXT(V)15  
RXT(V)15T  
RXT(V)15P



MODEL: RZT15  
RZT15T



# ROTATIONAL AIMING KIT

MODEL: ULB-0010 / ULB-0020

Body Material: PVC or PP

Swinging angle: 20°

