

ULTRASONIC LEVEL METERS

▶▶ Transmitter

HUT-2000 Series
HUT-1000 Series

▶▶ Sensor

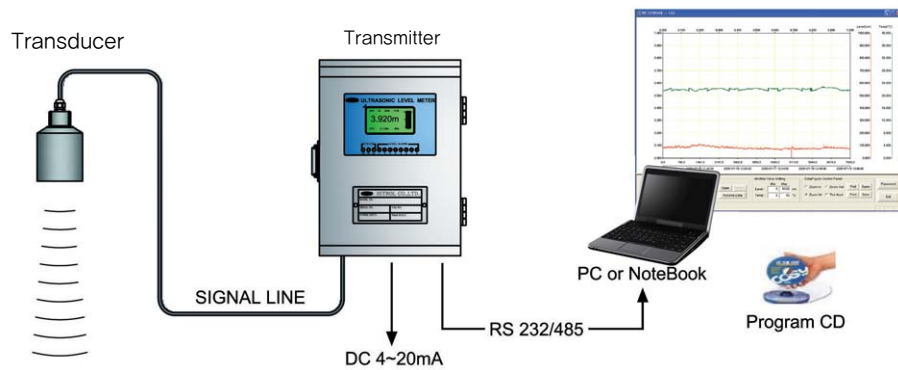
HUL-2000 Series
HUL-1000 Series



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INTRODUCTION

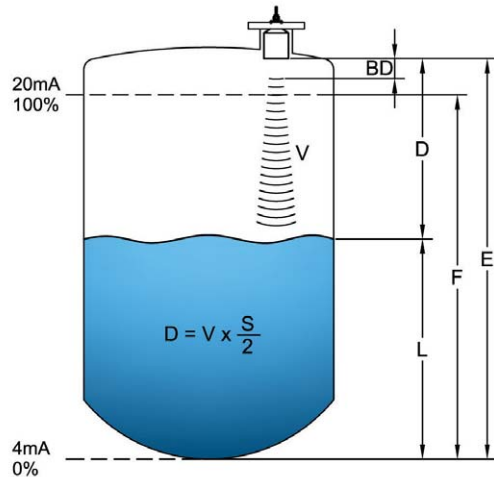
The ultrasonic level meter is non-contact instrument designed by ultrasonic technology to measure the level of liquids with accurate and stable. Ultrasonic level meter consists of sensor and transmitter. Transmitter has ultrasound emit and receiving status display that may indicate operating condition and built-in max. 400 days process values data logging function.



OPERATING PRINCIPLE

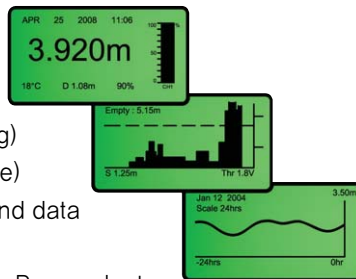
Ultrasonic level meter mounted top of the tank and emit ultrasound pulse to measuring medium. Ultrasound pulse reach to the surface of measuring medium and reflected sound return back to sensor. These travel time calculated and converted to the reading level unit.

- BD : Dead zone
- E : Tank height
- F : SPAN
- D : Distance
- L : Level(E-D)
- V : Speed of Ultrasound(m/s)
- S : Ultrasound travel time(sec)



FEATURE

- Max. 15m measuring range
- Continuous measurement
- Visual threshold adjustment
- ASF(Automatic Signal Filtering)
- Narrow beam angle (4 degree)
- 10,000 points data logging and data trend monitoring
- Designed logging for Nuclear, Power plant applications
- Seismic Qualification, Environmental Qualification, EMI/RFI, Software V&V certified(Class-1E)



APPLICATION

- Nuclear/Thermal/Hydro Power Plants
- Water/Sewage Treatment
- Industrial Process Tanks
- Chemical Tank
- Steel / Refinery
- River/Dam



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❏ SPECIFICATION

TECHNICAL DATA

TRANSMITTER		
TYPE	HUT-SERIES	
	HUT-1000N/T	HUT-2000N/T/S
Measuring Range	Max. 15m	Max. 15m
Channel	1ch.	1Ch., 2ch.
Resolution	10mm	1mm
Accuracy	±0.25% of F.S	±0.25% of F.S
Operating Temp.	-20~+60°C	-30~+70°C
Output	Current Output	DC 4~20mA, Load 600Ω
	Relay Output	4-SPDT
	Interface	RS-232
Display	Level, Distance, Temperature, %	Level, Distance, Temperature, %, Time
Screen(SCR)	Measure Value	Measure Value, Echo Profile, Data Trend
Enclosure	IP65, NEMA 4	IP 65, NEMA 4
Material	Stainless Steel	Stainless Steel, ABS
Data Logging	-	Max. 400days
Power Supply	85~260VAC	90~240VAC or +16~+32VDC
Mounting Method	Wall	Wall(Std.), PIPE

SENSOR				
TYPE	HUL-SERIES			
	HUL-1100N/T	HUL-1200N/T	HUL-2100N/T/S	HUL-2200N/T/S
Measuring Range	0.4~8m	0.6~15m	0.3~8m	0.5~15m
Beam Angle	Max. 12 degree		Max. 4 degree	
Frequency	50kHz	41kHz	53kHz	47kHz
Operating Temp.	-30~+80°C		-30~+70°C	
Material	Stainless Steel		ABS(Std.), Others	
Mounting Method	Flange(4" 150#)		PF 1"(M) Screw, Flange	
Enclosure	IP 68, NEMA 6P		IP 68, NEMA 6P	
Cable Length	Max. 100m		Max. 100m	

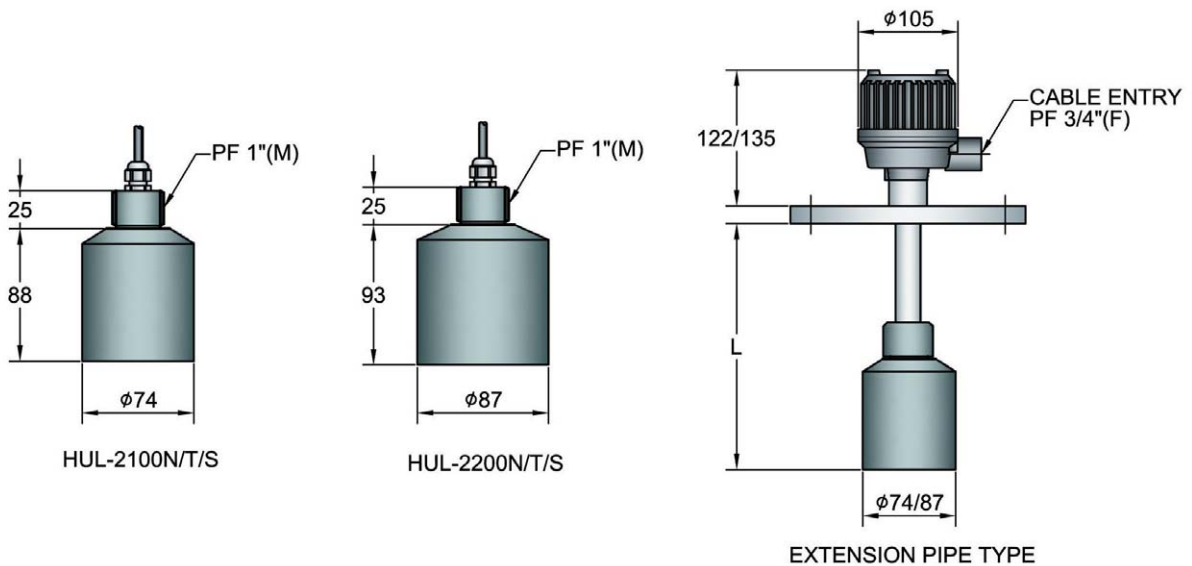
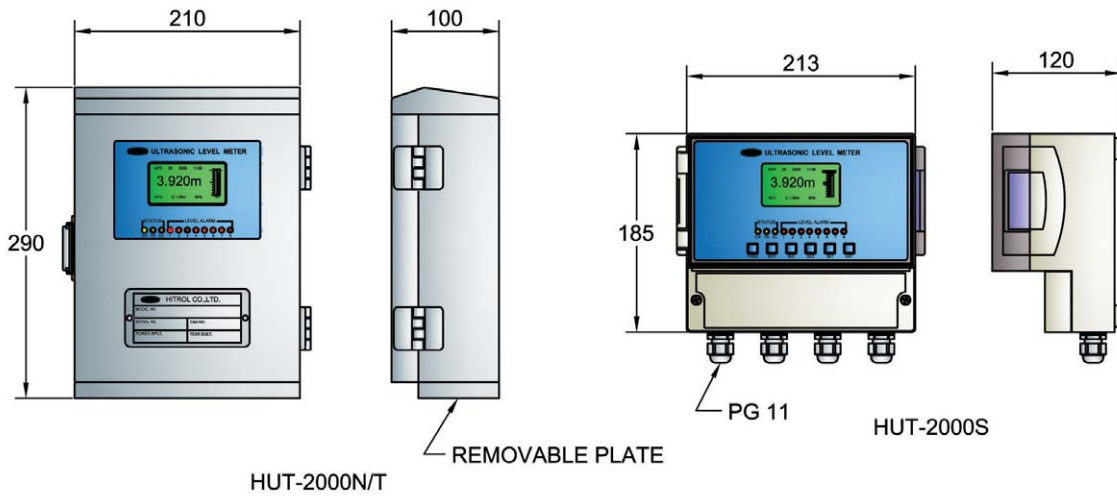
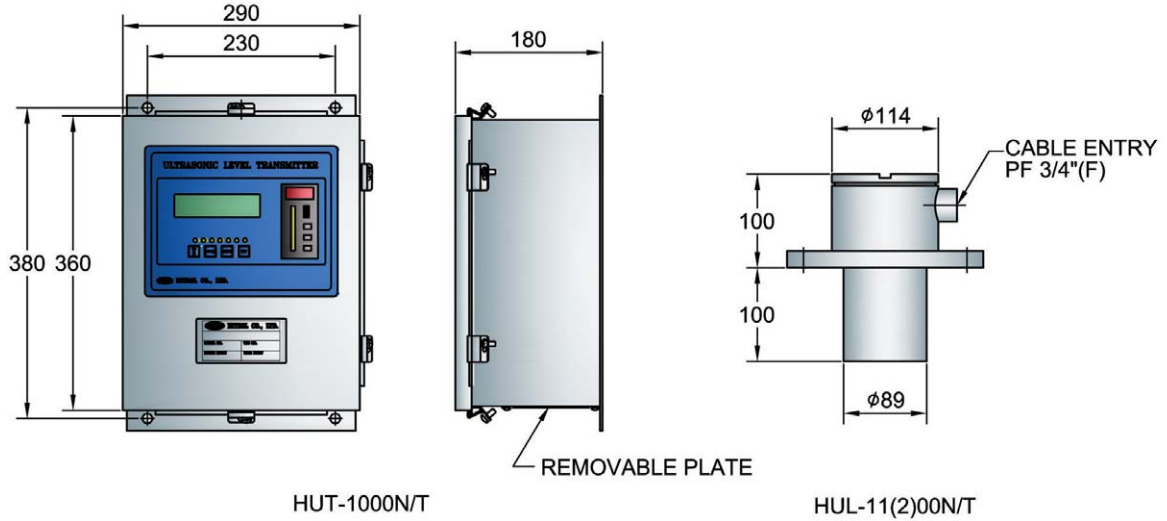
Description	Feature	Remark
HUT-1000N + HUL-1100N/1200N	CLASS-1E Seismic Category I, II, III	Seismic Qualification, Environmental Qualification, Software V&V EMI&RFI
HUL-1000T + HUL-1100T/1200T	Seismic Category I, II, III	Seismic Qualification, EMI&RFI
HUT-2000N + HUL-2100N/2200N	Class-1E Seismic Category I, II, III	Seismic Qualification, Environmental Qualification, Software V&V EMI&RFI
HUT-2000T + HUL-2100T/2200T	Seismic Category I, II, III	Seismic Qualification, EMI&RFI
HUT-2000S + HUL-2100S/2200S	Seismic Category III	EMI&RFI



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DIMENSION





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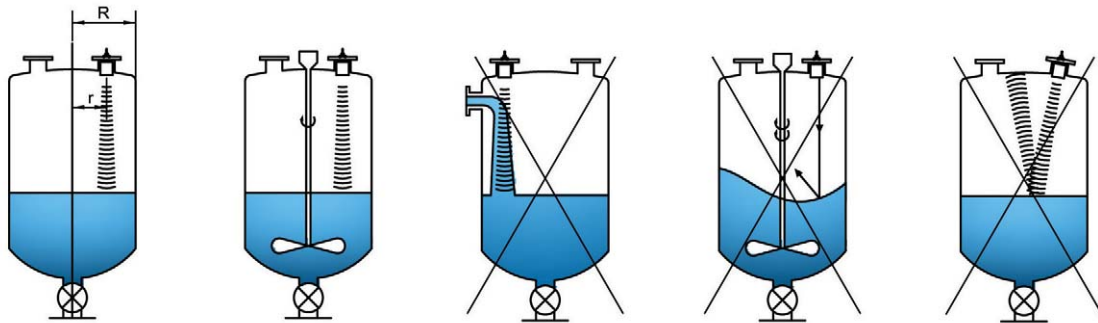


INSTALLATION

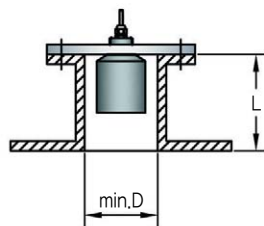
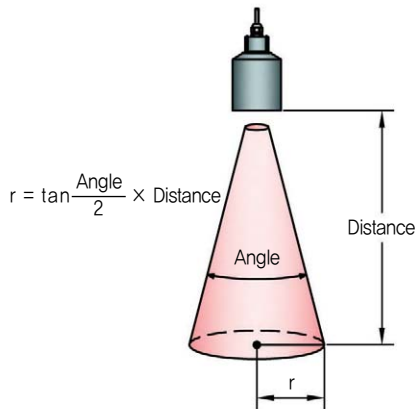
INSTALLATION

Before install ultrasonic level meter, it should be protected from mechanical damage during transportation and should be free from physical forces. Especially, transducer surface where is emitting and receiving ultrasound parts should be wrap in sponge or soft packing materials to protection from physical damage during transportation.

Sensor should be mounted in connection 1"PF thread or flange, position of sensor recommended to be locate between $r=0.3R$ and $0.5R$. Especially, sensor should be mounted where ultrasound may not affected from obstacles. Avoid agitator or extruded pipe below sensor, near fluid in-flow line, bubbles or solids on the surface of fluid, and where fumes and vapours gas exist.

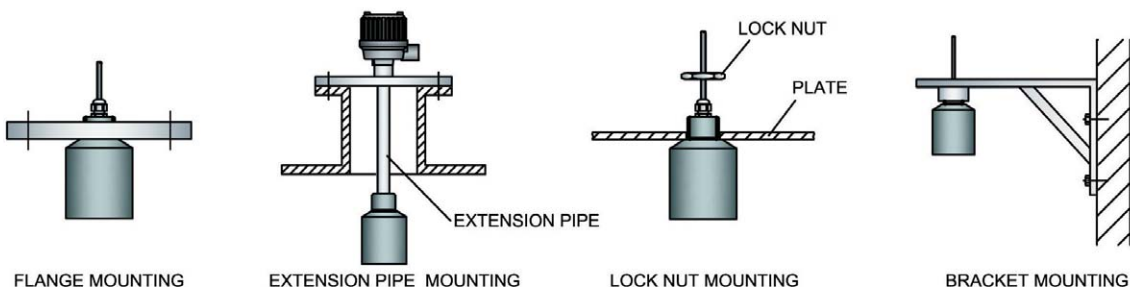


Before mount ultrasonic sensor, confirm the sizes of stand off pipe as below dimensions so that can be avoid ultrasonic beam not affect by wall of pipe and it can be emitted without any obstacles.



Model	D(mm)	L(mm)
HUL-1100N/T	100	< 200
HUL-1200N/T	100	< 200
HUL-2100N/T/S	80	< 200
HUL-2200N/T/S	100	< 200

Ultrasonic sensor can be mounted various ways by connection size PF1"(M). Extension pipe type can be mounted right position by avoid obstacles, Lock nut and bracket also available.





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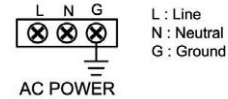
ELECTRICAL CONNECTION FOR HUL-11(2)00N/T-1000N/T

Power and wiring

Power connection

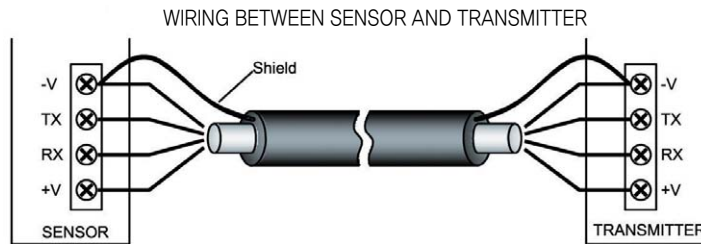
Power noise filtered by built-in EMI filter and isolation switch of 15A circuit breaker should be always positioned near the transmitter.

Power source is 85-260VAC, 50-60Hz. Operating controller external power connected to appropriate terminal block.



Sensor connection

4 wire (4C x 20AWG) cable used for connection between sensor T/B and transmitter T/B.



Output connection

Analogue connection

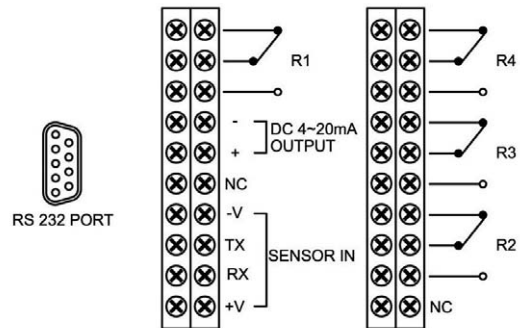
Level transmitter default displayed measuring values transmitted by DC4-20mA to external instruments for recording or control, 2 wire(unloaded +Vdc) connection.

Serial communication port connection

Serial communication(RS232) user can connect to the communication port.

Relay connection

Ultrasonic level meter has max. 4 relays output and setting alarm mode available.



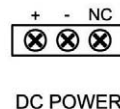
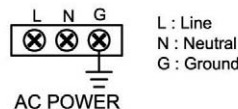
ELECTRICAL CONNECTION FOR HUL-21(2)00N/T/S and HUT-2000N/T/S

Power and wiring

Power connection

Power noise filtered by built-in EMI filter and isolation switch of 15A circuit breaker should be always positioned near the transmitter.

Power source is 90-240VAC, 50-60Hz or +16-+32VDC. Operating controller external power connected to appropriate terminal block.





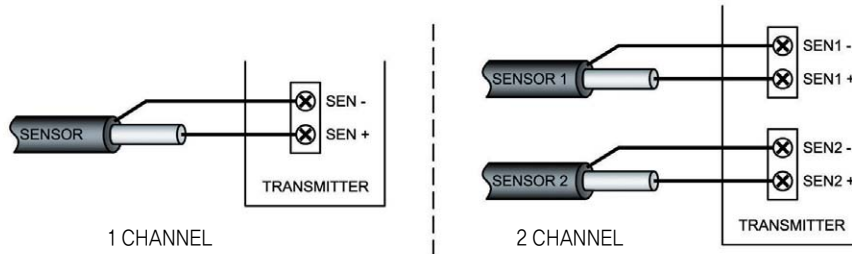
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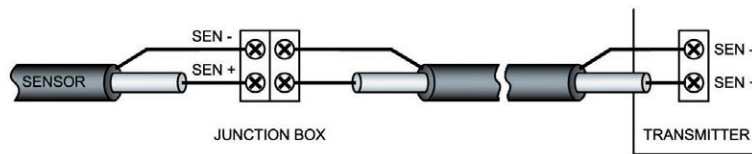
• Sensor connection

2 wire (RG58 or 62AU) from sensor connected directly to the transmitter T/B or connect to the transmitter T/B through the junction box.

* SEN + = coaxial core cable
* SEN - = coaxial shield cable **WIRING BETWEEN SENSOR AND TRANSMITTER**



WIRING, WITH EXTENDED SENSOR SIGNAL CABLE

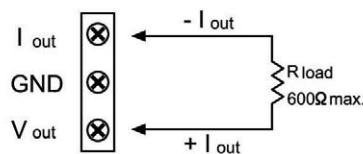


• Output connection

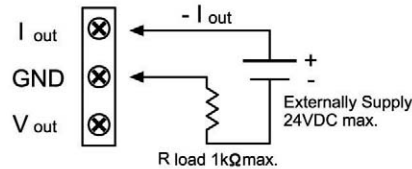
- Analogue connection

Level transmitter default displayed measuring values transmitted by DC4~20mA to external instruments for recording or control.

Generally, field instruments are use of 3(4)wire(loading +Vdc) or 2 wire(unloading +Vdc), appropriate external indicators input scheme should be selected.



INTERNALLY POWER(STD)



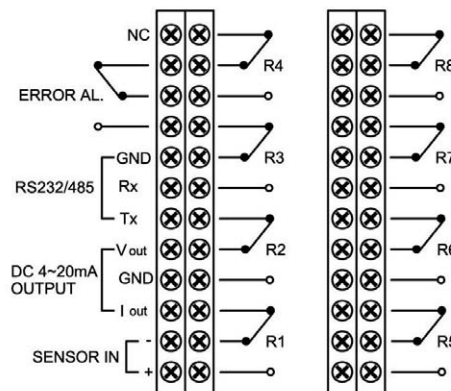
EXTERNALLY(LOOP) POWER

- Serial communication port connection

Serial communication(RS232/485) user can be connect to the communication port.

- Relay connection

Ultrasonic level meter has max. 8 relays output and setting alarm mode available.



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ORDER CODE

■ TWO-PART SYSTEM

SENSOR

HUL - 1 00

TYPE
N : Class-1E, Seismic Category I, II, III
T : Seismic Category I, II, III

MEASURING RANGE
1 : 8m
2 : 15m

TRANSMITTER

HUT - 1000

TYPE
N : Class-1E, Seismic Category I, II, III
T : Seismic Category I, II, III

SENSOR

HUL - 2 00 -

MATERIAL
O : ABS
S : 316 SS
T : Teflon

TYPE
N : Class-1E, Seismic Category I, II, III
T : Seismic Category I, II, III
S : Industrial

MEASURING RANGE
1 : 8m
2 : 15m

TRANSMITTER

HUT - 2 0 0 0 - -

BACKUP BATTERY
E0 : None
E1 : 1hr(Only DC Power)

CHANNEL
D0 : 1-Channel
D1 : 2-Channel

POWER
C0 : 90~240VAC
C1 : +16~+32VDC

RELAY
B0 : None
B1 : 4-SPDT
B2 : 8-SPDT
B3 : 4-DPDT

SIGNAL OUTPUT / INTERFACE
A0 : Display Only
A1 : Display +4~20mA
A2 : Display +4~20mA / RS-232
A3 : Display +4~20mA / RS-485

TYPE
N : Class-1E, Seismic Category I, II, III
T : Seismic Category I, II, III
S : Industrial



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