



# Model WC – 2021 Update

Electromechanical Inventory Level  
Measuring & Monitoring System

## Installation, Operation & Maintenance Manual



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# 1. Instruction

Thank you for purchasing this Fine Tek product from Blue Level (USA Authorized Dealer). This user manual will introduce the product features, operations, maintenance and troubleshooting to help the user get familiar with the product and avoid possible hazardous situations. Before operating this device, please carefully study the product details.. In case of any unexpected problem, don't disassemble the product by yourself as this will void the product guarantee. If you have any questions, don't hesitate to contact us.

## Symbol Instruction



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



ATTENTION indicates a hazardous situation which, if not avoided, will result in injury and damage to the equipment.



Wrong operation will result in electric shock.



Keep away from flammable materials or keep in an electrical safe environment.



Forbidden operation

## Safety Terms & Symbols



**WARNING:** Warning statements identify conditions or practices that could result in injury or loss of life. Risk of electrical shock exists.

**CAUTION:** Caution statements identify conditions or practices that could result in damage to this product or other property.

## Safety Summary



### General Safety

**CAUTION:** It is important that all instructions within this manual be followed to ensure proper operation of the equipment and safety of operating personnel. The product should be installed and maintained by qualified and authorized personnel only. Install according to installation instructions and comply with all National and Local codes. Use electrical wire that is sized and rated for the maximum voltage and current of the application.



### Electrical Shock Caution

Model WC Inventory Level Monitoring Sensors are powered with HIGH VOLTAGE. No operator serviceable parts are inside. All servicing is to be performed by qualified personnel. Each Model WC is provided with a “protective conductor terminal” which shall be terminated to earth ground potential (see Connections). This product’s design complies with EN61010-1 installation category II and pollution degree 2.



### Electrical Location Caution

Model WC Inventory Level Monitoring Sensors are suitable for Ordinary Hazardous Locations only (refer to Technical Data).



**Enclosure Integrity** – The Model WC enclosure is manufactured from aluminum, sensing cable is Nylon jacketed stainless steel and sensing weight may be aluminum, stainless steel or plastic. The user or installer should consider the performance of these materials with regard to attack by aggressive substances that may be present. The dimensions of the enclosure shall not be altered.



**Maintenance** – Power to all circuits must be disconnected before conducting any investigation, setup or maintenance of the unit.

## Electromagnetic Compatibility (EMC):

The Model WC Inventory Level Monitoring Sensors was tested and found to comply with the standards listed below:

Low Voltage Directive: 73/23/EEC

Standard IEC: 61010-1 (ED.2):2004

EMC Emissions EN 61326-1:2006

EMC Immunity EN 61326-1:2006

Models: Model WC Universal 100-240Vac

## Warning



- Be sure to power off before wiring.
- Do not touch any wire terminal during power on to avoid electrical shock and always keep the screws secured.
- Connect the wires to the terminal in the correct order on the wiring diagram.
- Repairing, modifying, or taking apart the product will void the guarantee.
- Never place this product near any environment with explosion or flammable gas atmosphere concerns.
- User should check the power supply if it is within operation range and keep from over range operation.
- Never operate instrument near flammable gas, and liquid environment.
- Avoid exposure to vibration, high temperature, high humidity, sunlight, and high frequency machine operation environment.
- To get long life operation, it is suggested to install cooling system with your system.

## Before Using This Product



- Check if the content is the order model you expected.
- Avoid exposure to shock, vibration or dropping the product.
- Suggested warm up time is over 30 minutes before operation if user is concerned with accurate temperature compensation.

## Product Mounting



- Should not mount in a location that is easy to freeze, dusty or comes in contact with corrosion gas.
- Avoid placing the product in high temperature fluctuation environment, and keep away from high temperature environment ( $>55^{\circ}\text{C}$ ).
- Check if any device will create high electric interference nearby – adopt appropriate isolation, grounding or filtering power line if necessary.

## 2. Warranty

### Standard Warranty

Each Blue Level Technologies Model WC Smart Inventory Monitoring Sensor product from Fine Tek is backed by our industry leading 2-year limited warranty. Should you experience a problem with one of our products deemed by our factory to be a product failure covered by our warranty, for a period of 2-years from the date of shipment we will repair the unit at our factory or provide you with a replacement unit or sub-assembly at our discretion. A return authorization number must be obtained from a Blue Level Technologies customer service representative BEFORE returning any unit. Refer to the below details for more information.

Details: We warrant Blue Level Technologies products to be free from defects in workmanship and materials when operated under normal conditions and in accordance with nameplate characteristic limits. Products must be installed and maintained in accordance with this Blue Level Technologies installation, operation and maintenance instructions. Users are responsible for the suitability of the products to their application. There is no warranty against damage resulting from misapplication, improper specifications, or other operating conditions beyond our control. Claims against carriers for damage in transit must be filed by the buyer.

This warranty shall be in effect for a period of twenty-four months from the date of shipment. THIS WARRANTY SHALL BE IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Blue Level Technologies will repair or replace, at its option, any product which has been found to be defective and is within the warranty period, provided that the product is shipped, with previous factory authorization, freight prepaid, to the factory in Richfield, Ohio, U.S.A.

Blue Level Technologies is not responsible for removal, installation, or any other incidental expenses incurred in shipping the products to or from Blue Level Technologies. Blue Level Technologies' liability under this warranty shall be solely limited to repair or replacement of the products within the warranty period, and Blue Level Technologies shall not be liable, under any circumstances, for consequential or incidental damages, including, but not limited to, personal injury or labor costs. Under no circumstances will Blue Level Technologies be responsible for any expense in connection with any repairs made by anyone other than the factory, unless such repairs have been specifically authorized in writing.

## 3. Introduction

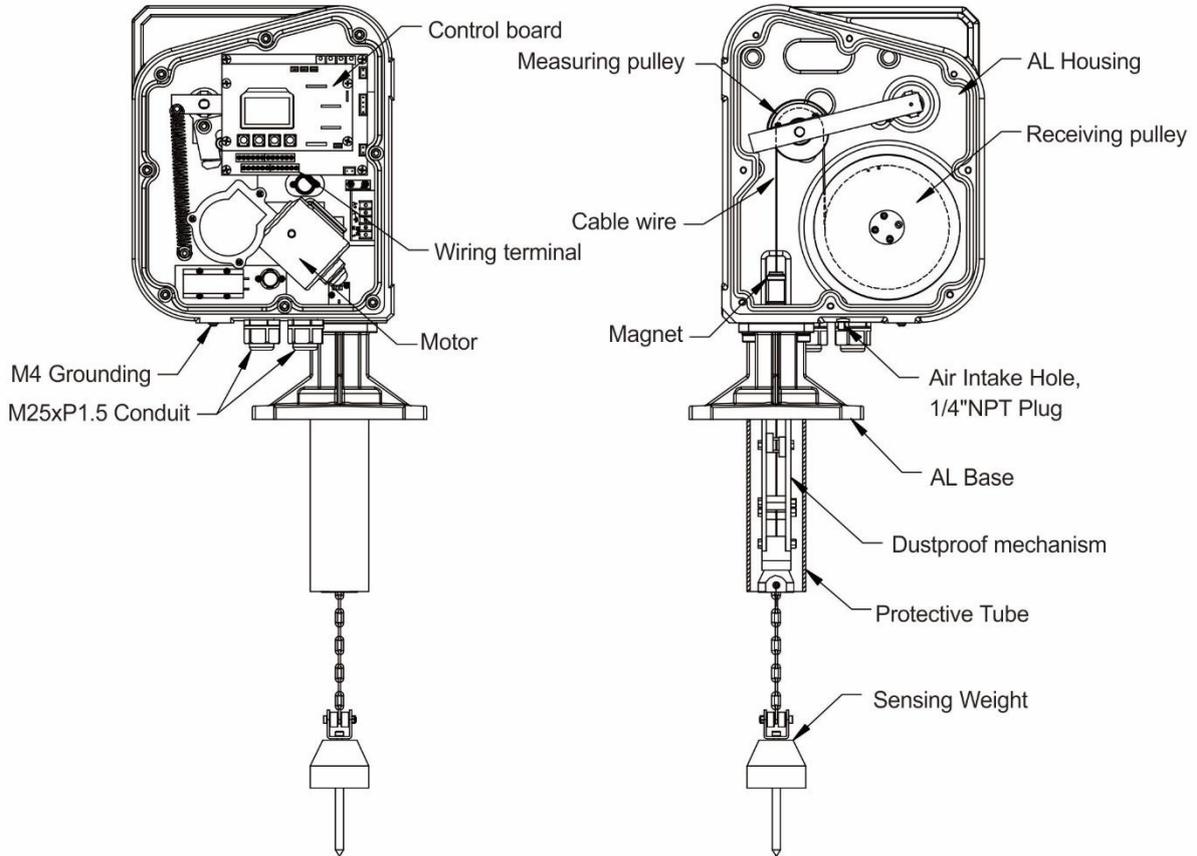
### 3.1. Product Features

- Measurements are independent of environment variation (sound waves, dust, capacitance, humidity and temperature), and is suitable for various industrial applications.
- User-friendly operation and full functionalities with microprocessor control.
- Relay output (5A/240Vac)×4: HI, LO alarm or Pulse, Reset, fault alarm, operation indication or Lock alarm output can be programmed.
- LCM Graphic 128x64 Dots
- Analog output: 0-20mA / 4-20mA.
- Pulse output: Transistor output (NPN/PNP).
- Cable Break Alarm: System will detect automatically if cable is broken during operation.
- Sensing Weight Buried Alarm: System will detect automatically when the sensing weight is buried in the measured material.
- Four Detection Modes:
  - I. Auto operation: in period, system will be waked up in certain time period depend on the pre-setting.
  - II. Manual operation: User can operate system at front panel to set procedure any time.
  - III. Intelligent (smart) operation: The Model WC will vary its detection frequency to shorten the measuring time while the detected material level is more far away from the Model WC. This function is especially useful while customer's storage or reservoir is subjected to fast changes in level (Ex: Pour in / Pour out). This smart function will decrease the possibility of weighted head being buried or malfunctioning.
  - IV. External trigger operation: Support external command to start on the system.
- Auto Return Setup: User can set the sensing level threshold and force the system return at the preset threshold value. This function is especially of service while the measured material in storage or reservoir is lower than the threshold level..
- Material Fill-Up Protection: While user's facility is on material pour status, the system will be triggered (By Fill-Up Protection Input) hold and return to its original position to reduce malfunction or buried weight head possibility.
- Maximum measuring range of 30m.
- RS485 communication protocol available.
- Versatile sensing weight options satisfy various customer requirements.
- Freeze Protection: The Model WC incorporates an internal heater element to warm up the electric board within shell housing to work normally in **most** severe cold environments.

### 3.2. Principle

The Model WC EE310 series Electro-Mechanical Level Measuring System consists of a sensing weight, a cable wire, a pulley set with Hall sensor to count level distance, and a calculating electric board. While measuring, the descending cable wire will drive the pulley set in rotation, where the Hall sensor will count the number of pulley rotation as an index. The electric board will calculate the pulse command sent to motor, and the actual descending length can be transferred by pulse command and the rotations of pulley. All data displayed at the front panel, can be transferred to output.

### 3.3. Sketch & Drawing



Front View: Electric Board & Motor

Rear View: Wiring Mechanism

### 3.4. Applications

- Measurements are independent of environment variation (sound waves, dust, capacitance, humidity and temperature, and is suitable for various industrial applications.
- Typical applications are metallurgical industry, mining, cement industry, power plant, ship manufacturing industry, chemical industry, feed industry, food industry etc.
- Control process is compatible with the need of general power, pellet, lump or bulk material monitoring.
- Standard output can be further connected with customer's central managing system.

## 4. Specifications

### 4.1. Technical Parameters

NO.	Category	Specification		
1	Power Supply	100~240Vac, 50/60 Hz (Standard) 20~28Vdc (By order)		
2	Measuring Resolution	Transistor output NPN / PNP $\pm 5$ pulse(10mm/pulse) Relay output $\pm 1$ pulse(100mm/pulse)		
3	Measuring Speed	Avg. 0.23m/s		
4	Analog Output	0/4-20mA $\pm 1\%$		
5	Pulse Output	NPN/PNP output : max. 60Vdc, max. 400mA ※ When the counter is connected, the pulse extraction rate needs to be $> 50$ Hz. Relay output (dry contact): ※ When the counter is connected, the pulse extraction rate needs to be $< 30$ Hz.		
6	Relay output	SPDT 5A/240Vac X4 Relay 1 : Pulse / HI Alarm (can be set up) Relay 2 : Reset / LO Alarm (can be set up) Relay 3 : Failure Relay 4 : Run Signal / Lock (can be set up)		
7	Status LED	Indication for Power Run Signal Abnormal		
8	Display	LCM Graphic 128x64 Dots		
9	Ambient Temperature	$-40^{\circ}\text{C} - 60^{\circ}\text{C}$		
10	Operating Temperature	$-40^{\circ}\text{C} - 80^{\circ}\text{C}$		
11	Measuring Range	30m Max		
12	Protection Level	IP66		
13	Body material	Aluminum		
14	Anti-Dew Heater (Optional)	Start heating $< 16^{\circ}\text{C}$ ( prevent frostbite, prevent dew )		
15	Cable Break Detection	Yes		
16	Sensing Weight Buried Detection	Yes		
17	Manual/Auto Measuring Mode	Yes(0.1-99h)		
18	Motor Protection	Yes		
19	Malfunction Diagnosis Display	Yes		
20	Material Fill-Up Protection	Yes		
21	External trigger start	Yes		
22	Communication Protocol (RS485)	Yes	Baud rate	9600.19200.38400.57600
23	Intelligent Start	Measuring interval is inverse proportional to medium level.		
24	Reset Output	Yes		
25	Cable Wire	$\phi 1.2$ mm		

## 4.2. Product Specifications

- Power supply (Options) : AC type: 100~240Vac, 50/60Hz  
DC type: 20~28Vdc
- Power Consumption at Stand-by: 6VA
- Display : LCM Graphic 128x64 Dots
- Analog output : 0/4~20mA, support bi-direction arrangement (High level for maximum current output and low level for minimum current output, or vise verse. )
- Relay Alarm: SPDT 5A/240Vac, 2A/48Vdc x4
- Operation Temperature: -35°C~ 80°C
- Ambient Temperature: -35°C~ 60°C
- Material: Body --- Aluminum , Cable Wire --- SUS 304 (Φ1.2mm)
- Flange : □180
- Measurement Range: 1~30m
- Total Weight: 13kg
- Sensing Weight Type :

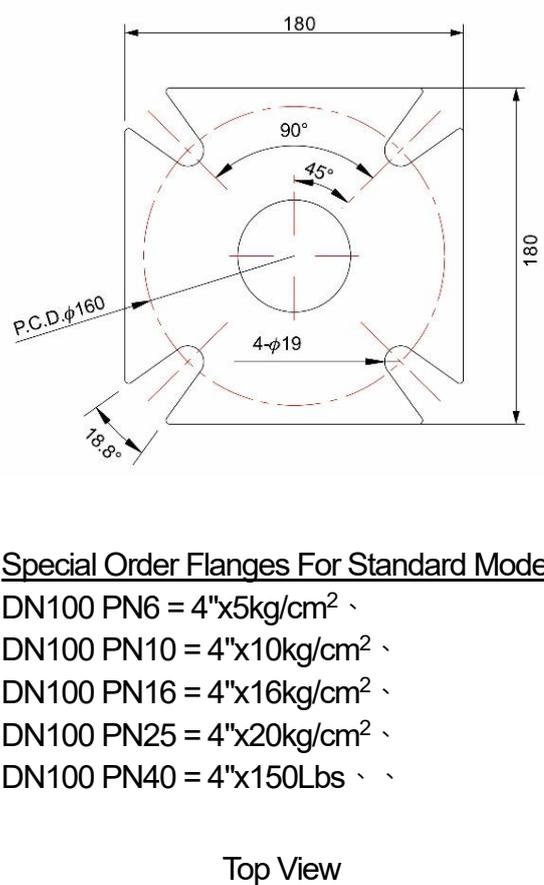
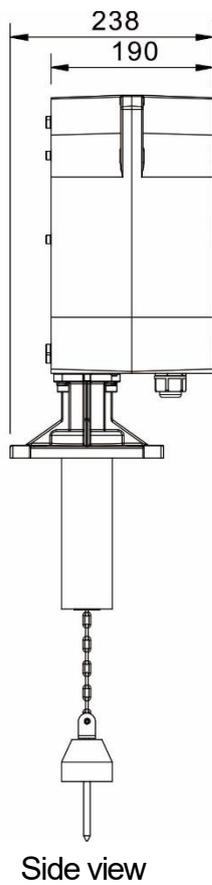
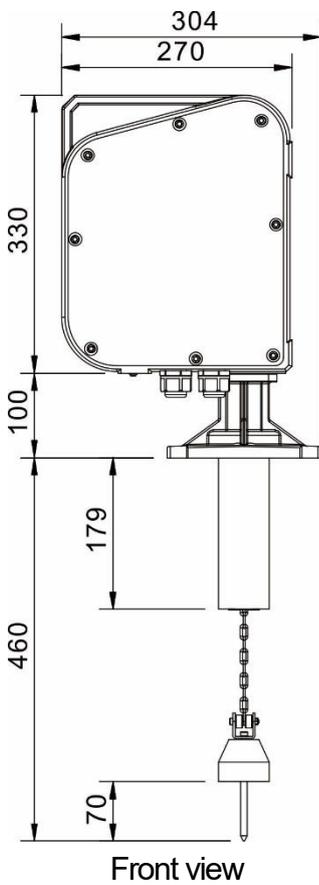
Code	A	B	C	D
Name	Standard type Stainless steel	Float type Stainless steel	Umbrella Stainless steel	Auto-Fall-Off Plastic
Type				

※ Custom made is available for sensing weight

- Sensing Weights Materials & Application:
  - I. Type A: Standard type; Materials: Stainless steel,  
Application: For coarse bulk solids, e.g. coals, ores, fly ash or stones and granulated.
  - II. Type B: Float type; Materials: Stainless,  
Application: For Liquid applications.
  - III. Type C: Umbrella type; Materials: Stainless,  
Application: For very light and loose bulk solids, e.g. flour or coal-dust.
  - IV. Type D: Plastic Auto-Fall-Off; Materials: HDPE;  
Application range: With Auto-Fall-Off function of overweight, the damage caused by the pulling or buried wire into the material can be avoided- the material filled inside this weight may not contaminate the detected material. It is suitable for powder, granular and coarse bulk solids, such as food, feed, coal, ore or stone.

### 4.3. Product Dimension

(unit: mm)



**Special Order Flanges For Standard Model:**

- DN100 PN6 = 4"x5kg/cm<sup>2</sup> 、
- DN100 PN10 = 4"x10kg/cm<sup>2</sup> 、
- DN100 PN16 = 4"x16kg/cm<sup>2</sup> 、
- DN100 PN25 = 4"x20kg/cm<sup>2</sup> 、
- DN100 PN40 = 4"x150Lbs 、

## 5. Product Examination

### 5.1. Disassembly

- 5.1.1. Before disassembly, please carefully check if the packaging is damaged. Please take photos for any broken or damaged packaging as proof of damage
- 5.1.2. Check that the package includes all the parts; any missing or broken items will be replaced with a new one if photo documented
- 5.1.3. Please contact us and provide claim with photos within 7-days after acceptance. Over 7-days, it is regarded as acceptance of well delivery.

### 5.2. Handling Instructions

- 5.2.1. The product should be moved and handled carefully
- 5.2.2. Don't pull and drag the cable wire or hammer the weight head as it will damage the product.
- 5.2.3. When installing the product at 3 m above ground or higher, it is suggested to operate with hoist.

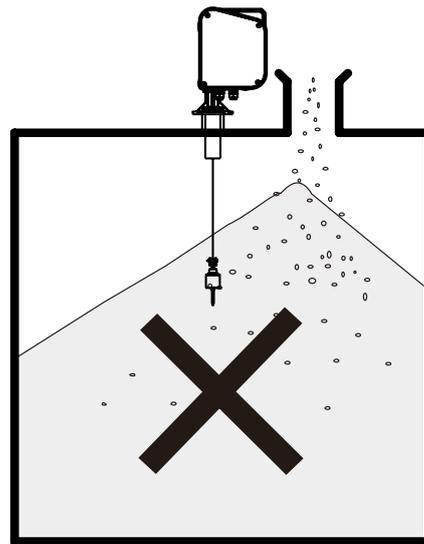
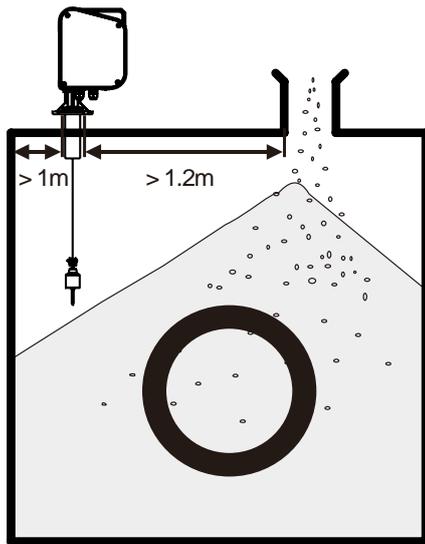
## 6. Installation



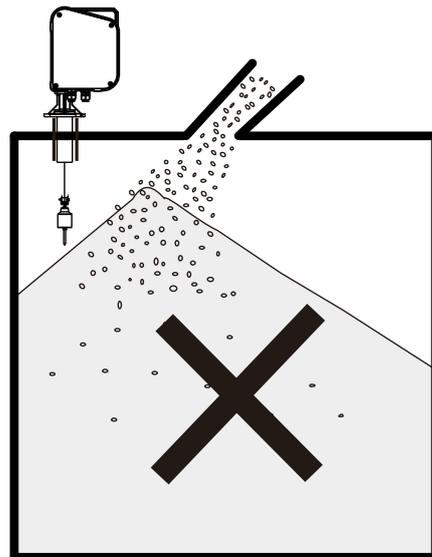
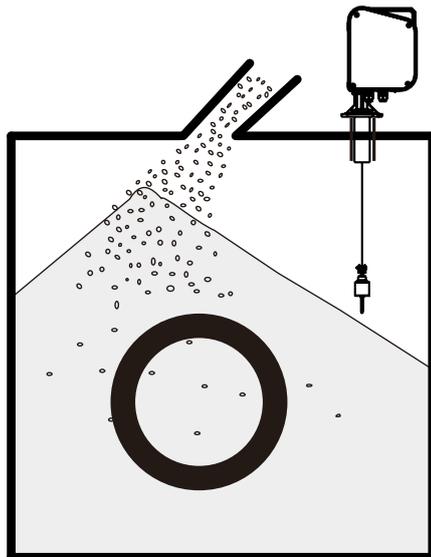
### 6.1. Location Selection

6.1.1. Installation position should be away from the inlet or outlet of reservoir at least 1.2 m, and avoid locations interfering with the conveying system to avoid damage to the facility.

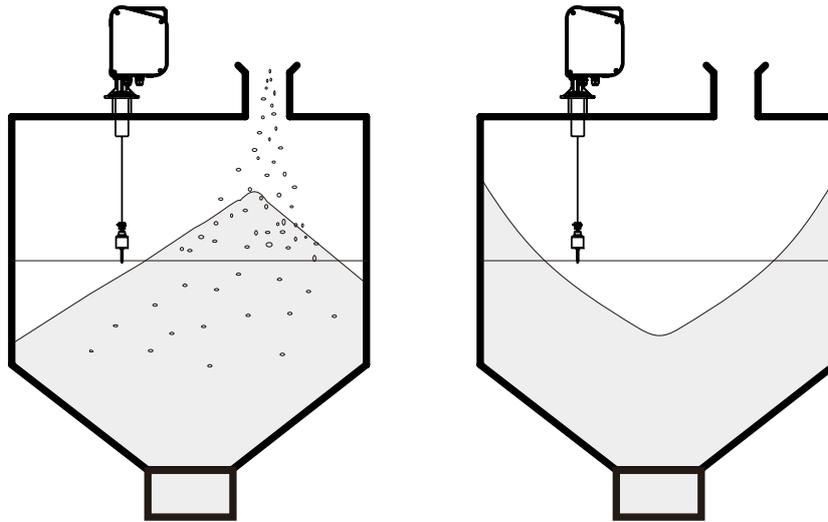
6.1.2. Reservoir or tank equipped with observation window is suggested; it will be beneficial for future maintenance. The installation location should be away from the ladder, frame or any protrusion. The minimum distance between the EEX center and tank wall should be 1m or more.



6.1.3. Must be located away from the inlets flow direction to avoid the cable and hammer being damaged by material or disconnected or buried.



6.1.4. The optimal position is at the average depth of measured material, it will generally locate at mountainside between the peak and bottom (the cone angle from by the pouring process), indicates below.

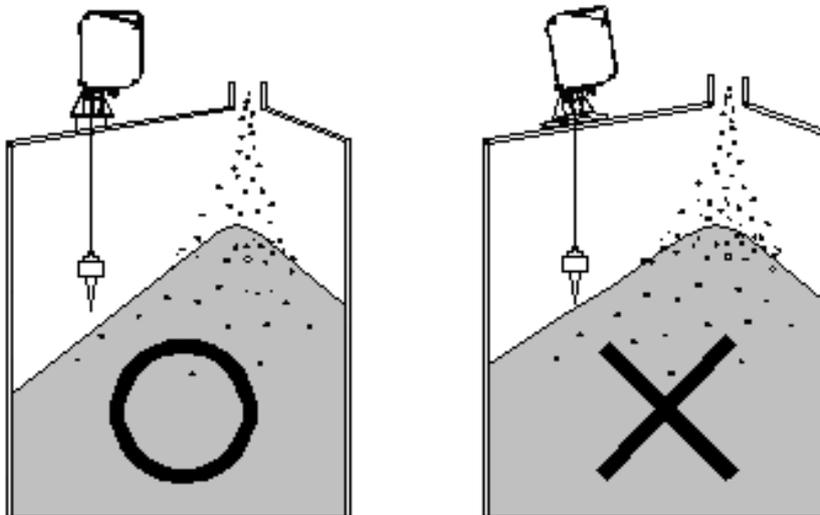


## 6.2. Installation Instruction

6.2.1. During installation, the flange should be mounted at horizontal. Besides, the housing and cable wire should be kept in vertical direction related to the measured material level. It should be carefully checked that the flange can let the wire cable move free and that it doesn't rub against the body.

6.2.2. On demand, user may connect an extending tube to connect the flange. If you do that, keep it in mind that minimum diameter should not be less than 4".

6.2.3. If leakage is observed, manufacturer suggests customer should use O-ring seal or washer between the flange connections.



## 6.3. Caution

6.3.1. During installation, user should carefully check that the cable wire is wound up well in pulley set and no kinks, broken, or any abnormal compress on the cable wire.

6.3.2. The cable wire should be put on the hole of the weight head connector and be secured tightly by screwdriver.

6.3.3. Firmly secure the screws to fix the front cover and body, otherwise dust or powder may seep into the electric board.

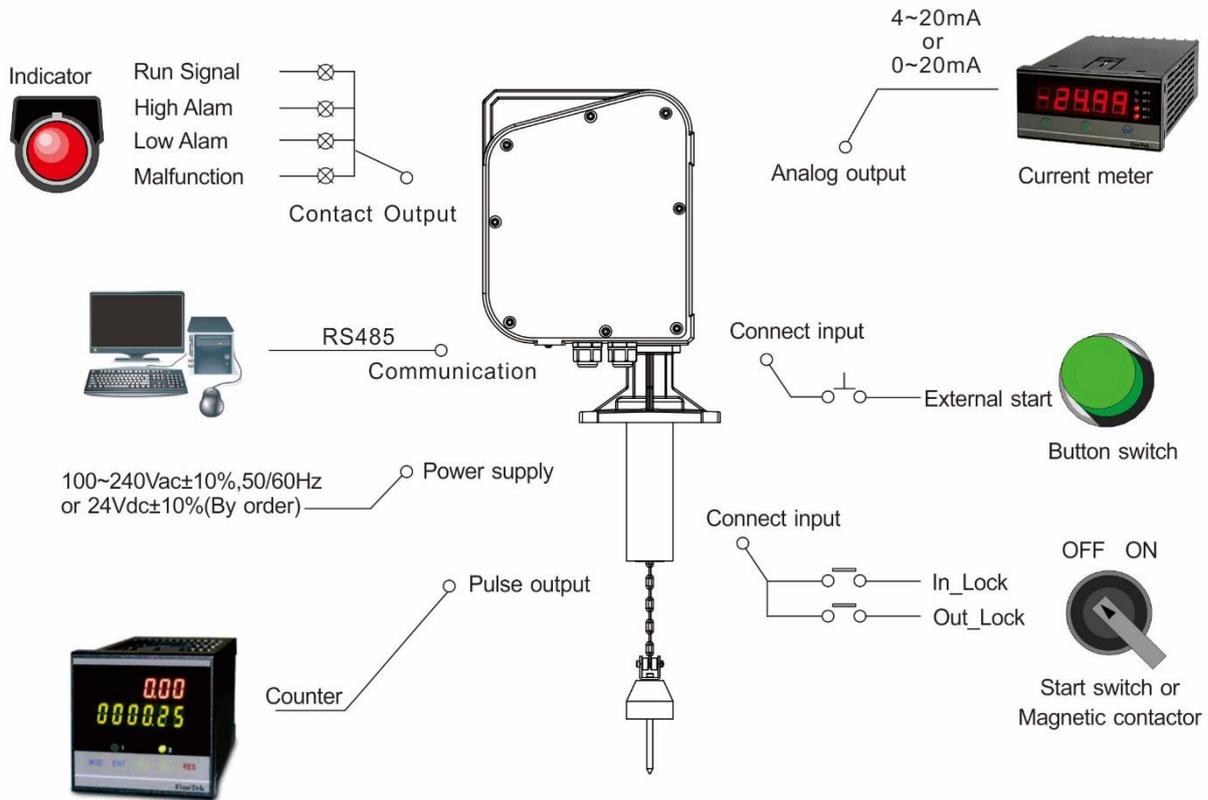
6.3.4. The opening portion for the weight head and cable wire must be larger than 104 mm.

## 6.4. Wiring Instruction



### 6.4.1. System Diagram Example

**✘** Below image is an example only, of how the WC sensor can be integrated into your facility / system, **this manual is specific to only the operation of the Model WC sensor.**



#### Warning:

In order to avoid the sensing weight to be buried or impacted by the material and cause the damage on the equipment, please install material fill-up protection. It is recommended to connect with the conveyor control switch or the “NO” contact input of the contactor. If there is a concern that the sensing weight will be caught by the conveyor and cause damage to the equipment, It is recommended to install the material outlet protection and connect it in parallel with the fill-up protection



6.4.2. Manufacturer suggests 0.75mm<sup>2</sup> non-twist multiple-cores isolated electric wire to connect with the terminal block. The power line should be separated from the signal lines. It is recommended to leave a flexible length of electric wire to avoid pull and drag by the electric board.

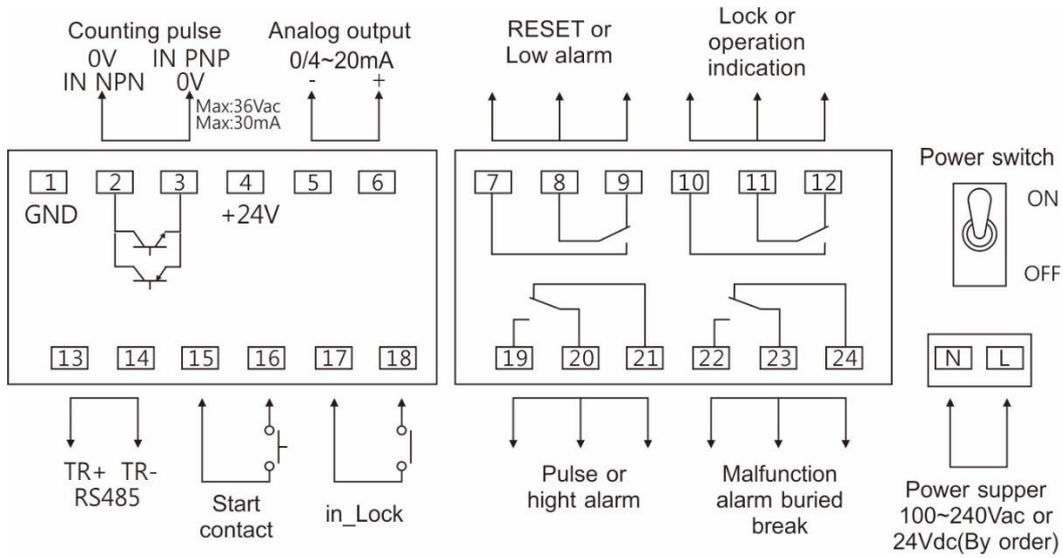
6.4.3. Strip the electric wire to the appropriate length – do not leave unnecessary bare wire exposed.



6.4.4. All bare wires should be soldered and secured well to the terminal block.



6.4.5. Wiring label should be clearly identified and wired correctly. The wiring diagram is below.



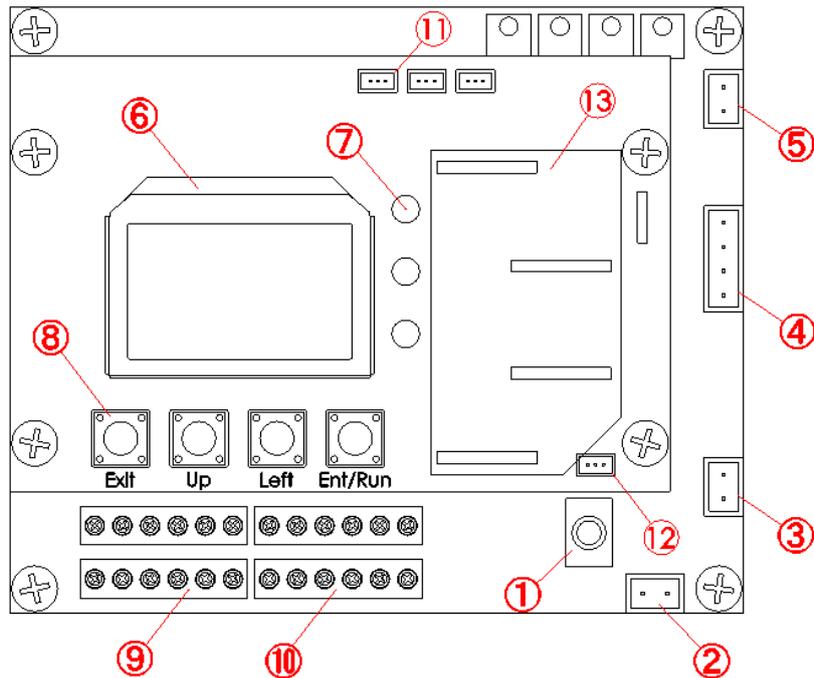
#### 6.4.6. Connect Assignments



Terminal number	Description
2.3.	Transistor Output (Pulse) NPN/PNP
5.6.	Analog Output 0/4-20mA(AGND.AOUT)
19.20.21.	Relay 1 : Pulse or High Alarm (NO1 、 COM1 、 NC1)
7.8.9.	Relay 2 : Reset or Low Alarm (NO2 、 COM2 、 NC2)
22.23.24.	Relay 3 : Malfunction alarm ...(NO3 、 COM3 、 NC3)
10.11.12.	Relay 4 : Operation indication or Lock (NO4 、 COM4 、 NC4)
13.14.	RS485 (TR+ 、 TR-)
15.16.	Start Connect (RUN 、 GND)
17.18.	Material fill-up protection switch input (dry contact)

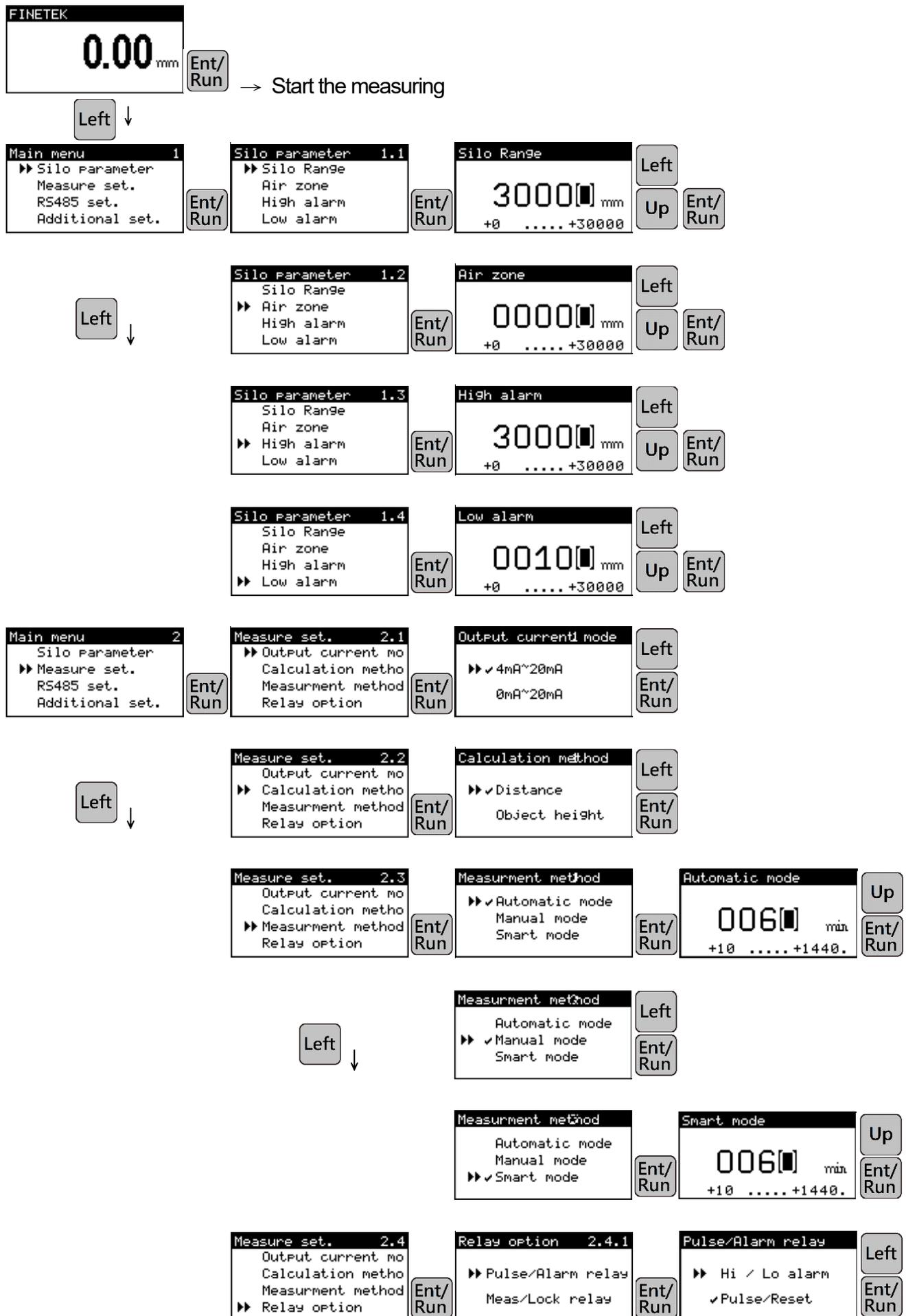
# 7. Operation

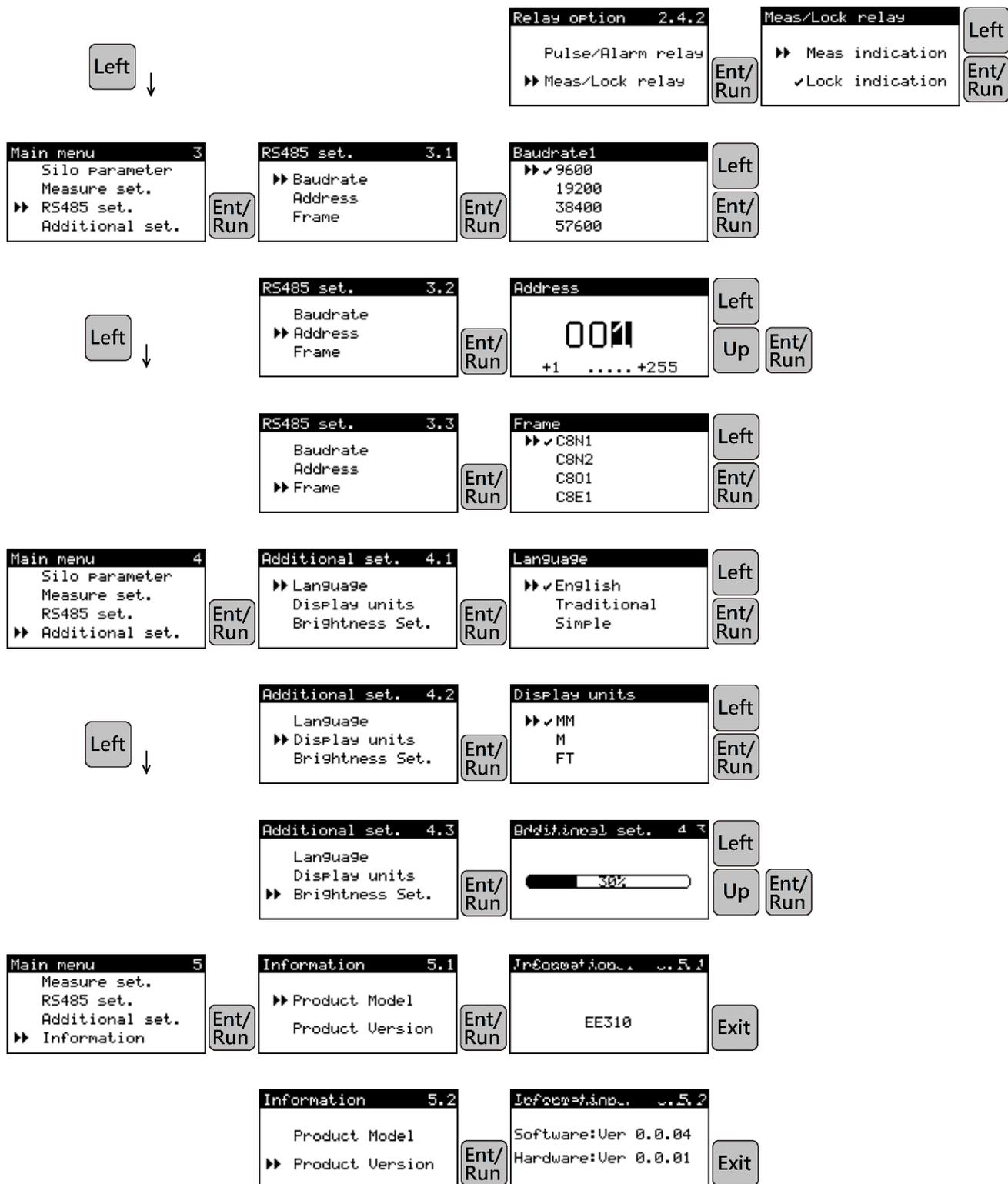
## 7.1. Panel



- ① Power switch: On-site operation, maintenance, and power off when needed.
- ② Power terminal: power input 100~240Vac, 50/60Hz or 24Vdc (please confirm the order specification)
- ③ Heater terminal: connected to the internal antifreeze heater.
- ④ Power system terminal: connect with DC power supply.
- ⑤ Motor Power terminal: connect to the motor DC24V
- ⑥ Display: status display, height indication, fault indication, parameter setting
- ⑦ Indicator light:
  - (Green) → Power indicator: Lights up when power is on, and the light is turned off when the power is disconnected.
  - (Yellow) → Operation indicator: Lights up during the measurement (up and down), and lights off when measurement ends.
  - (Red) → Fault indication: Lights up on wire breakage, buried, knot, over-heat occurs, and lights off when troubleshooting is finished.
- ⑧ Button:
  - Ent/Run: Measured value display mode = start the measuring.  
Menu mode = enter into the next menu / confirm to save.
  - Left: Measured value display mode = enter into the menu.  
Menu mode = scroll down the menu.  
Number mode = cursor moves to left.
  - Up: The number on the cursor increases.
  - Exit: Return to the previous menu.
- ⑨ Input/output terminal: Transistor pulse output/external trigger/fill-in protection.
- ⑩ Relay output terminal: Relay 1~4.
- ⑪ Connector socket: wiring with Sensor connector
- ⑫ Connector socket: wiring with Sensor connector
- ⑬ Connector socket: wiring with the wireless module (if any) connector

## 7.2. Operation flowchart





### 7.3. Communication

Address (Hex)	Address (Dec)	Data Type	Unit	Range	Definition	Authority
0x1020   0x1025	4128   4133	UINT16			Firmware version	R
0x1026   0x1027	4134   4135	FLOAT32	mm	0~30000	Measuring distance/Material height	R
0x102C   0x102D	4140   4141	FLOAT32	mA	0~20	Current output	R
0x1039   0x103F	4153   4159	UINT16			Product serial number	R / W
0x1049   0x1052	4169   4177	UINT16			Product name	R / W
0x1060	4192	UINT16		1~254	Communication ID setting	R / W
0x1061	4193	UINT16		0~4	Communication baud rate setting : 0:9600, 1:19200, 2:38400, 3:57600	R / W
0x1062	4194	UINT16		0/1	Current output mode : 0:4~20mA, 1:0~20mA	R / W
0x1063	4195	UINT16		0/1	Measurement and calculation mode: 0: material height, 1: cable-drop distance	R / W
0x1064	4196	UINT16		0~2	Measurement mode: 0: automatic, 1: manual, 2: smart	R / W
0x1065	4197	UINT16	minute	10~999	Automatic measurement time setting	R / W
0x1066	4198	UINT16	minute	10~999	Smart measurement time setting	R / W
0x1068   0x1069	4200   4201	FLOAT32	mm	0~30000	Tank height	R / W
0x106A   0x106B	4202   4203	FLOAT32	mm	0~30000	Blind distance	R / W
0x106C   0x106D	4204   4205	FLOAT32	mm	0~30000	Material height mode: high alarm Cable-drop distance mode: low alarm	R / W
0x106E   0x106F	4206   4207	FLOAT32	mm	0~30000	Material height mode: low alarm Cable-drop distance mode: high alarm	R / W
0x1070	4208	UINT16		0/1	Relay level measurement output: 0: continuous output, 1: high/low alarm output	R / W
0x1071	4209	UINT16		0~2	Display unit: 0:mm, 1:m, 2:ft	R / W
0x1072	4210	UINT16		0~2	Language selection: 0: English, 1: Traditional Chinese, 2: Simplified Chinese	R / W
0x1073	4211	UINT16		0/1	Relay 3 output function: 0: measurement display, 1: fill-in protection alarm	R / W
0x108E	4238	UINT16		0/8013	Restart: 0: No action, 8013: Restart with weight	R / W
0x108F	4239	UINT16		0/8013	External trigger: 0: no action, 8013: start measurement	R / W
0x1090	4240	UINT16		0/1	Parameter saving: 0: no action, 1: Parameter saving	R / W
0x1092	4242	UINT16		0/8013	Parameter default setting: 0: No action, 8013: Parameter default setting	R / W

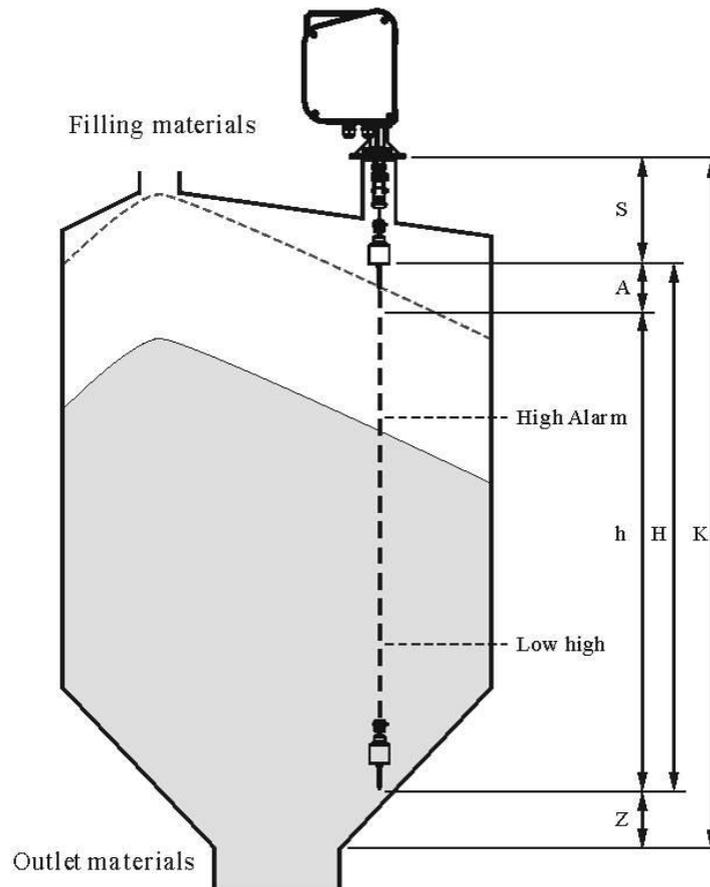
## 7.4. Setting Procedure



**Caution:** When the reservoir or storage is empty, or the detected level is unknown, please don't start the Model WC. Start Model WC only when you have basic information about the reservoir or storage. Always avoid having the weight head getting stuck by the conveyer or stirred by any mechanism near the inlet or outlet.

Before setting, user should note that the measuring level should not access the bottom of the reservoir or storage. Do not install Model WC next to any obstacle around.

## 7.5. Definition



- K→Tank Height : distance between connecting flange to tank outlet
- S→Blind Distance : distance from connecting flange to the tip of the weight
- Z→Safety Distance : To avoid obstacles and prevent weight sliding into the outlet.
- H→Measuring Height : Full measuring range from drop and return with full pulse signal record (Menu: 1.1 Silo range).
- A→Air Zone(deadband) : Variation of tank capacity and real medium level. Default setting is 0 (Menu: 1.2 Air zone).
- h→Effective measuring distance : distance will change according to A value and corresponds to 0/4~20mA output signal.
- Hi Alarm : High level alarm setup (Menu: 1.3 High alarm).
- Lo Alarm : Low level alarm setup (Menu: 1.4 Low alarm).

### 7.6. Description of Smart Mode

Smart mode operates the measurement according to the capacity and level of reservoir. In smart mode, the next measuring time period is dependent on the current level distance measured. It is roughly a step by step (0.1 hour for each step), in quasi-linear relation, as indicated below. (Note: Timer value should be larger than Smart value).

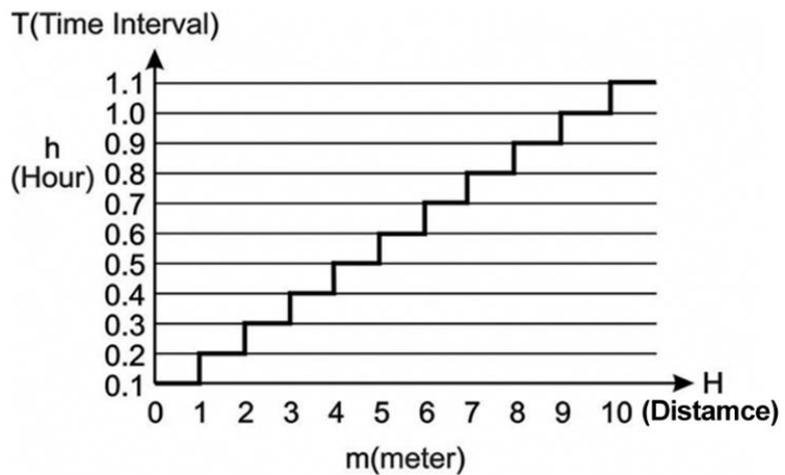
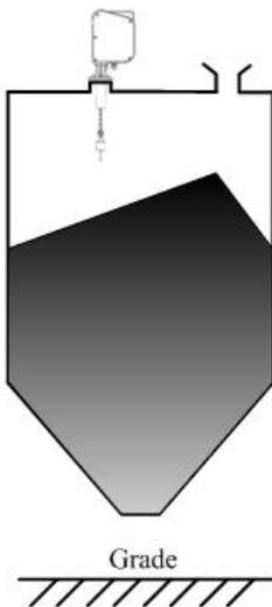
#### Example:

Timer=1.1h \ Smart=0.1h \ H=10m

Measuring time at next,  $t=(Smart+(A/H) \times (Timer-Smart))$

Where the Timer is the maximum standby time to detect, Smart is the minimum standby time to detect. A is the measuring level distance, H is the High Alarm value. T is the next measuring time since this measurement.

- A is 10m, the next start detect time is  $0.1+1 \times 1=1.1h$
- A is 1m, the next start detect time is  $0.1+0.1 \times 1=0.2h$



Time Interval And Measuring Range Comparison Table

## 8. Maintenance



### 8.1. Regular Maintenance

8.1.1 Regularly check and secure each part and examine if the screw nut is loose. Every six months open the cover and brush off the dust collected to avoid clogged up electric board.

8.1.2 Inspect the cable wire for any kinks, knots, fatigue, or breakage. Replace the cable wire according to Model WC EE310 original specification if necessary.

### 8.2. Cable Wire Replacement

8.2.1 Cut the appropriate cable wire length  $\Phi 1.2\text{mm}$  (total measuring length+500mm), and insert the cable wire through the steel pipe  $\Phi 4.0 \times 0.5\text{mm}$ . There are two holes on the side board of the receiving pulley, insert the cable wire through one hole first and then guide the cable wire to the other hole & go back through the steel pipe. Use the pliers ( $2.0\text{mm}^2$  for holes) to do the crimping firmly at the central end of the steel pipe (Fig.1).

8.2.2 Insert the end of the cable wire through in order from the measuring pulley, sliding rod, dustproof brush, dust wiper, dustproof mechanism base (note that the sequence path cannot be misplaced, refer to Fig. 2). Straighten out the cable wire and eliminate bending or entanglement to ensure it could rewind smoothly, and if it stands on high location, please drop the cable wire freely at a safe area.

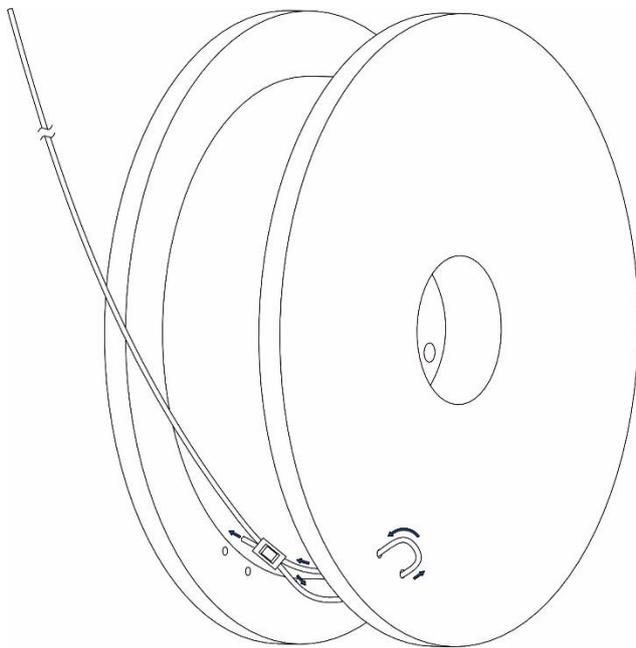


Fig.1

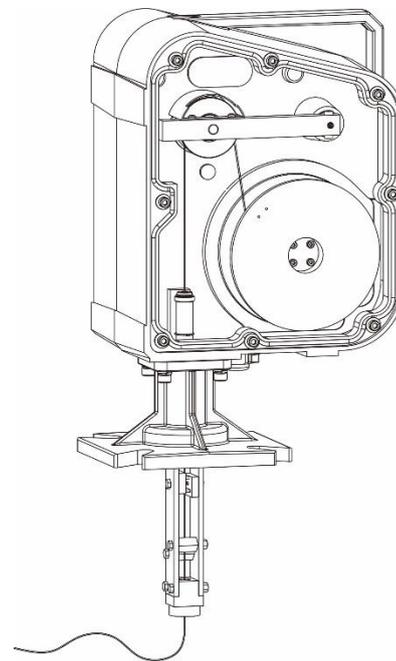


Fig.2

8.2.3 Put on the gloves on one hand and slightly drag the cable wire to avoid being too loose when it winds up. Operate the power ON/OFF by the other hand to control the receiving pulley to wind up the cable wire smoothly. Put the cable wire in the tray smoothly, and leave a short section (0.5~1m) in front of the dustproof mechanism base in order for weight installation (Fig.2).

8.2.4 Insert the end of the cable wire through the hanging bolt of the sensing weight and the short steel pipe which is used for crimping, and then go through the steel pipe again in a circle. Use the pliers (2 mm<sup>2</sup> for holes) to do the crimping firmly at the central steel pipe (Fig.3).

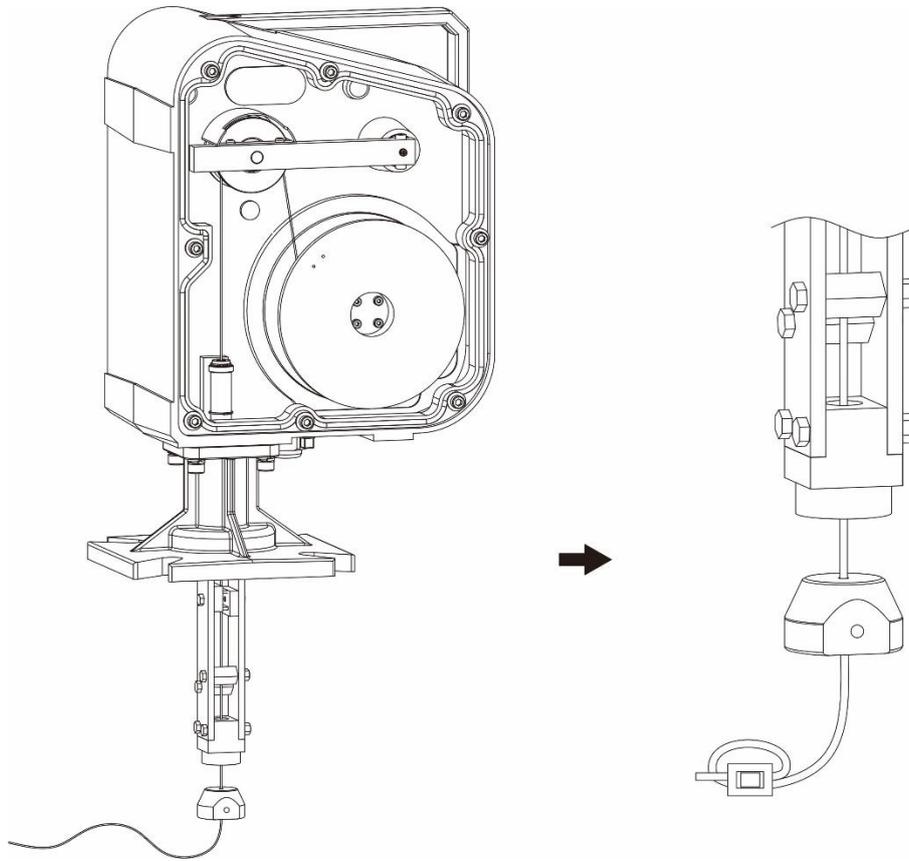


Fig.3

### 8.3 Sensing weight replacement

8.3.1 Put the U-shaped lifting ring on the top of the sensing weight, fix the equal-height screws and use the hexagonal wrench to tighten it. Put the M4 screw to go through in order from lifting ring, locating ring, iron chain, locating ring, lifting ring, and fix the arresting nut and tighten it firmly (Fig.4 & Fig.5).

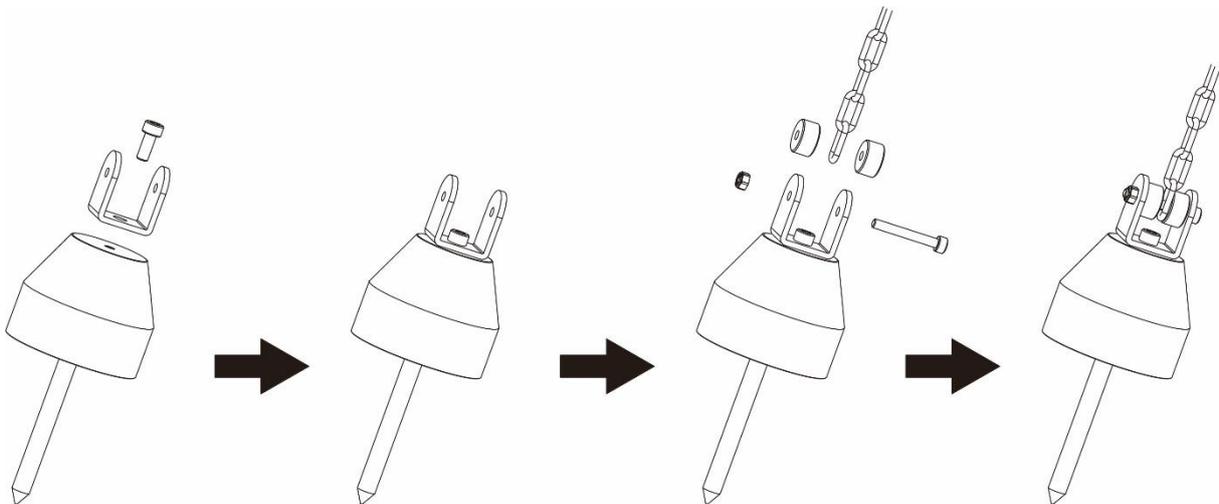


Fig.4

8.3.2 The operation of the U-shaped ring of the plastic Auto-Fall-Off sensing weight same as 8.3.1. The plastic sensing weight must be filled with the material at 0.9~1.0kg before use. When connecting, the head of the plastic weight is aligned with the socket and inserted to the end completely, try to pull the sensing weight to confirm that the installation is correct (Fig 6)

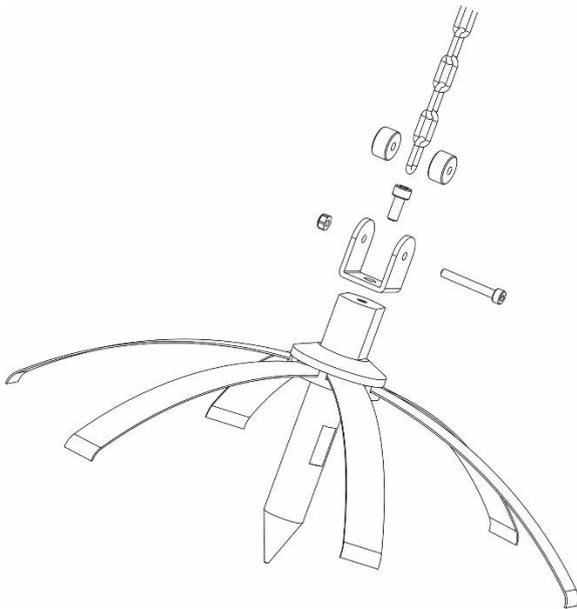


Fig.5

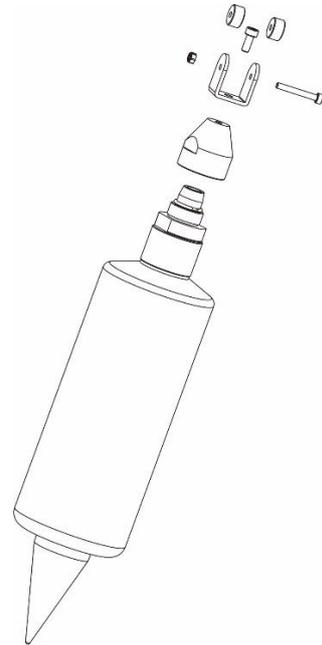


Fig.6

8.3.3 Pull the cable wire to fully retract the crimped steel pipe into the top of the hanging bolt, put the end of the iron chain to go through the hanging bolt of the sensing weight, Put the M4 screw to go through the hanging bolt, iron chain, and fix the arresting nut and tighten it firmly (Fig.7).

8.3.4 After finishing the above installation, turn on the power and the motor will rotate to collect the remaining cable wire into the receiving pulley (Fig.8).

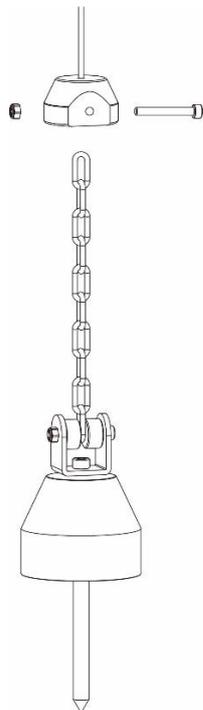


Fig.7

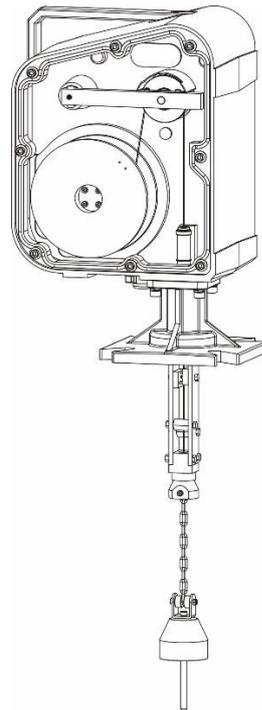
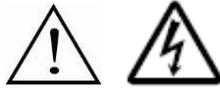


Fig.8

## 9. Troubleshooting



Issue	Possible Reason	Examination	Solution
No display (black screen) Indicators don't light	Screen saver program is executed	Push one of three buttons "ENT", "LEFT", "UP" to act the display	Push "ENT", "LEFT", "UP" to act and make LCM bright Push "RUN" to start the measurement
	No power input or no power on switch	Power switch status and power line connector	Turn on power
	Wire broken	Check the voltage at power input	Replace wire or provide correct power
	Construction mistake or circuit short	Check fuse on electric board	Replace fuse
	Power supply failure	Check the voltage of secondary power supply is 24 VDC	Replace power supply module or contact Blue Level
With display but not execute detection	External trigger wire broken (15, 16)	Check if RUN command can act or not	Repair wire at terminal 15,16
	Motor wire broken	Check the wire condition with motor	Replace motor wire or contact Blue Level
	High pressure in reservoir or storage, made the weight head can't droop down	Observe if gas or dust eject from EEX	Check the cover secure and fix the screw, or contact Blue Level
	Dust inside the housing, blocking and affect the movement of sliding rod.	Checking the housing for dust and sliding rod.	Cleaning the housing and remove dust, forbid to use any lubrication oil.
	Firmware failure	Restart it and get it normal, but it will fail randomly.	Contact Blue Level
Host is uncontrolled, continually releasing or receiving wire	Short circuit happened in terminal 15 & 16	Check terminal 15 & 16 for resistance value	Check wiring and remove short circuit
	It was influenced by other induced voltage nearby.	Check every wire for if any unstable voltage.	Use shielded cable and make sure it grounded well
Sensing weight only going down 20~25cm and back to standby	Magnet on sliding rod got off, can't sense position and system forces it to come back	Check magnet on top of sliding rod is completed or not	Contact Blue Level
Measurement result is quite different from actual result	There are damages in wire, inadvertently touch the switch as in measurement	Check whole wire if any obvious damage	Replace with new wire
	Impacted by filling materials as in measurement	If material filling protection function is connected	Start the protection function and avoid measurement as filling materials

Indicator Message: Broken	Cable Wire Broken	Check the cable wire	Replace cable wire and weight head
	Cable wire derail the hub of pulley	Check the pulley and cable wire	Reassembly cable wire and pulley follow instruction at section 8.2 & 8.3
	Low Alarm circuit close	Cable wire & weight head, pulley are in normal	Contact Blue Level
Indicator Message: Buried	Weight Head was buried	Check if the weight head was buried by observation window or dismounting the flange	Stop filling materials and wait for the restart automatically
	Magnet on sliding rod got off, can't sense receiving position and keep receiving with no stop.	Check magnet on top of sliding rod is completed or not	Contact Blue Level
	Relay switch for buried is malfunctioned	Steel wire and weight are normal in good condition.	Contact Blue Level if problem continues after reboot.
	Materials stuck on weight, too heavy to cause wrong signal.	Check the weight if it becomes too heavy.	Remove all the materials attached on weight and wire.
Indicator Message: KNOT	Cable stuck on the receiving pulley, can't work normally	Cable winded and stuck on the receiving pulley	Disassembling the receiving pulley and release the wire, power on again and the cable will be received
	The flexstrip cable is not connected.	The flexstrip cable was pulled out and not connected	Plug in the flexstrip cable and turn off the power. Restart the EEX
	The motor cable is not connected.	The motor cable was pulled out and not connected	Plug in the flexstrip cable and turn off the power. Restart the EEX
Indicator Message: Broken & Buried	The flexstrip cable is not connected well or components damaged.	Check and plug in the flexstrip cable well and reboot to back to normal	Contact Blue Level if same problem after reboot.

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