ISEN-2099/2099B
Submersible level transmitter

Liquid level transmitter adopts imported sensor pressure sensitive element, uses computer laser resistance adjustment for temperature compensation, and adopts integrated junction box design. It has special wiring terminals and digital display, and is easyto install, calibrate and maintain. This series of products are widelyused to measure the liquid level height and are suitable for all occasions, all-weather environments and various corrosive fluids.

Product Name

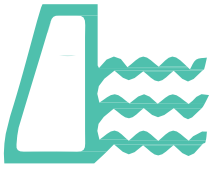
A varietyof range options; digitalpressure display; easyzeropoint and range debugging; reverse polarityprotection and current limiting protection; lightning and impact resistance; intrinsicsafetyand explosion-proof; small size, beautiful appearance, high cost performance; high precision, high stabilityand high reliability.

Working Principle

The working principle of the submersible level transmitter is based on the principle that the static pressure of the liquid is proportional to the height of the liquid. The static pressure is converted into an electrical signal byusing the piezoresistive effect of diffused silicon or ceramic sensitive elements. This process includes introducing the pressure of the liquid into the positive pressure cavityof the sensor, and connecting the atmospheric pressure on the liquid surface to the negative pressure cavityof the sensor to offset the atmospheric pressure on the back of the sensor, so that the pressure measured bythe sensor is the densityof the liquid multiplied bythe acceleration of gravitymultiplied bythe depth of the liquid. Bymeasuring this pressure, the depth of the liquid level can be obtained. Afte r temperature compensation and linear correction, this electrical signal is converted into a standard 4-20mA current signal output.

Application Field

This series of products is suitable for various enterprises and institutions such as petroleum, water conservancy, chemical industry, metallurgy, electricity, light industry, scientific research, and environmental protection. It can measure the liquid level height and is suitable for all occasions, all-weather environments, and various corrosive fluids. Specific application scenarios: Petrochemical: Submersible level transmitters are used to monitor the liquid level measurement of oil pools, oil tanks, etc.; sewage treatment: commonlyused for drinking water systems, sewage treatment plants, urban water supplyand drainage systems, reservoirs, rivers, etc.; agricultural irrigation: used to monitor the water level of irrigation pools, canals, etc., to achieve irrigation; water wells, geothermal wells and mines: used in the field of underground resource exploitation, accuratelymeasure the liquid level in the well, and can prevent water seepage accidents and ensure the safetyof miners.



Rivers and lakes

Fire water tanks

Deep pit wells

Acid and alkali tanks

Product Line

1 ISEN-2099 Digital display thread type

2 ISEN-2099 Digital display flange type

3 ISEN-2099B Integrateddirectlead input type

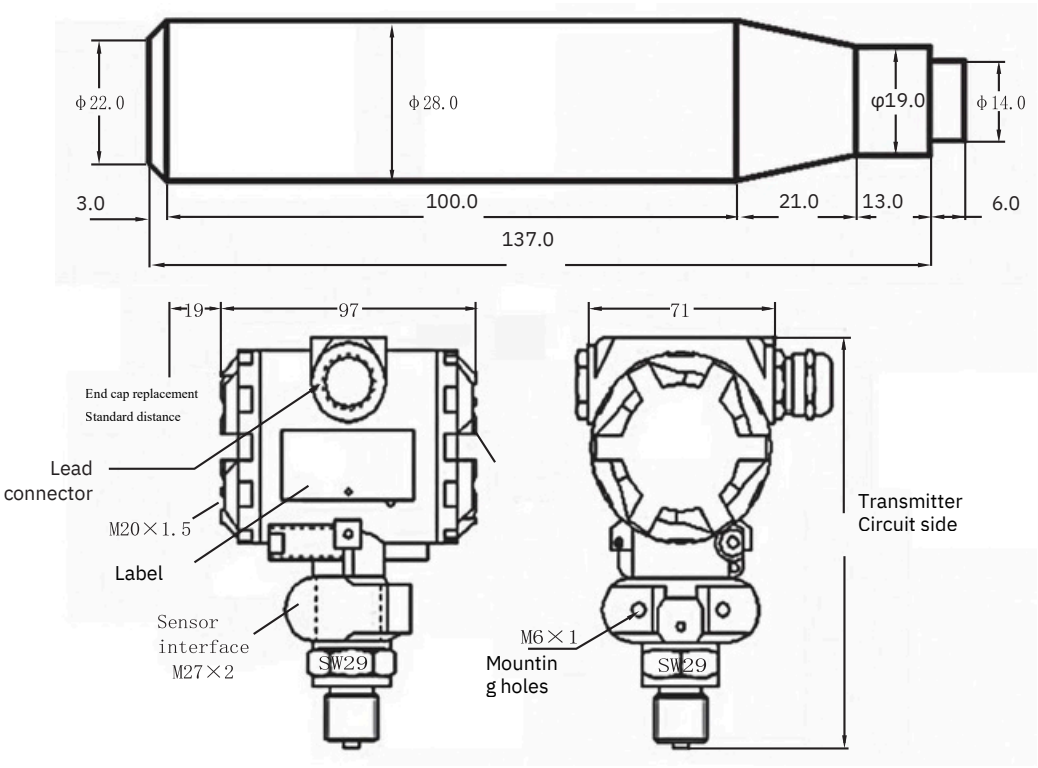
4 ISEN-2099 No display anti-corrosion type

5 High temperaturegas cylinder type

Technical Specification

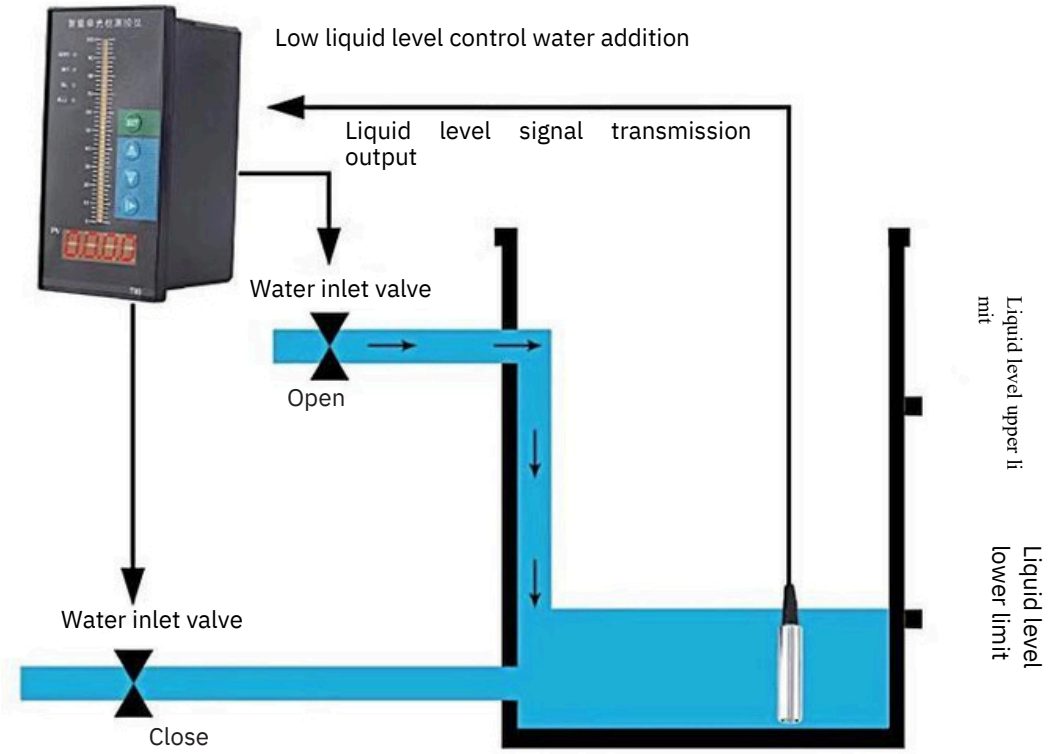
Measurement Range Selection	0~5m、0~10m、0~15m、0~20m、0~25m、0~30m、…..100m
Output Signal	4-20mA
Supply Voltage:	8~30VDC
Accuracy Class	0.25%0.5 %
Allowable Overload	150% of standard range
Operating Temperature	-40℃~80℃(special customizationavailable)
Long-Term Stability	≤±0.2%FS/year
Protection Rating	Probe: IP68 / Entire Unit: IP65
Sealing Material	Nitrile rubber (O-rings), Fluororubber (O-rings)
Pressure Connection Material	1Cr18Ni9Ti
Housing Material	Die-cast aluminum
Sensor Diaphragm Material	Stainless Steel 316L
Connection Methods	Submersible: φ8mm PVC cable，Rod-type: 1Cr18Ni9Ti (AISI 304) stainless steel，Flange-mounted: DN25 or user-specified，Threaded: 1/2" NPT, M20x1.5, or user-specified thread

Outline Drawing (For Reference)



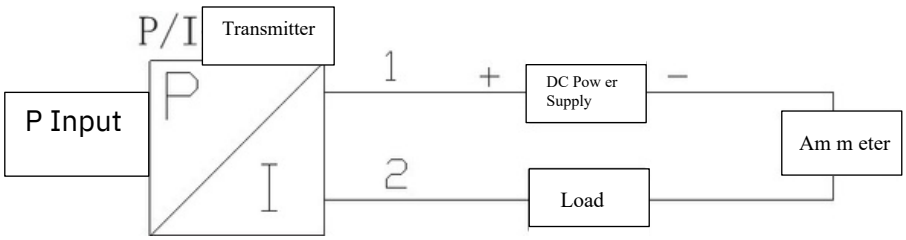
Product structure analysis

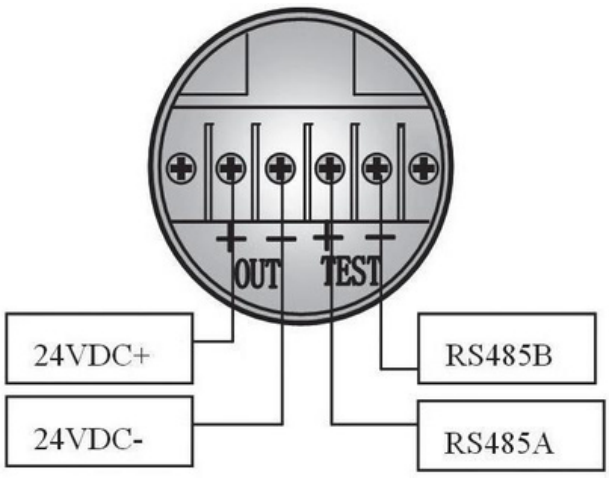
Liquid level control solutions



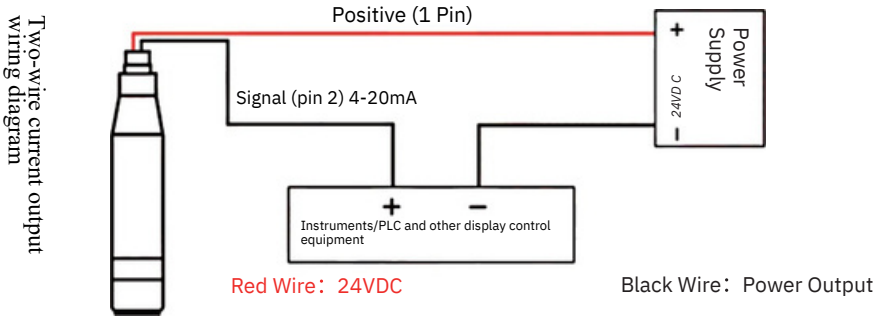
Electronic wiring

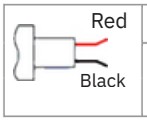
The signal terminal is set in a separate compartment of the electrical box. When wiring, the meter cover on the wiring side can be unscrewed. The power supply is connected to the transmitter through the signal line, and no additional wiring is required .





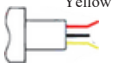
Electrical Wiring (Continued)





Output Type	Function	Color
Two-wire 4-20m A	Power+	Red
	Singal +	Black

Current output



Output Type	Function	Color
ThreeWire 0-5VD C 0-10VD C 1-5VDC 0 .5-4.5 VD C	Power+	Red
	Si gn al +	Bl ac k
	Pu blic -	Yellow

Voltage output

Note: 1. Signal lines can be twisted pairs. In situations where electromagnetic interference is severe, it is recommended to use shielded wires and properly ground them. Do not put signal lines through metal pipes or in the same wire trough as other power lines, and do not pass them near strongelectrical equipment.
2. The threading holes on the electrical housing of the transmitter should be sealed or plugged (with sealant) to avoid moisture accumulation in the electrical housing. If the threadingholes are not sealed, the transmitter should be installed with the threading holes facing downward to drain the liquid. 3. The signal line can also be floating or grounded at any point in the signal loop, and the transmitter h ousing can be grounded or not. 4. Because the transmitter is grounded through cap acitive coupling, a megohmmeter higher than 100V cannot be used when checking the
insulation resistance, and a voltage of no more than 45V should be used for circuit inspection.
The instrument adopts the coexistence design of RS485 and 4-20mA current, so the instrument can output 4-20mA and RS485 signals at the same time. When the RS485 load is relatively small (large resistance), communication has no effect on the current. The maximum current supplied by the instrument to RS485 (without affecting 4-20mA) is 1.8mA. Therefore, if RS485 and 4-20mA are to coexist without affecting each other, the input impedance of RS485 cannot be less than 3/1.8mA=1.7K ohms.

Precautions

1. Please connect correctly according to the wiringmethod shown in the figure. If connected in reverse, there will be no signal output due to the protection measures taken inside the transmitter. The transmitter can work when the power is turned on, but the output signal after preheating for 30 minutes is more stable and reliable. 2. The transmitter is used in media that are not corrosive to silicon and stainless steel (except for special anti-corrosion types).

3. The maximum pressure that can occur in the measured system cannot exceed the rated overload value, the back pressure end of the transmitter cannot be directly connected to conductive, corrosive liquids or gases, and the air guide holes of the liquid level sealed air guide cable cannot be blocked.

4. It is strictly forbidden to extend sharp and hard objects into the pressure output hole, and the diaphragm of the flush membrane type transmitter cannot be collided with hands or anything else.

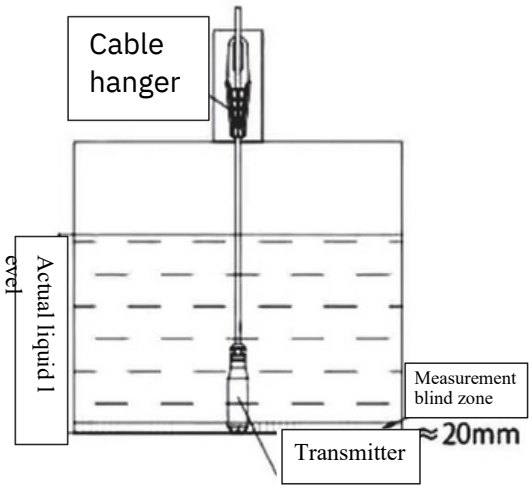
5. This product is a precise primary measuring instrument. It is strictly forbidden to hit it at will, clamp it forcefully, disassemble it, or poke the pressure guide hole with sharp metal tools.

6. If the output is abnormal, stop the machine for inspection. If it is a product quality problem, return it to our factory for repair and exchange together with the warranty card and instruction manual.

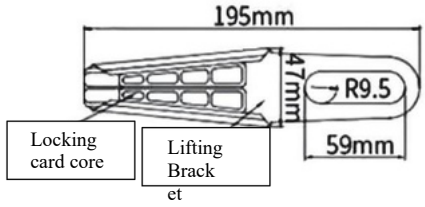
7. Non-professionals are not allowed to disassemble the instrument circuit board or change other devices.

8. The product communication uses RS485 interface and the protocol is MODBUS-RTU protocol. Please contact our company for specific communication software and protocols. We have a full set of transmitter evaluation test software and documents.

Installation Diagram



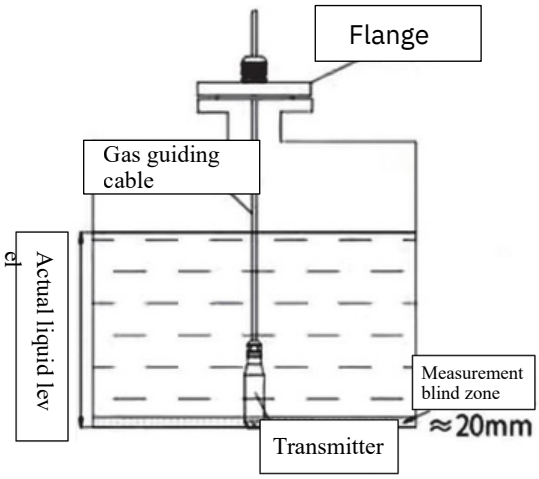
Cable hanger installation diagram



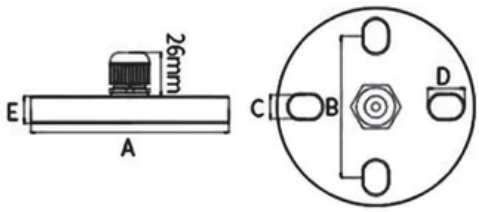
Locking card core material: engineering plastic Hanger material: 304 stainless steel

Weight: 110g

Cable Hanger Dimensions



Cable fixing flange installation diagram



Cable fixing flange dimensions

Appearance and installation : The liquid level transmitter (soft line immersion type) consists of a housing, an amplifier, a terminal block, a protective cap and a hollow wire. Installation method :

1. Choose a place that is easyto operate and maintain for installation
2. It should beinstalled as far awayfrom vibration sources as po ssible
3. It should be installed as far awayfrom heat sources as possible
4. When installing the immersion type liquid level transmitter, the metal probe should sink to the bottom of the container

Selection Chart

Model	Product Name
ISEN-( )	Submersible level transmitter

Code	Transmitter structure type
2099	Split type with junction box
2099B	Integrated type without junction box

	Code	Measuring Range
	1	0~5m
	2	0~10m
	3	0~15m
	4	0~20m
	5	0~25m
	6	0~30m
	Y	Customizable

	Code	Output Signal
	1	4~20mA
	2	4~20mA/Hart
	3	RS485 Communication
	Y	Customizable

	Code	Accuracy level
	2	0.25%FS
	5	0.5%FS

	Code	Power Supply
	D	24VDC

	Code	Operating Temperature
	N	-20~80℃
	T	-20~200℃

	Code	Display type
	0	No display
	1	With display

	Code	Connection method
	S	G1" thread installation
	F	DN50 flange installation
	Y	Special specifications can be customized

	Code	Probe material Stainless steel
	4	SUS304 Stainless steel
	6	SUS316L
	F	Polytetrafluoroethylene PTFE

	Code	Sensor type
	1	Diffused silicon sensor
	2	Ceramic capacitor sensor

Selection Chart (Continued)

	Code	Cable Sheath
	3	Polyethylene Rubber
	4	Stainless Steel SUS304
	5	Nitrile Rubber
	F	Pol ytetrafluoroethylene (PTFE)

	Code	Explosion-proof Type
	P	Standard Type
	E	Explosion-proof Type

Selection Example

Example: ISEN-2099-215DN1S415P, submersible level transmitter, split type with junction box, measuring range 0~10m, output signal 4~20mA, accuracy level 0.5%FS, power supply 24VDC, working temperature -20~80℃, with display, connection method G1" thread installation, probe material stainless steel SUS304, sensor type diffused silicon sensor, cable sheath nitrile rubber, explosion-proof form standard type.

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VALVELink
All your process control needs

Valvelink Co., Ltd. (VIETNAM)
Address: 399 Nguyen Thi Kieu Street, Tan Thoi Hiep Ward, Ho Chi Minh City, Vietnam
Hotline: +84 933 603 406
WhatsApp: +84 979128773
Email: contact@valvelink.vn / tech@valvelink.vn
Website: valvelink.vn

Valvelink Sdn Bhd (ASEAN)
Address: 1-20-02, M-City Ampang, Jalan Ampang, 57450 Kuala Lumpur, Malaysia
Hotline: +60-173700361
WhatsApp: +84 979128773 / +84 933 603 406
Email: sales@valvelink.asia
Website: valvelink.asia

Valvelink Europe Ent (EUROPE)
Address: Via Roma 108, Cassina de Pecchi, 20060, Milan, Italy
Hotline: +90-2123818702
WhatsApp: +84 979128773 / +84 933 603 406
Email: sales@valvelink.eu
Website: valvelink.eu

Boon (tianjin) Environment Technology Industry Co.,ltd. (CHINA)
Address: Unit B, 1F, Building A, No. 5 Ziyang Road, Nankai District, Tianjin, China
Hotline: +84 979128773
WhatsApp: +84 933 603 406
Email: sales@valvelink.asia
Website: valvelink.com.cn