SM39TWB Cellular Network Type Wireless Temperature Transmitter Introductions

1. Characteristics

- Temperature monitoring limit alarms for oil pipeline temperatures in oil fields and individual well temperatures.
- Explosion-proof design：flameproof aluminum shell, intrinsically safe circuit board system.
- Protection grade：IP68，sealed waterproof design.
- Set with parameters such as alarm enable, limit values, delay, dead zone, maximum range, minimum range, number of decimal places, upload frequency, acquisition frequency, and change alarm.
- LED indication：Reset indication, configuration mode indication, network access indication, data acquisition indication.
- Four-and-a-half-digit LCD display：temperature data, battery capacity chart, limit alarms, etc.
- Adjustable installation direction：adjusted by connecting to the on-site pipeline valve through a union or adapter.

2. Performance index

1) Working environment temperature: -40 to 70℃.
2) Environmental humidity: 0-95%RH, no condensation.
3) Protection grade：IP68.
4) Explosion-proof mark: Ex ib II C T4 Gb, Qualification Certificate：CE18.2230X.
5) Power supply: ER34615 lithium thionyl chloride battery(enforce standards: SJ52278/1), two primary cells are connected in parallel. Capacity: 3.6V 38Ah. Battery connector SM-2P（receptacle: Pin 1 positive, pin 2 negative) is connected to the instrument. Power supply voltage range: 3.0V～3.6VDC.
6) Battery continuous working time：≥1 year（temperature collection frequency: 1times/min. Communication frequency: 1 times/h）.
7) Battery replacement method：open the back cover and quickly replace it through the standard SM-2P interface.
8) Long-term stability：drift，±0.1%FS/ year.
9) Measurement performance：range: 0～150℃、0～300℃、-50～500℃, accuracy: 0.5% F.S, (It can be customized according to actual needs), comply with the relevant technical standards of GB/T 28473.2 and JJF1183.
10) Temperature sensor: PT100 platinum resistance packaging, temperature overload capacity 150%FS.
11) Process connection interface：Probe type process connection thread M20X1.5，surface

mount sensors are installed using clamps(The size of the clamp can be customized), Clamp material is made of 304 stainless steel, The length is more than 1 meter and connected with a metal hose.

12) Communication method：NB-IOT or 4G（Compatible with 3G/2G）.
13) Communication protocol: follow the *"Communication Protocol of Cellular Network Wireless Temperature Transmitter"* to achieve the access of the DMZ server in the oilfield.
14) Online debugging and setting functions：Under the condition of online installation without uninstallation, the sensor instrument panel can be debugged and set through the miniUSB interface of the computer. Set the data content included：

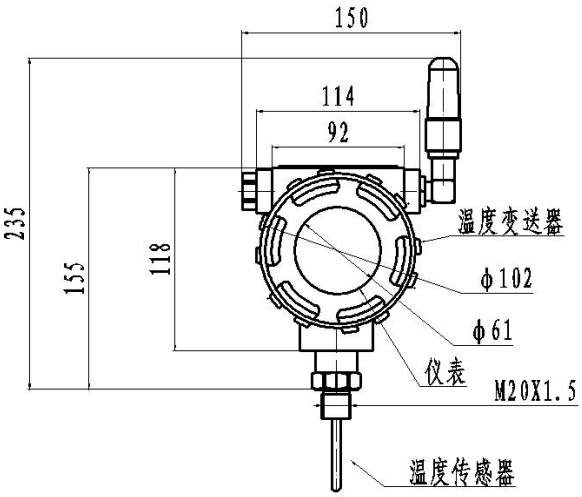
➢ Remote communication working parameters：Server IP address and port number.
➢ Measure working parameters：alarm enable, limit values, delay, dead zone, maximum range, minimum range, number of decimal places, upload frequency, acquisition frequency, and change alarm.
➢ After the instrument is powered off, set data retention.

15) Online upgrade：It is capable of being installed without uninstallation, and can be operated by a computer through the configured serial port.
16) LCD display：LCD display area: L × W =45×35mm, base color: green. The displayed content includes real-time measurement values, temperature units, instrument ranges, battery power, voltage, and signal strength.The decimal point of the real-time measurement value can be set, 2 decimal places are reserved by default.
17) Instrument housing：aluminum alloy material, the sealing ring (gasket) of the case is made of silicone rubber, apply Vaseline to the front and back cover threads, the dial diameter is 60mm and the appearance color code is RAL5007.
18) Outline size：L × W × H =150×130×235mm（MAX）(The probe length is not included)
19) Sampling interval： 1～60min.
20) Sending interval：5～1440min.

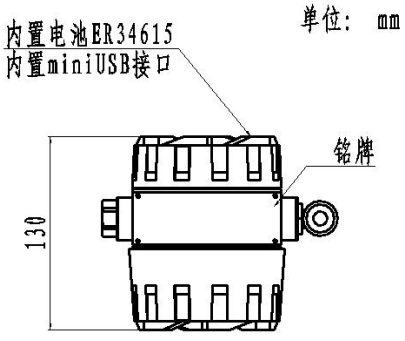
3.Explosion-proof certification parameters

➢ Explosion-proof certificate number：CE18.2230X
➢ Explosion-proof mark：Ex ib ⅡC T4 Gb

4. Appearance, structure and function

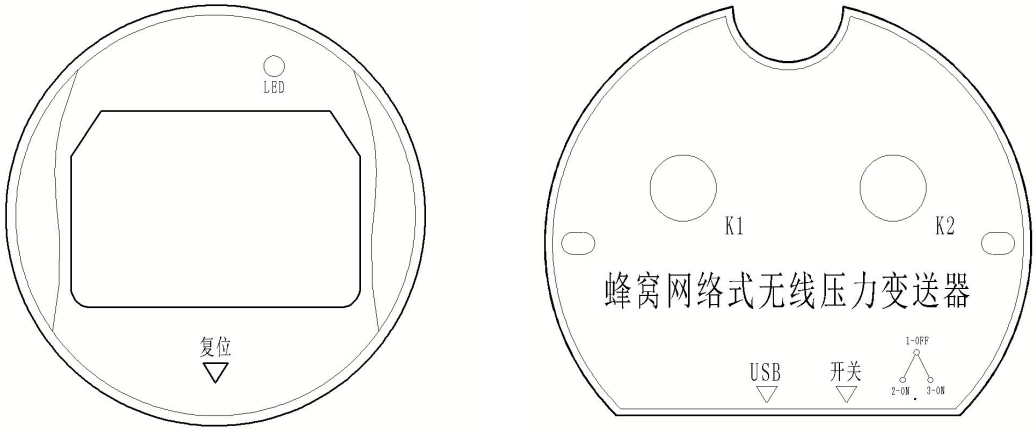


a 正视图



b 俯视图

SM39TWB External structure diagram



SM39TWB Front panel and rear panel function diagrams

Front panel LED：There are two colors, red and green. Red represents the temperature collection status and the sleep-to-wake-up status, while green LED represents the chain-building status for the NB-IOT network.

Front panel reset：through a magnet, directly below the front cover of the shell, with the magnet pointing upwards towards the reset arrow, stabilize for 3 to 5 seconds, then remove the magnet. The red LED light will flash three times, and the LCD display 8888 will also flash simultaneously three times, indicating that the instrument has successfully reset. The main purpose of reset is to enter the instrument to modify internal parameters, or refresh the current temperature value, and refresh again to establish a network connection.

Open the back cover of the instrument. Inside the back cover, there is a battery, buttons,a switch and a USB debugging port, the functions are introduced as follows：

Rear panel K1: Due to the long reporting cycle of the instrument, during the debugging process, the K1 key can be pressed, and the instrument will actively establish a network connection and report the current set of temperature data. K1 is mainly used to debug whether the network is working properly.

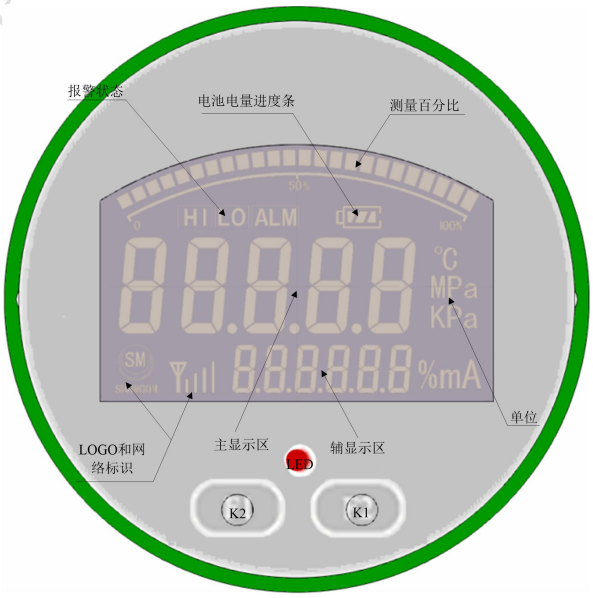
Rear panel K2：Due to the long reporting cycle of the instrument, some application sites need to implement real-time numbering for observing the current temperature. During the debugging process, the K2 button can be pressed, and the instrument will actively and continuously collect the current temperature for 300 seconds, with the LCD screen synchronously refreshing in real time. This function only collects data on-site and does not upload it. K2 is mainly used for on-site temperature debugging.

Rear panel switch：The switch is divided into three positions: upper, middle and lower. The middle position is in the off state, while the upper and lower positions are in the open state.

Rear panel USB：USB + debug software，it is convenient to input IP address，network number and other debugging parameters. For details，please refer to the debugging software manual.

Replacement of the rear panel battery：first，turn off the power switch. Then，unscrew the two M3 knetting screws on the left and right by hand. Next，pull out the upper cover of the K1-K2 circuit board vertically. Disconnect the black plug of the battery SM，replace it with a new battery，and reinsert the SM plug. Then，gently insert the K1-K2 circuit board vertically towards the pins. Finally，manually screw on the two M3 knetting screws. When operating the entire process of turning on the switch，please note that the K1-K2 circuit boards can be gently unplugged and plugged in. Finally，please tighten the back cover.

The physical photo is as shown in the following picture：



Alarm status	Display when an alarm is generated (The limit alarms are not displayed simultaneously), only the alarm conditions of the physical quantities displayed in the main display area are shown.
Battery power	Display the battery voltage according to the battery power.
Measure percentage	The percentage of the measured value within the range.
LOGO and web identifiers	The LOGO is always displayed, and the network identifier is shown according to the actual network status.
Main display area	It is used to display the value of the current physical quantity, such as pressure or temperature, with unit symbols.
Auxiliary display area	It is used to display auxiliary information, such as the unit logo, the online identification of NB-IOT signals, battery voltage, etc.
Units	According to the type requirements of the instrument, the three physical dimensions of Mpa, Kpa and ℃ can be set.

5.On-site installation and usage instructions

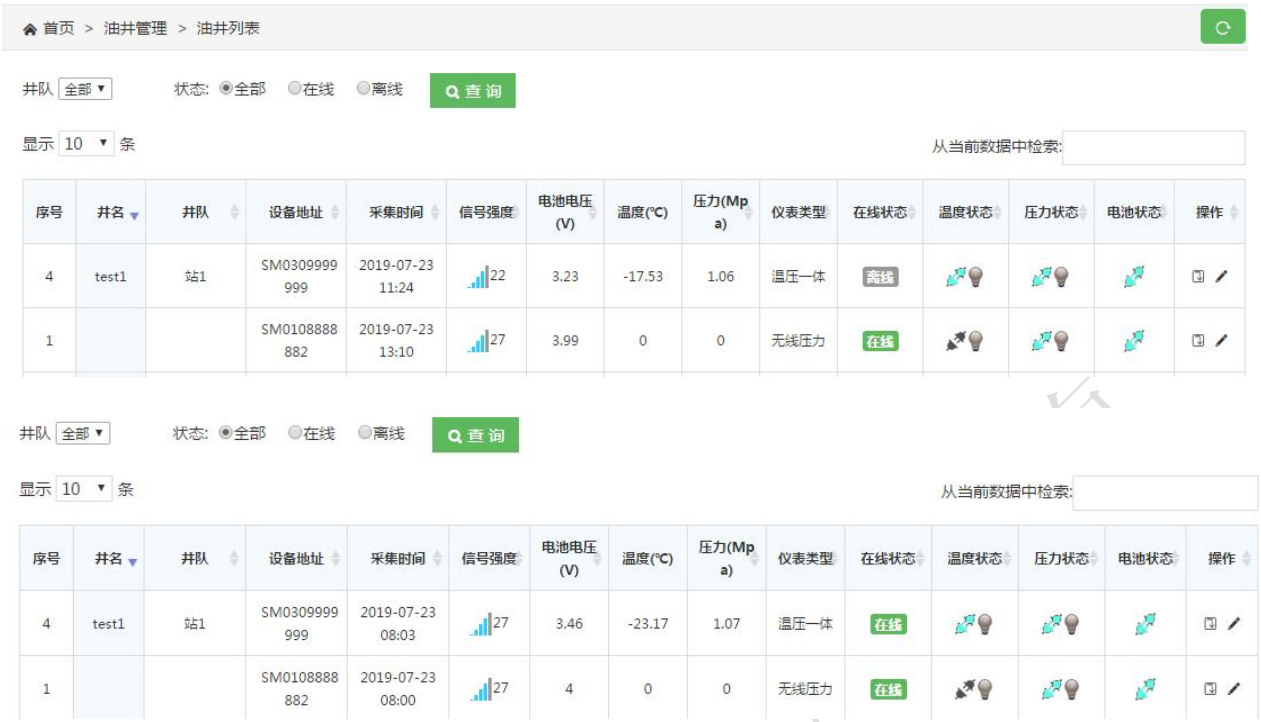
5.1.All transmitters have undergone digital calibration, and there is complete consistency and interchangeability among different transmitters.

5.2.During transportation, all the transmitter batteries are in the disconnected state. When installing the temperature transmitter on site, the back cover of the meter head needs to be unscrewed, the battery switch turned on, and the protective sleeve should be tightened to prevent water leakage.

5.3.Honeycomb network type temperature transmitters are installed on the pipelines
（1）Pipeline shutdown, pressure relief and emptying. Make a hole on the pipe that is slightly larger than the outer diameter of the blind pipe sleeve of the sensor probe.
（2）Insert the blind pipe sleeve vertically from the opening to the bottom of the pipe, and then seal and weld it around the hole to the pipe.
（3）Inject heat transfer oil into the blind tube sleeve, approximately half the tube.
（4）Insert the temperature sensor probe into the blind tube sleeve, adjust the direction of the meter head, and tighten the union with a wrench to restore the pipeline transportation.

5.4.After the installation of this cellular network wireless temperature transmitter is completed, the network parameters can be set through the buttons or the debugging fixture.

5.5.When the transmitter is not in use for a long time, the temperature transmitter can be set to sleep mode through the debugging fixture, (During the process of the transmitter leaving the factory and being stored in the warehouse, it is uniformly set to sleep mode or off state. On-site, parameters need to be adjusted and activated before it can be used normally). The online list of the debugging software interface is as shown in the following figure：



6. Precautions

6.1. The battery model used in this product is ER34615M-3.6V38Ah. The use of other types of batteries is prohibited.

6.2. The antenna housing of the product is made of plastic and poses a potential risk of static electricity! Avoid friction during use! Please wipe with a damp cloth when cleaning!