

Installation Manual



SYW Magnetostriuctive Level Gauge

Installation Manual of Level Gauge

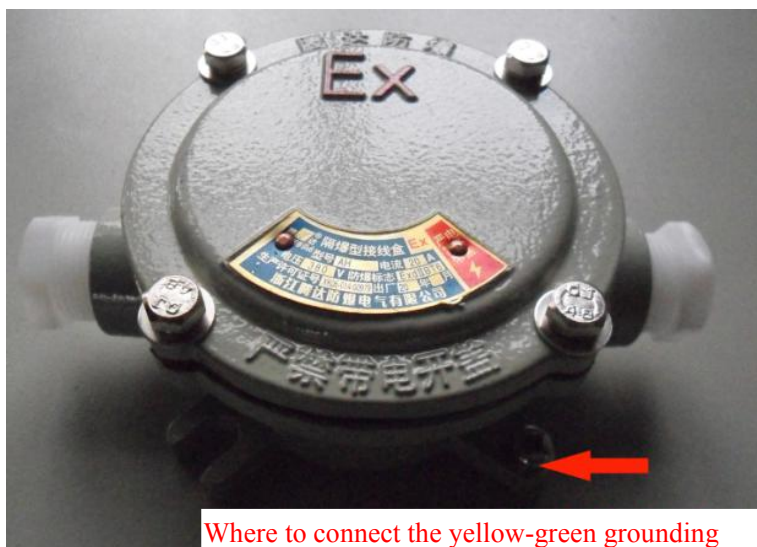
I. Preparations for Installation

1. View the goods to check the information of goods delivery.
2. Count the accessories according to the list in the accessory case and the file card of level gauge.

Particulars and Use of Main Accessories				
Name of Parts	Specification	Unit	Quantity	Function of Parts
Probe	SYW-A	Gen	N (contract quantity)	Sensing part of level gauge
Touch console	TCM	Tai	X (contract quantity)	Display part of level gauge
Blind plate joint	G3/4 internal & external wire	Ge	N*1	Used for blind plate sealing
Seal gasket	Φ23-Φ5-5	Ge	N*5	Used by all positions to be sealed
Reducing bend	G3/4 internal & external wire	Ge	N*1	Used for connection of blind plate joint with anti-explosion hose
Inner connection	G3/4	Ge	N*1	Used for connection of anti-explosion box and anti-explosion hose
Anti-explosion hose	G3/4, 900 mm	Gen	N*1	Soft connection
Anti-explosion box (two-head)	G3/4 internal wire	Ge	N*1	Used for wiring in dangerous zones
Grounding wire (with wiring terminal)	2 m	Gen	N*1	Used for grounding of anti-explosion box
Bridging copper bar	— — —	Piece	N*1	Used for bridging between blind plate and flange
Aviation plug wire (with seal ring)	2.5 m	Gen	N*1	Communication line for probe
Upper separator and lower separator	— — —	Set	N*1	Used to ensure vertical probe and prevent from impacting
Lower gasket	— — —	Ge	N*1	For separation of probe from oil tank
Buckle	— — —	Ge	N*1	To prevent the floating ball from falling off
Wire joint	— — —	Ge	N*5	For wiring among communication lines

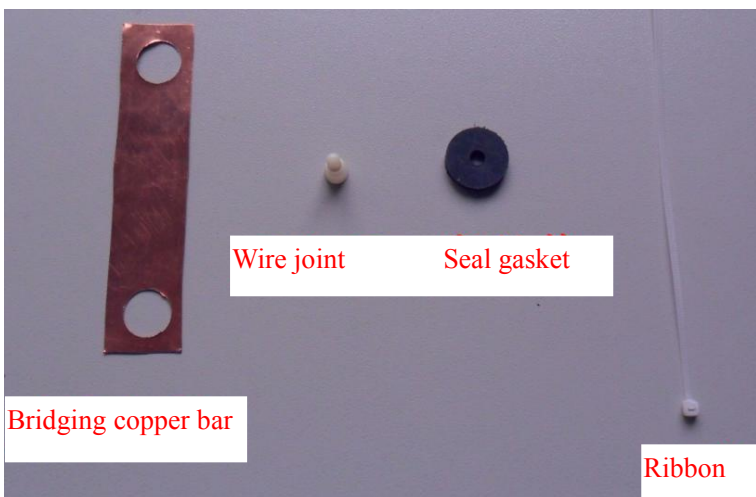
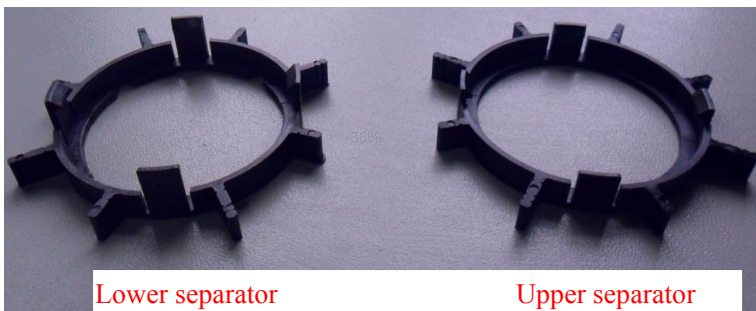
Ribbon	3*150	Gen	N*5	To fasten 2m grounding wire
Anti-explosion mud	---	KG	N*0.2 Kg	For sealing inside the anti-explosion box
Insulated tape	---	Roll	1	Used when required for wiring of communication line
Fluid-level floating ball	YM	Ge	N*1	Used by probe to measure the oil level
Gasoline floating ball	QS	Ge	Actual	Used by probe to measure the water level
Diesel floating ball	CS	Ge	Actual	Used by probe to measure the water level
Touching pen	---	Zhi	X*1	For operating console
Online communication line	4*0.75	Gen	1	For center control online (if any)
Expansion tube	---	Ge	4	For fastening of wall surface
Cross wood screw	---	Ge	4	For fastening of wall surface
<p>1. Interface floating ball QS + Interface floating ball CS = Fluid-level floating ball YM; 2. E.g., $\Phi 23$-$\Phi 5$-5, $\Phi 23$ is outer diameter of seal gasket, $\Phi 5$ is hole diameter of seal gasket and 5 is thickness of seal gasket.</p>				

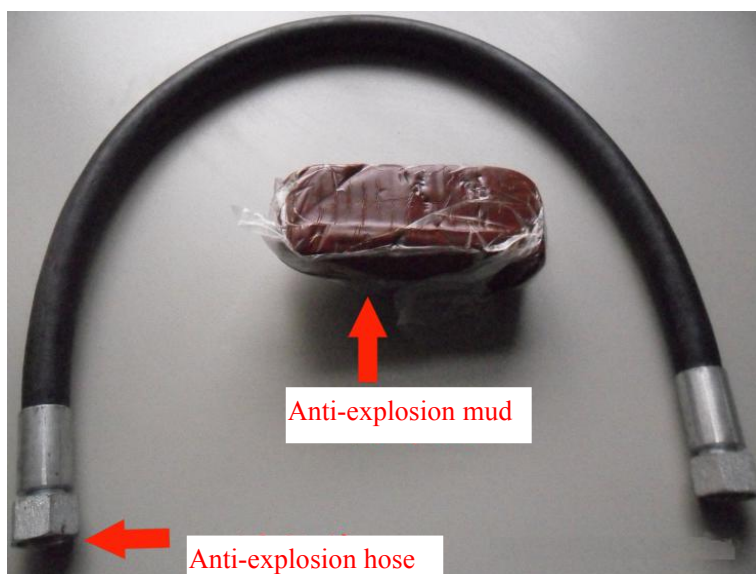
3. Real pictures of main accessories.



Where to connect the yellow-green grounding







4. Preparation condition of gas station:

- ① Stand pipe: generally it requires seamless steel pipe with 400 mm in height and 3 or 4 inch in specification, without such barriers as beam under the stand pipe. The stand pipe and the gauge hatch cannot stretch into the tank and the output inside the discharge mouth cannot face the level gauge;
- ② It requires galvanized pipe with G3/4 in specification of welding above the blind plate, 20 mm or so in height and with outer thread;
- ③ The conduit (G3/4 galvanized pipe) inside the manhole from the control room reserves a margin of more than 100 mm with outer thread at the end. The conduit cannot face the installed stand pipe of the level gauge directly and it keeps a distance of more than 200 mm from all objects inside the manhole to facilitate the installation of anti-explosion box;
- ④ The communication cable is of four-core shielded wire with $0.5 \text{ m m}^2 \sim 0.75 \text{ m m}^2$ in wire diameter as required.
- ⑤ Order of tank (tank No.) and type of oils;
- ⑥ Installation position of the console and the surrounding 220 V power supply to confirm whether the gas station has good grounding;
- ⑦ Check the circuit and mark wire number.

Attention: ◆If the stand pipe is not 400 mm high, measure the distance of from the stand pipe flange to the tank bottom. Generally the distance from the flange to the tank bottom = B value of corresponding probe + 360 mm, and the part above the tank cover must be no less than 200 mm high;

◆The stand pipe flange and the blind plate must be of uniform specification and equipped with corresponding bolts. Seal gasket must be installed between the blind plate and the stand pipe flange.

◆The control room must have good grounding.

◆The stand pipe must keep vertical to the earth.

5. Requirements for Safety in the Installation Site

① The installation personnel must wear antistatic work wear.

② It is prohibited to smoke in dangerous places or bring any lighter to the tank area.

③ Don't bring mobile phones in the tank area.

④ The tools must be held or placed gently without barbarous operation in the process of onsite installation and operation.

⑤ It is prohibited to wear or take off any clothes, comb hair, beat clothes or fight with each other in the dangerous explosion area.

⑥ It is prohibited to operate under the condition of storm wind or thunderstorm.

⑦ Extinguishers must be placed on the working site.

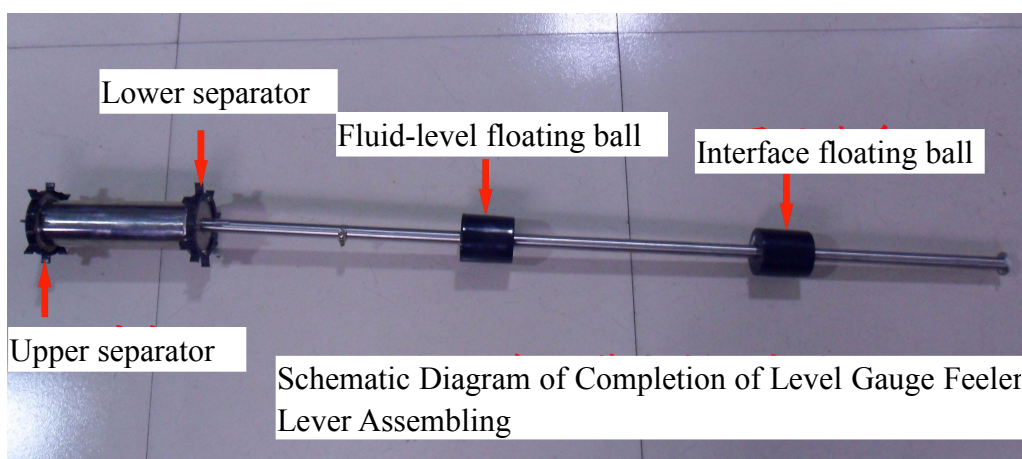
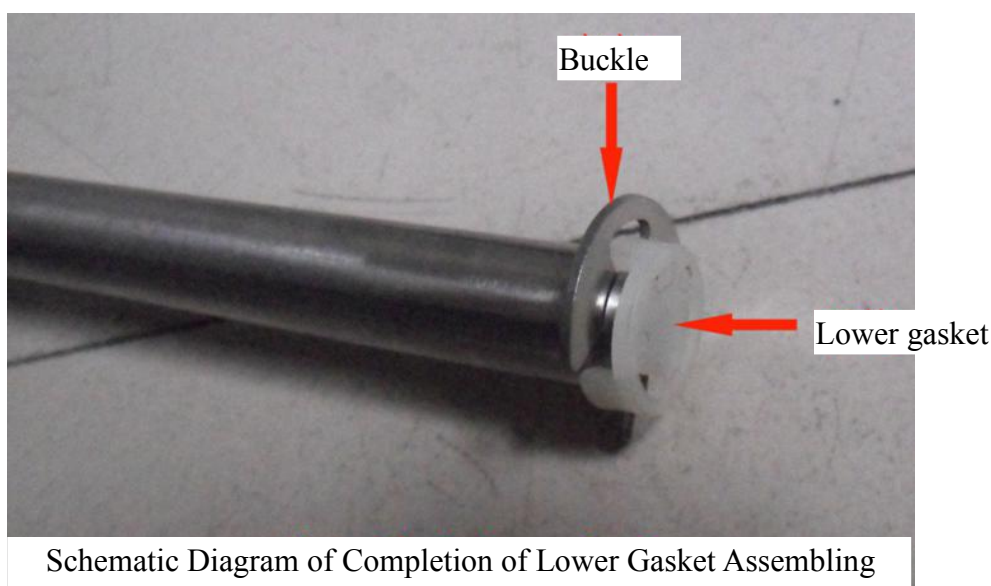
⑧ The opened tank opening must be covered with asbestos cloth.

II. Assembling the Parts

1. Assembling the feeler lever

Take out the probes and the demanded probe accessories (needing for every probe: 1 upper separator and 1 lower separator, 1 buckle, 1 lower gasket and 2 corresponding floating balls) for installation of probe accessories: as in the diagram

- ① Determine the probe corresponding to every tank according to the probe number;
- ② Stick the upper separator and the lower separator into both upper end and lower end of the upper shell respectively (the upper separator is thinner than the lower separator);
- ③ Put the corresponding floating balls through the probes according to the type of oils (every probe needs one YM floating ball, one QS floating ball or CS floating ball) with YM on top;
- ④ The bottom of the probes is fastened with lower gasket and snap ring to play a main role of insulating and prevent the floating balls from falling off.



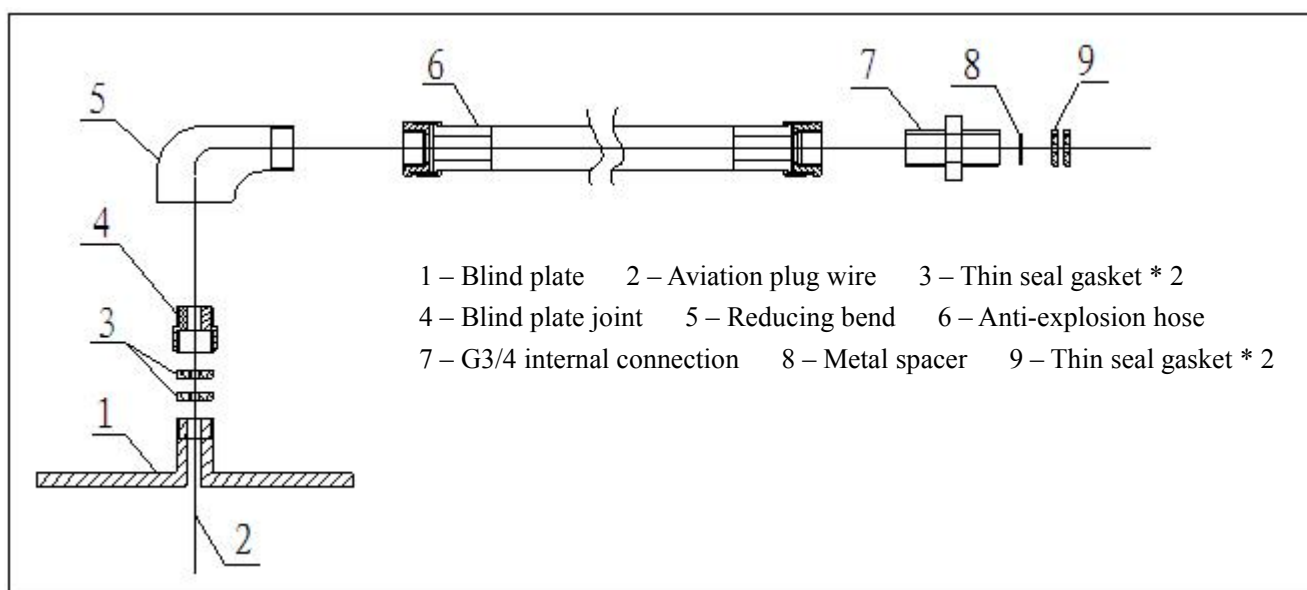
- Attention:** ◆ In general condition, the minimum number of probes corresponds to No. 1 tank or the last tank in the tank area and the others correspond in turn;
- ◆ The type of floating balls must correspond to the type of oils inside the oil tank.

Otherwise it will influence the normal work of the level gauge;

◆The side of the floating balls marking YM, CS and QS must face the electric cabin in the installation of the floating balls.

◆Slide the floating balls back and forth after completion of probe assembling to ensure that the floating balls will not be stuck or demagnetized.

2. Schematic diagram of assembling of blind plate kits



① Take out 2.5 m of aviation plug wire. Put the end with no aviation plug through the centre hole of the blind plate from the lower surface of the blind plate towards the upper surface of the blind plate (the upper surface is the side with thread head). The end with aviation plug is required to reserve 400 mm to connect the probe of level gauge;

② Use blind plate joint to coordinate with two thin seal gaskets in sealing at the blind plate head (as in the diagram). The blind plate joint shall be tightened;

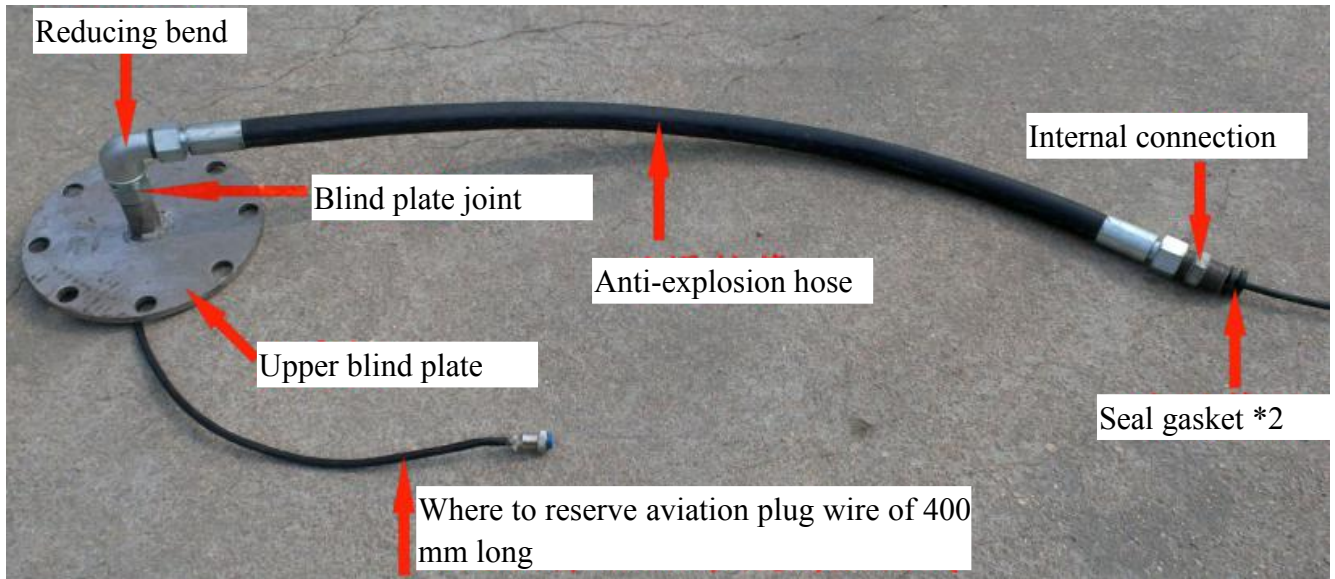
③ Install the reducing bend on the blind plate joint. Then fix one end of the anti-explosion hose at the reducing bend;

④ Connect the G3/4 internal connection at the other end of the anti-explosion hose without tightening;

⑤ Put the metal spacer and seal gaskets through the aviation plug wire as shown in the diagram.

So far, the assembling of the blind plate kits will have been completed.

Real diagram of assembling of blind plate kits:

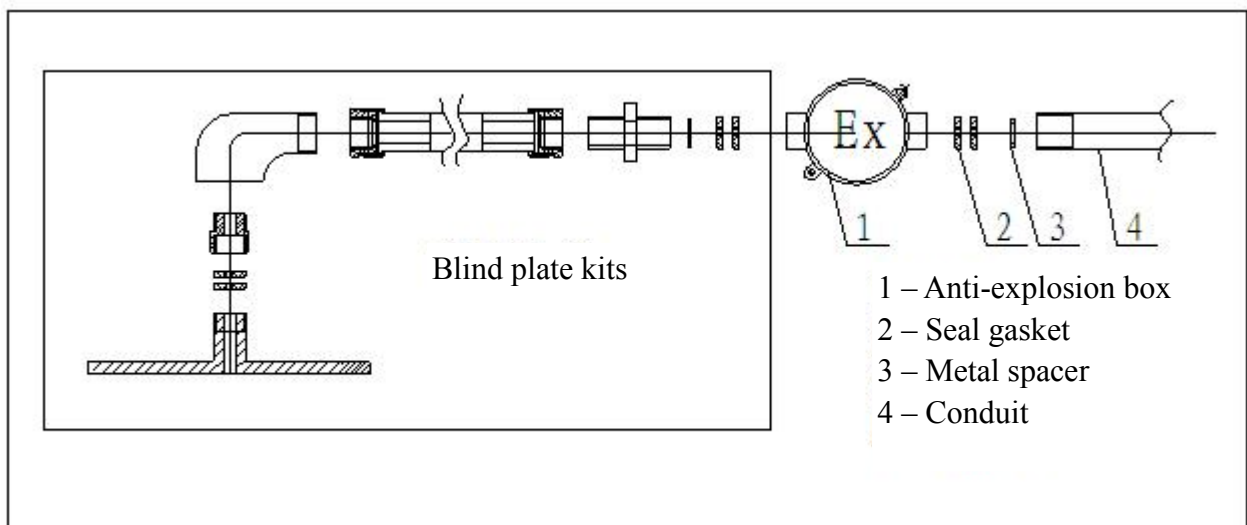


3. Installation of anti-explosion box and connection with blind plate components

① Loop the two seal gaskets and metal spacer on the communication line embedded inside the manhole. Then fix the anti-explosion box at the 3/4 inch galvanized pipe (conduit) joint and tighten it. The shielded wire from the control room reserves 150 mm or so inside the anti-explosion box;

② Take up the assembled blind plate kits. Fasten the end with internal connection on the kits to the other end of the anti-explosion box.

As in the diagram:



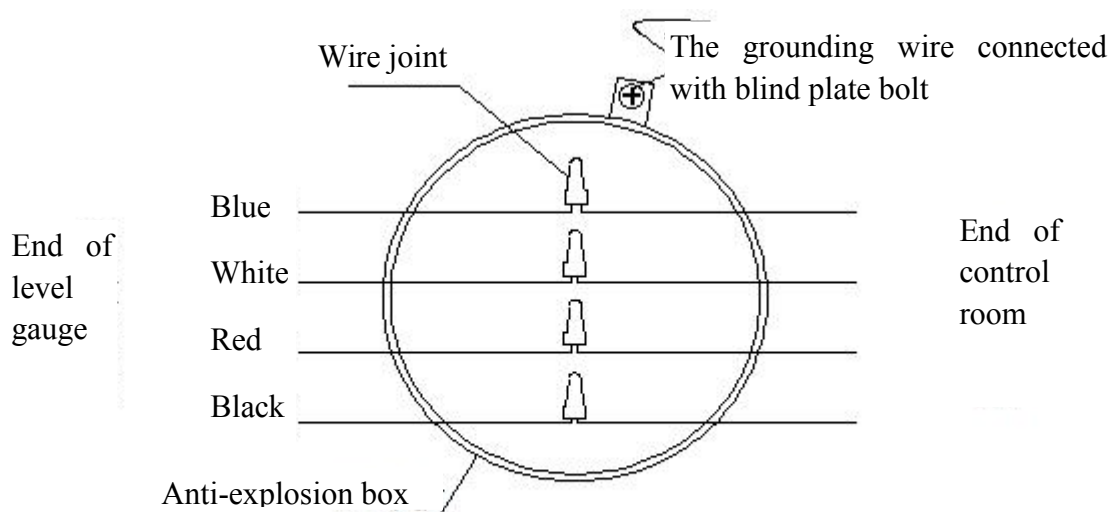
Attention: ◆ Please pay attention to protecting the aviation plug wire in the operating process. Scratch, abrasion and excessive distortion are strictly prohibited;

◆ In event of too thick shielded wire from the control room, it is required to expand the hole for the seal gasket.

◆ Use the metal spacer shown in the diagram to protect the seal gasket.

◆ The probe's aviation plug wire and the embedded wire reserve 150 mm of length inside the anti-explosion box.

4. Wiring operation inside the anti-explosion box: (Seen in the picture)



Wiring Diagram inside the Anti-explosion Box

- ① Connect the four cables of the aviation plug wire with the four corresponding cables from the control room respectively;
- ② The shielding net on both ends must be wrapped tightly with insulated tape to prohibit from exposure;
- ③ Compress the butt joint circuit with wire joint filled with silica gel to insulate the copper wire from the outside world;
- ③ Use anti-explosion mud to fully wrap the circuit junction inside the anti-explosion box and use anti-explosion mud to fill other space inside the anti-explosion box.
- ④ The seal ring as equipped must be installed between the cover of anti-explosion box and the cavity of anti-explosion box.

⑤ The four communication lines inside the aviation plug wire of the probe must correspond to the labels on the summary plate inside the console.

5. Other tasks in the tank area:

① Slide the fluid-level floating ball of the probe from top of the probe to bottom and from bottom to top respectively. Finally slide the two floaters of the probe to bottom of the probe;

② Then erect the probe and touch the stand pipe with the bare metal part of the probe (to discharge the static). After that, put the probe carefully inside the installed stand pipe of the level gauge while the electric cabin is not placed in the stand pipe;

③ Insert the aviation plug, which stretches out from the lower surface of the blind plate, on the aviation socket on the electric cabin and tighten it (with appropriate force in the tightening process, tightening by hand is advised);

④ Hold the pull tab to put the probe into the tank slowly till arrival at the bottom of oil tank;

⑤ Bridge the bridging copper bar on upper surface of the blind plate and lower surface of the stand pipe flange and connect it to the anti-explosion box by using yellow-green grounding wire.

Attention: ◆ Please pull more for several times after placing the probe into the tank to ensure it arrives at bottom of the tank;

◆ Please confirm that O-shape seal ring is equipped on the aviation plug;

◆ It is required to confirm that the whole aviation plug wire has been put in the stand pipe before tightening the screw of the blind plate, in order to ensure that the aviation plug wire will not be crushed and damaged in the process of fastening the bolt of the blind plate;

◆ Seal gasket must be placed between the blind plate and the stand pipe flange;

◆ It is important to note, in the process of installation of the aviation plug wire, that water is prohibited inside the aviation socket.

III. Installation of the Console

1. Burrow two 8 mm holes in the wall surface in the installation position of the console and nail

the expansion pipe as well as the wood screws in the accessories into the holes;

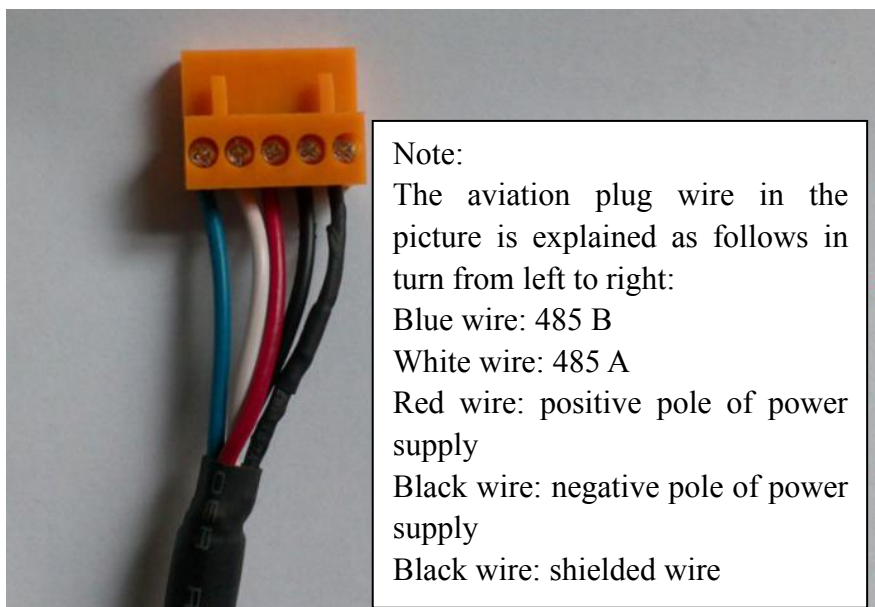
2. Fix the console at the two fixed screws in the wall surface;

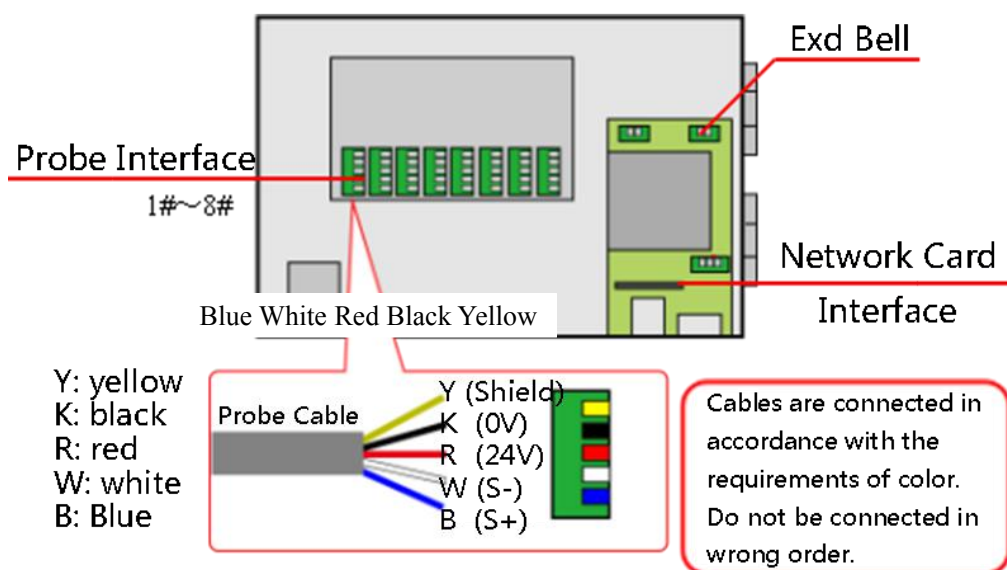
2. Penetrate the cables into the console in turn from left to right according to the label. Reserve appropriate wiring length, tighten and lock the nut;

3. Peel the thread end of every cable. Crimp it to the orange wiring terminal in the sequence as marked in the summary plate and then insert it to the summary plate inside the touch console.

4. If center control online is required, use 15 m of online cable to connect the central control serial port on the console with the serial port of the central control system.

Real picture of crimping orange wiring terminal:





Attention: ◆ The installation position of the console shall be far from electromagnetic interference area and damp area. Otherwise it may result in abnormal work of the console;

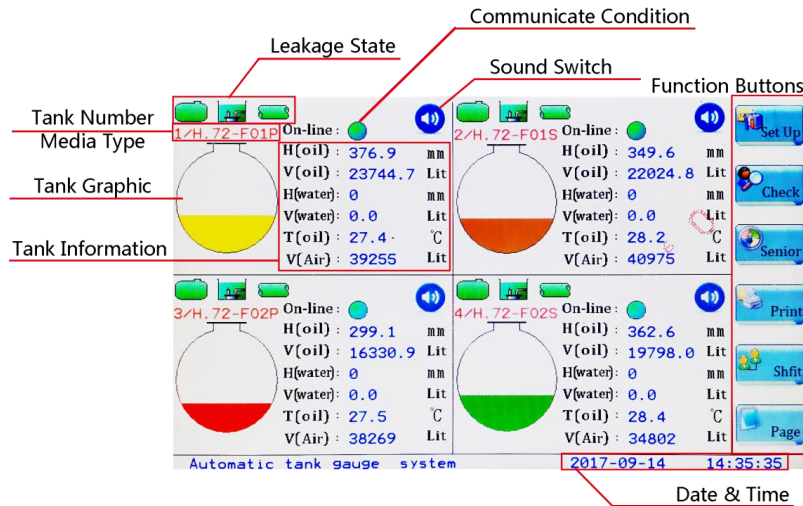
◆ Please ensure the crimping order conforms to inside of anti-explosion box when the communication line is crimped to orange wiring terminal;

◆ Loop the heat shrinkage tube for the shielding net before crimping to prevent from short circuit out of exposure.

IV. Commissioning of TCM-1 Console

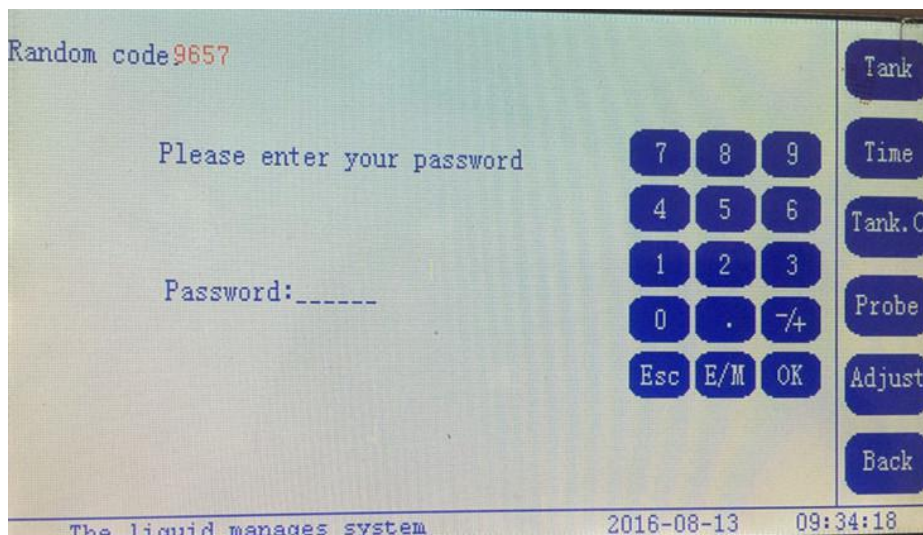
1. Startup test

Turn on power of the console. Confirm the communication status of the probe (the following diagram shows normal communication):



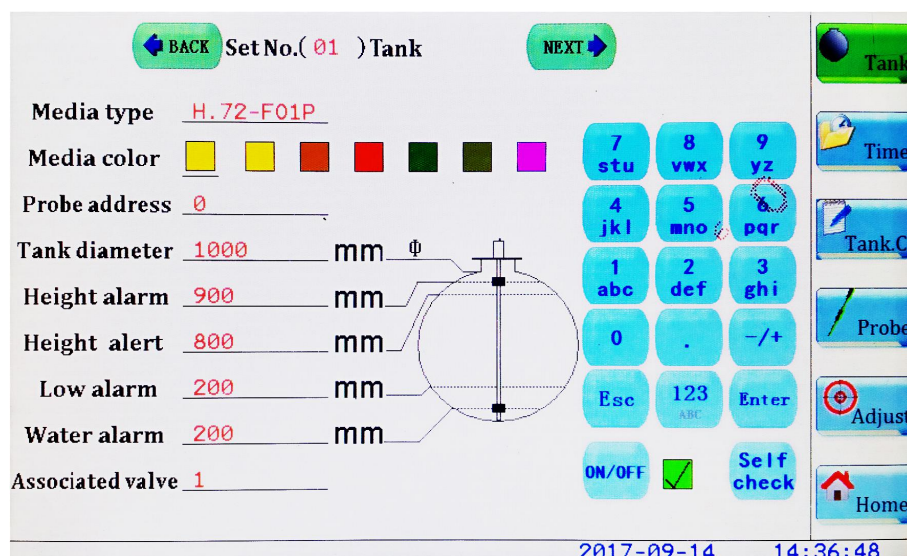
2. Set oil tank parameters

Click Set, then display the following interface, users need to enter password (about the password pls ask for manufacturer)



① Click the upper right corner to set and choose “ tank” as in the diagram.

Set oil type, tank height and alarm values of every tank according to the onsite condition;



Media type: means the the fuel name in the tank, click the keyboard to modify the fuel name, This console uses squared input mode (for example, if the media type is ‘pet01’, please click “123” to input English words, click “6”, “Enter”, double click “2”, “Enter”, double click “7”, “Enter”, click “123” to input numbers, click “0” and “1”, finally click “Enter”). If you make a mistake, use the “Esc” to remove the words.

Media color: choose different color for different tanks according users demands

Porbe address: began to 0, 0 means 1# Probe, 1 means 2#Probe, and so on (can click and modify directly on console according to the probe number, don’t forget to click OK after set each parameter)

Tank diameter: means the max height value in the tank volume table. (can click and modify directly on console according to the tank diameter)

Height alarm: the level is the highest level that the fuel can reach to, there can’t delivery fuel any more when the fuel reach to this level. (can be modified directly on console according to the users requiments)

Height alert this level is the highest safe level that the fuel can reach to, it will be danger if the fuel continues to be added.

Low alarm it means there need delivery fuel if it reaches to this level.

Water Alarm it means the water level in the tank will reach the lowest of fuel-immersed pump and there cannot refuel.

Self check: means the probe self check up, when there are some error with the fuel level display on console, click it, usually the display level will get right.

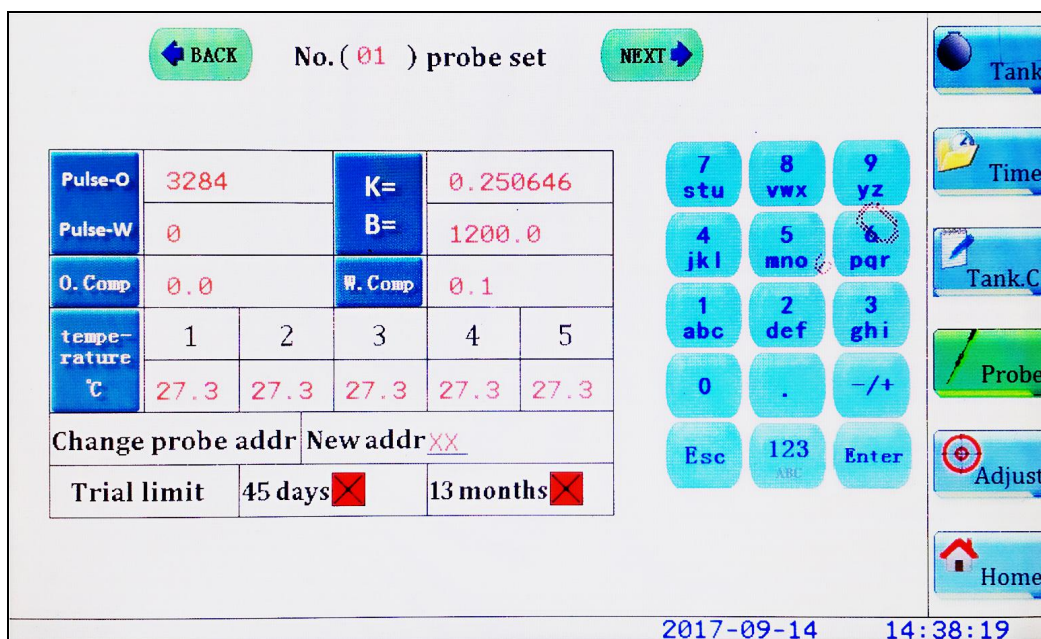
ON: means use and display this probe, if you dont want to display this probe, you can click the tick behind of it until it display a cross.

Tips: users need to click “Enter” after setup each parameter. Click “ON/OFF” after all

the parameters been setup, if displays “√”, indicating that this tank has been enabled. Then click “NEXT”, “BACK” to setup other tanks. (if don't want to modify click Esc)

3. Set probe parameter

Click Set, enter password, click Probe, display the following inter face, modify **O.comp** and **W.comp**.



Pulse-O: Oil compensation = actual oil height as measured by dipstick – oil height as shown in the console

Measure the actual oil height use dip stick after delivery(in which process it is prohibited to engage in the business of intake or discharge of the oil tank).

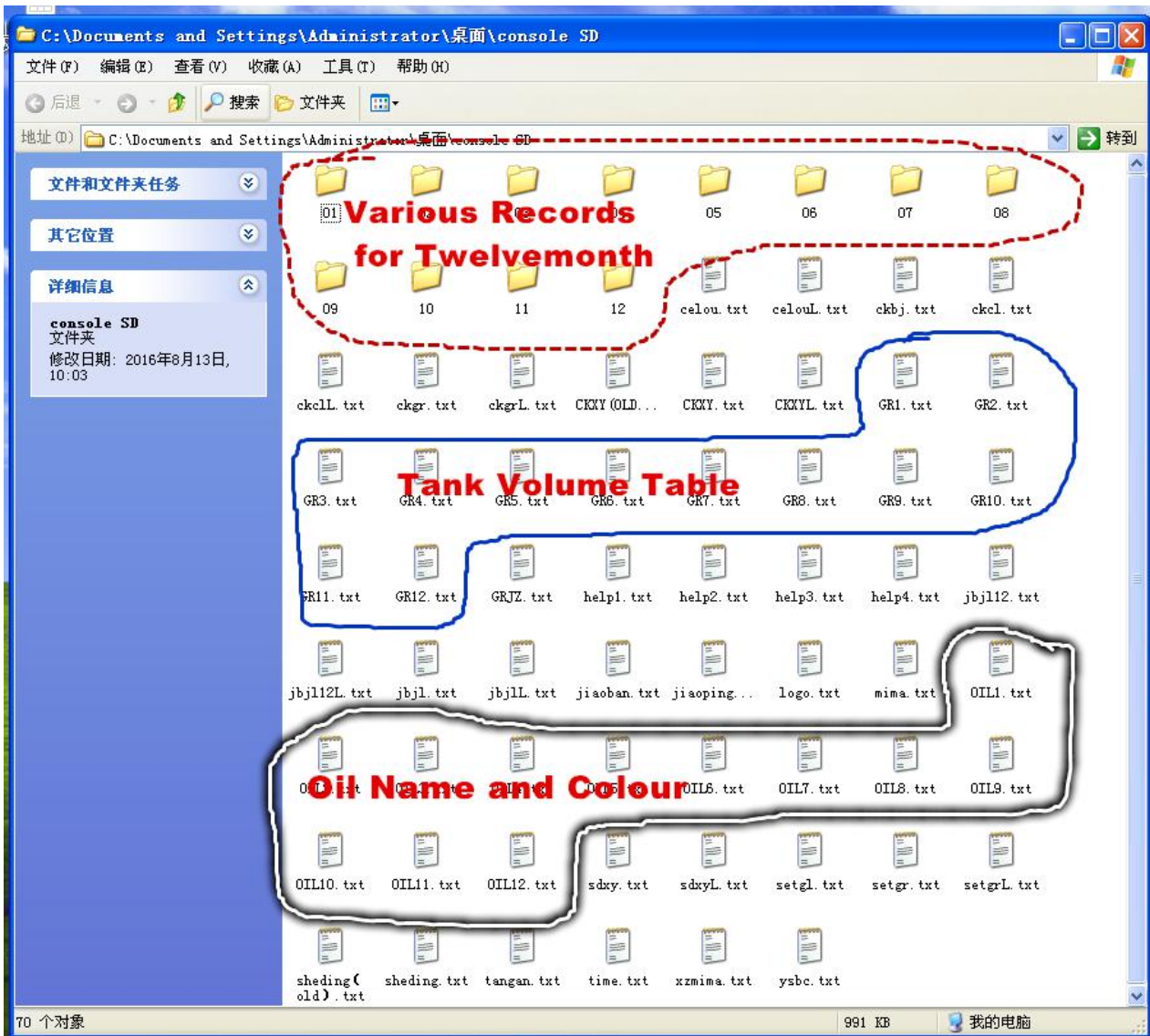
Pulse-W: If there are no water in tank, but console display water, then pls input - 50.0 behind the W.comp

Tips:

- ①click **O.comp** first, will display 0.0, click 0.0, then enter the modify value, then click ok
- ②click **W.comp**, display 0.0, click 0.0, enter -50.0, then click ok

4.About the SD memory card on the console

Turn off the console, take out the SD card from console, open it on computer. As follows.



Various records: 01-12,

Keep delivery report, alarm report, change shifts report, leak detection report, classification by month. 01 means January record, 02 means February record, and so on.

Tank volume table:GR1-GR12

If want to modify the No.1 tank's volume, open GR1, only need to enter the volume (the volume from 1cm 2cm 3cm.. to the diameter height), not need to enter height. The first volume can not enter 0.

Ttips :1.The above are the allowed to operate, don't modify others file, others are program

2. Don't modify any file's name.

Attention:

- 1. It is required to measure the oil tank first, before safety or tank calibration services, to detect the position of the stand pipe inside the oil tank. Separator shall be added in event of too short distance of the stand pipe from the tank bottom. Write clearly in the acknowledgement of installation information and indicate the immeasurable distance.**
- 2. Give notice to the gas station that the breather valve shall be replaced with normal-pressure breather valve and it shall be noted in the acknowledgement of installation information that the height problems arising in event of failure to replace do not belong to the free warranty scope.**