



Product Brochure

Ultrasonic Differential Level Transmitter

SUP - WSU500

**Exclusive Distributor
in Türkiye**

MV Endüstriyel Ölçüm Cihazları Anonim Şirketi

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Brochure

Ultrasonic Differential Level Transmitter SUP- WSU500

The ultrasonic level differential transmitter is designed to measure the height difference between the liquid or solid levels in two separate containers.

It is most commonly used at the influent of wastewater treatment plants to measure the water level difference before and after coarse and fine screens. The measured level difference is used to activate the raking mechanism of the trash removal machine. It is also installed upstream and downstream of gates to measure the water level difference, helping determine the optimal gate opening time. The devices are referred to as “dual-channel level transmitter.” It does not measure the level difference but instead measures the water levels of two liquid levels independently, outputting two separate (4–20) mA signals corresponding to the levels of the respective tanks.

Features

- Non-contact measurement: Resistant to entanglement, clogging, and corrosion; maintenance-free.
- Easy access to data: wireless communication is available; data is accessible anytime via the mobile app.
- LCD display with capacitive keys: flexible and user-friendly operation.
- Self-diagnostic technology: Enables real-time fault detection for easy troubleshooting.
- Multiple algorithm options: Enhances adaptability to various working conditions.
- Fast response: Measurement values update quickly, with a response time as fast as 1 second.
- Automatic temperature compensation: Compensates for changes in the speed of sound due to temperature, improving measurement accuracy.
- Echo curve display: Allows real-time monitoring of echo signal strength, aiding in field calibration.
- User-friendly TVT threshold curve design: Quickly filters out interference signals for more stable measurements.



**Ultrasonic Differential Level
Transmitter**

Principle

The ultrasonic differential level transmitter emits ultrasonic pulses from the transducer toward the liquid surface. When the sound waves encounter an interface with a different acoustic impedance (such as the liquid–air boundary), they are reflected back to the transducer. The instrument measures the round-trip travel time of the ultrasonic signal and, based on the speed of sound, calculates the distance between the transducer and the liquid surface, thereby determining the level.

By independently measuring the liquid levels at upstream and downstream locations—or at two different points—the instrument accurately calculates the level difference.

Parameters

Parameters		
Measured variables	Solid/Liquid	
Measuring range	(0~5)m/(0~10)m/(0~15)m	
Blocking distance	≤0.3 m (5m range) ≤ 0.4 m (10 m range) ≤ 0.5 m (1.5 m range)	
Accuracy	0.5% FS	
Resolution	1mm or 0.1% FS (whichever is greater)	
Protection level	Host: IP65 Sensor: IP6 8	
Output		
Transmitter output	Isolated, 2 channels (4 ~ 20) mA, maximum load 500Ω, output accuracy ±0.2%FS	
Alarm output	4- channel SPST, capacity 250VAC, 3A	
Communication output	Isolated RS485, Modbus-RTU	
Electrical specification		
Power supply	(100 ~ 240)VAC , 50/60Hz (18 ~ 28)VDC	
Electrical interface	M20*1.5 cable gland	
Power consumption	220VAC	Maximum power consumption: 7.5W
	24VDC	No relays, no transmitter outputs: maximum power consumption 3W
		No relays, with transmitter output: maximum power consumption 3.7W

	Relay fully open, with transmitter output: Maximum power consumption 4.1W
Process conditions	
Process pressure	0.3MPa
Environmental conditions	
Operating temperature	Main unit: (-20 ~ 60)°C Probe: (-20 ~ 80)°C
Storage temperature	(-20 ~ 80)°C
Humidity	10%RH~85%RH

Electrical Connection

(1) Wiring

For the ultrasonic level transmitter, refer to the following steps:

For ultrasonic level wiring, refer to the following steps:

- (1) Open the outer cover.
- (2) Insert the cable into the cable gland.
- (3) Insert the probe cable into the host cable gland.

Note: The wiring connecting the remote sensor and host unit cannot share the same conduit with the power lines of 220VAC or 380VAC. It must be at least 50cm away from the 220VAC power line and at least 100cm away from the 380VAC power line. If sharing the same conduit or pipe is unavoidable during onsite installation, then the connecting wire between the sensor and host unit is advised to be coated with a metal pipe for shielding. Besides, all sections running close to the AC lines should be kept inside the properly grounded metal pipe.

(4) Refer to 5.2 for terminal block instructions to connect the cables.

(5) Close the housing cover.

(6) Turn on the power.

Power

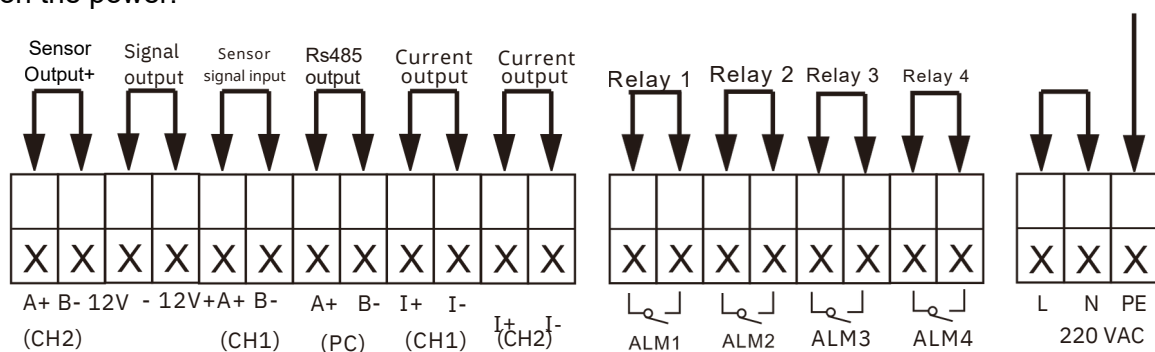


Fig.1 220VAC power supply terminal diagram

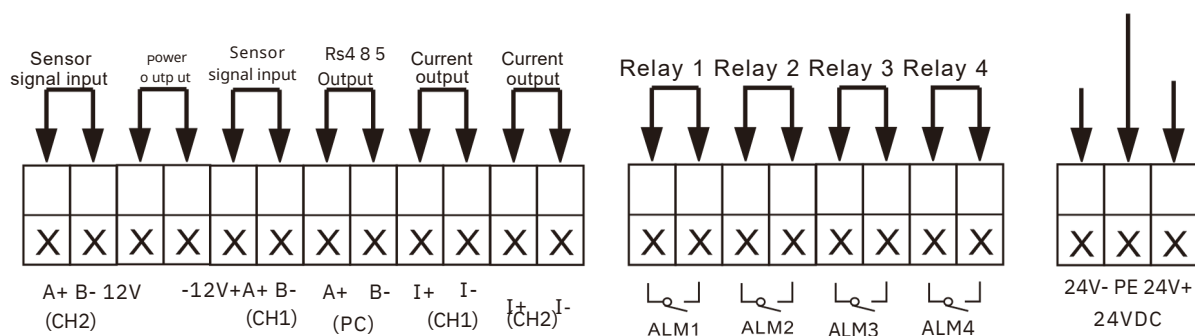


Fig.2 4VDC power supply terminal diagram

Table 1 Terminal definition

Terminal	Symbol	Definition
Power supply	L	220VAC phase line terminal / 24VDC power supply terminal (positive)
	N	220VAC neutral terminal / 24VDC power supply terminal
	PE	Grounding
Alarm output	ALM1	Alarm relay 1
	ALM2	Alarm relay 2
	ALM3	Alarm relay 3
	ALM4	Alarm relay 4
Current output	(CH1)I+	(4~20) mA current output 1+
	(CH1)I-	(4~20) mA current output 1-
	(CH2)I+	(4~20) mA current output 2+
	(CH2)I-	(4~20) mA current output 2-
RS485 output	A+	Instrument RS485 communication output A
	B-	Instrument RS485 communication output B
Sensor signal input	(CH1)A+	Connect to sensor 1 RS485 signal output A
	(CH1)B-	Connect to sensor 1 RS485 signal output B
	(CH2)A+	Connect to sensor 2 RS485 signal output A
	(CH2)B-	Connect to sensor 2 RS485 signal output B
Power distribution output	12V-	Sensor power supply -
	12V+	Sensor power supply +

(2) Post-Connection Check

Table 2 Check after the connection

Inspection items	Result
Are the cables or instruments intact (visual inspection)?	☐
Is the terminal assignment correct?	☐
Is the supply voltage consistent with the nameplate voltage?	☐
Has the cable gland been tightened?	☐
Are all housings installed and tightened?	☐
After powering on, does the display show a value?	☐

Structure and Dimensions

(1) Structure

The host unit and the sensor are mounted separately, and are connected by the cable.

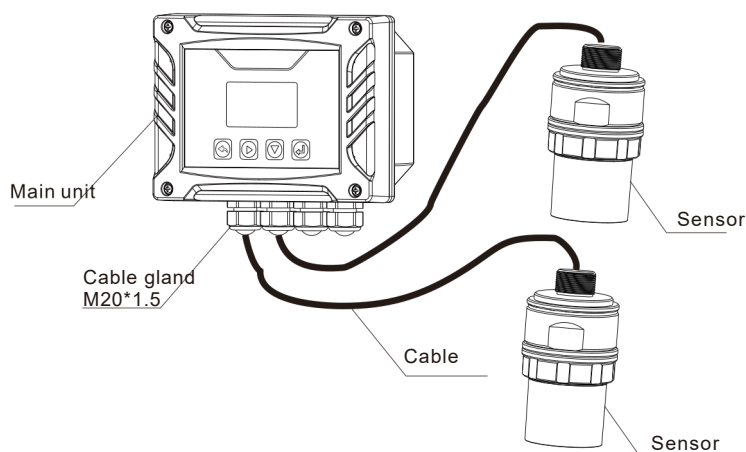


Fig.3 Structure diagram

(2) Main Unit Dimensions

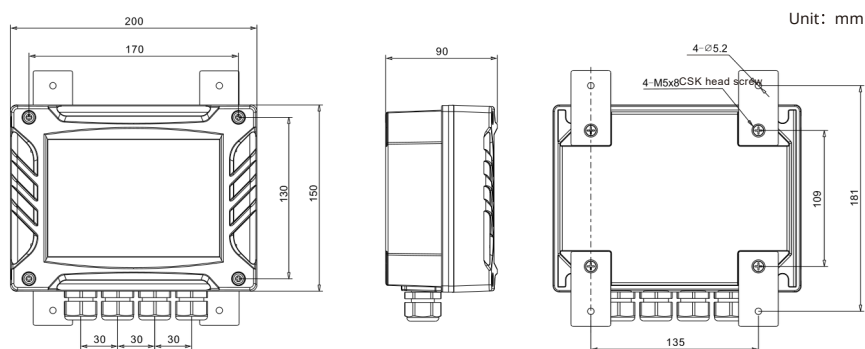


Fig.4 Main unit dimensions (unit: mm)

(3) Sensor Dimensions

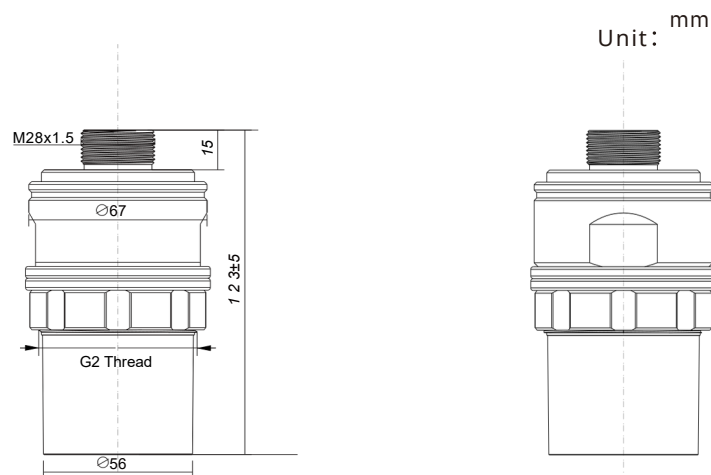


Fig.5 5/10m ultrasonic sensor dimensions (unit: mm)

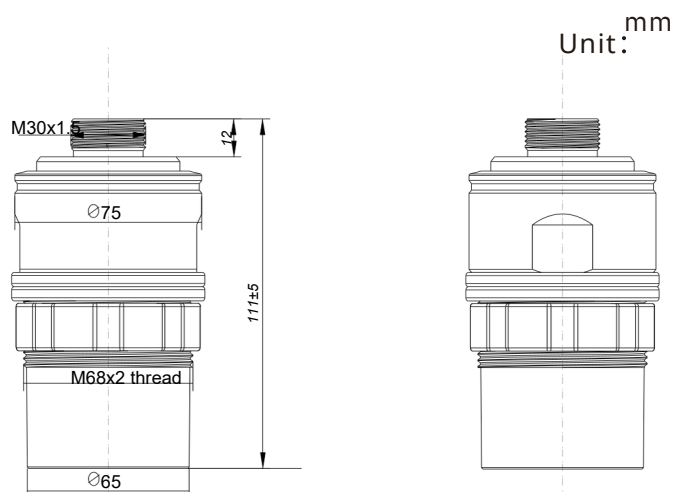


Fig.6 15m ultrasonic sensor dimensions (unit: mm)

Ordering code

SUP-WSU500						Description
Measuring range and process connection	C					5m, G2 thread
	D					10m, G2 thread
	V					15m, M68×2 thread
	X					others
Probe material		NS				ABS plastic
Accuracy			K			Level 0.5
Output and power supply				2A		2 channels (4–20) mA, 24 VDC
				2W		2 channels (4–20) mA + 4 SPST relays, 24 VDC

	2E			2 channels (4–20) mA + RS485, 24 VDC
	2X			2 channels (4–20) mA + 4 SPST relays + RS485, 24 VDC
	2B			2 channels (4–20) mA, 220 VAC
	2Y			2 channels (4–20) mA + 4 SPST relays, 220 VAC
	2F			2 channels (4–20) mA + RS485, 220 VAC
	2Z			2 channels (4–20) mA + 4 SPST relays + RS485, 220 VAC
	2N			2 channels (4–20) mA + 4G, 24 VDC
	2P			2 channels (4–20) mA + 4G + 4 SPST relays, 24 VDC
	2Q			2 channels (4–20) mA + 4G + RS485, 24 VDC
	2R			2 channels (4–20) mA + 4G + 4 SPST relays + RS485, 24 VDC
	2S			2 channels (4–20) mA + 4G, 220 VAC
	2T			2 channels (4–20) mA + 4G + 4 SPST relays, 220 VAC
	2U			2 channels (4–20) mA + 4G + RS485, 220 VAC
	2V			2 channels (4–20) mA + 4G + 4 SPST relays + RS485, 220 VAC
	XX			others
Electrical interfaces, housing material and protection level		WE		M20×1.5 cable plug, ABS plastic, IP65
Probe cable length			5A	10m×2
			6A	15m×2

	7A		20m×2
	8A		30m×2
	XX		others
Accessories	EA		L-shaped stainless steel mounting bracket, 0.8m
	RA		HG20539 PN3 DN65 PPH
	RB		HG20539 PN3 DN80 PPH
	RC		HG20539 PN3 DN100 PPH
	RD		HG20539 PN3 DN150 PPH
	RE		HG20539 PN3 DN200 PPH