

## Safety Precautions

⚠ Temperature sensor/ transmitter shall be installed by professional engineers, technicians and other qualified personnel, please read carefully the content and important information provided by this installation guide and label before installation.

⚠ Temperature sensor / transmitter is powered by an external power supply, the power supply should be in accordance with relevant standards stipulated by energy limitation circuit, and pay attention to the high-voltage that may exist in the circuit.

⚠ Using temperature sensor/transmitter in dangerous situations, product installation, using and maintenance should comply with installation guide and relevant provisions of national standards.

⚠ Attention please! Disassemble the instruments under the condition of normal atmospheric pressure only.

## Label

|   |                        |
|---|------------------------|
| <b>LEEG</b> temperature transmitter 2016/05/26                      |                        |
| MN:LG200-WRT-R1-T1R3-FC-Q2-G6M01-D2L0500<br>SN:1605-086-018-2-C1236 |                        |
| 1 IN: -20 ~ 100°C   | 5                      |
| OUT: 4 ~ 20mA   | 6                      |
| ACC: 0.5%   | 7 ExeIICTG GVB16.1606x |
| 2 SUPPLY: 24VDC   | 8 1/: +                |
| Φ=8mm   | 9 2/: -                |
| L=500mm   |                        |
| Shanghai LEEG Instruments Co.,TLD.                                  |                        |

## i Important information

- 1 Measuring range
- 2 Power supply
- 3 Signal outline type
- 4 Explosion proof mark
- 5 Certificate

## Product Usage

To ensure measurement accuracy, the influence of medium flow direction, wall thickness and outer shape of protection tube, insertion depth, as well as pipe material, heat insulation material of container insulation layer should be considered when install temperature sensor/ transmitter.

## Horizontal pipe installation



Protection tube should contact media obliquely and reversely, the insertion depth should be half of the pipe diameter at least.

⚠ **Angle of inclination: 45- 90°**

## Bending pipe installation



The axis of protection tube and vertical pipeline should be consistent. Contact media reversely and the insertion length should be half of the pipe diameter at least.

## Install at top of container



The protection tube should be inserted with enough length to avoid error caused by temperature stratification.

## Install at side of container



The protection tube should be inserted with enough length to avoid error caused by contacting the wall of container.

## Direct installation

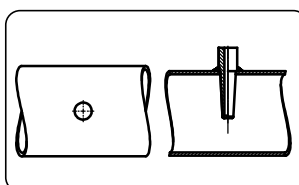


Light-weight pressure transmitter can be mounted directly on the pressure leading tube. Bracket is not needed.

When using a spanner to screw hexagon bolt, the maximum torque force can not exceed 50Nm.

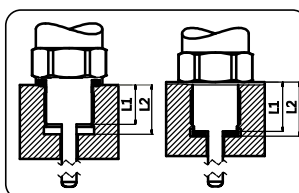
## Process connection

### Welding



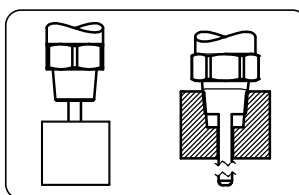
Holing on the pipeline according to the protection tube outer diameter. Insert appropriate length when welding.

### Straight thread



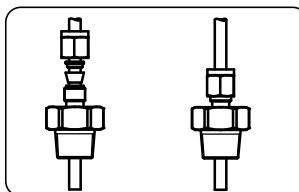
Adopting gaskets roots sealing, the thread length should be less than the base length( $L_1 < L_2$ ); adopting gaskets end face sealing, the thread length should be more than the base length( $L_1 < L_2$ )

### Taper thread



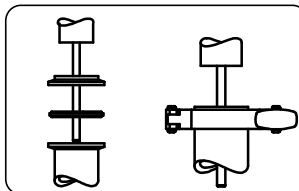
Sealing with teflon tape or sealant glue. When thread lock hard, there is a small part of space

### Movable thread



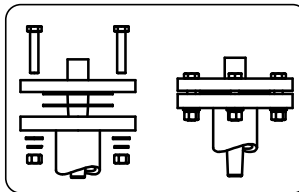
Matched movable thread can realize insertion length adjustment and low-intensity seal.

### Tri-clamp



Usually choosing gaskets with material of PTFE, silicon rubber and FKM which conform to hygienic standards

### Flange



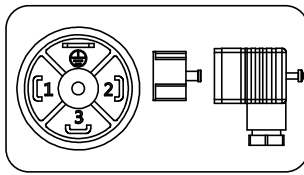
Choosing gaskets according to medium features and temperature range and lock evenly.

⚠ **Hygienic process connection Tri-clamp is approved by 3-A hygienic certificate.**

⚠ **The gaskets of tri-clamp and all the wetted parts conform with FDA standards.**

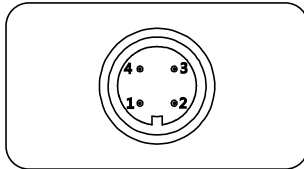
## Electrical connection

### DIN43650



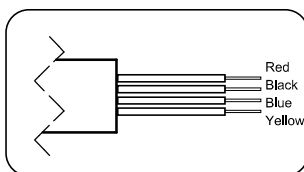
| Label | Two wires | Three wires | Four wires |
|-------|-----------|-------------|------------|
| 1     | Power+    | Power+      | Power+     |
| 2     | Power-    | Power-      | Power-     |
| 3     |           | Signal+     | Signal+    |
|       |           |             | Signal-    |

### Aviation plug(M12\*1 - 4 pins)



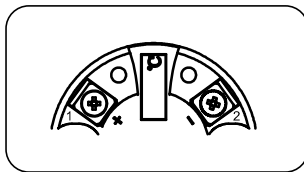
| Label | Two wires | Three wires | Four wires |
|-------|-----------|-------------|------------|
| 1     | Power+    | Power+      | Power+     |
| 2     |           |             | Signal-    |
| 3     |           | Signal+     | Signal+    |
| 4     | Power-    | Power-      | Power-     |

### Cable outlets



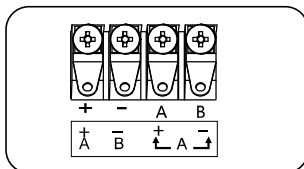
| Label  | Two wires | Three wires | Four wires |
|--------|-----------|-------------|------------|
| Red    | Power+    | Power+      | Power+     |
| Black  | Power-    | Power-      | Power-     |
| Blue   |           | Signal+     | Signal+    |
| Yellow |           |             | Signal-    |

### Terminal bed



| Label | Two wires |
|-------|-----------|
| 1     | Power+    |
| 2     | Power-    |

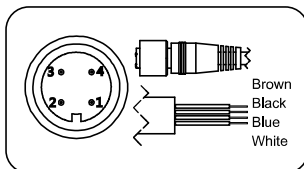
### Module terminals-four terminals



| Label | Two wires | Three wires | Four wires |
|-------|-----------|-------------|------------|
| +     | Power+    | Power+      | Power+     |
| -     | Power-    | Power-      | Power-     |
| A     |           | Signal+     | Signal+    |
| B     |           |             | Signal-    |

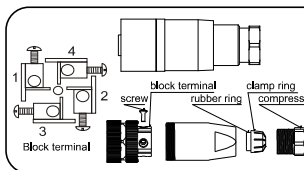
## Electrical connection accessories

### Aviation plug (with cable)



| Label   | Two wires | Three wires | Four wires |
|---------|-----------|-------------|------------|
| 1/Brown | Power+    | Power+      | Power+     |
| 2/White |           |             | Signal-    |
| 3/Blue  |           | Signal+     | Signal+    |
| 4/Black | Power-    | Power-      | Power-     |

### Aviation plug (without cable)



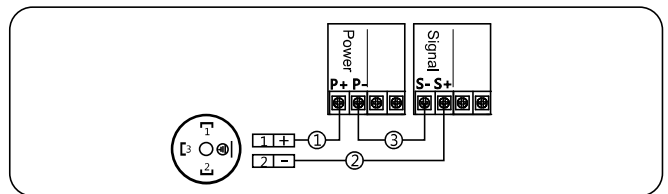
| Label | Two wires | Three wires | Four wires |
|-------|-----------|-------------|------------|
| 1     | Power+    | Power+      | Power+     |
| 2     |           |             | Signal-    |
| 3     |           | Signal+     | Signal+    |
| 4     | Power-    | Power-      | Power-     |

⚠ The electrical connection of hygienic pressure transmitter usually is aviation plug. The wiring method is "two wires" as above electrical connection table shows.

⚠ Please note! If there are any updates, please refer to the label for specific signal outline type. For signal outline type of temperature sensor please refer to the label.

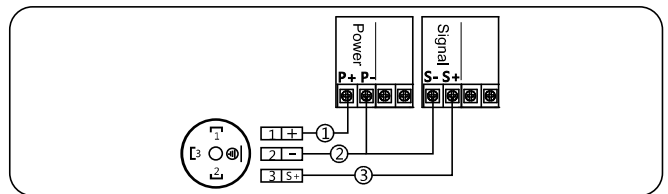
## Signal connection

### 4-20mA two wires (DIN43650)



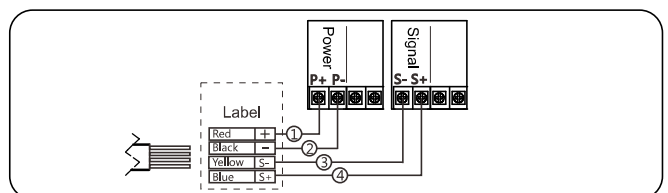
- 1 Connect the positive power supply (P+) to the positive power supply (P+) of temperature transmitter (terminals 1);
- 2 Connect the negative power supply (P-) of temperature transmitter (terminals 2) to the positive signal module (S+);
- 3 Connect the negative signal module (S-) to the negative power supply (P-)

### Three wires current/voltage signal (DIN43650)



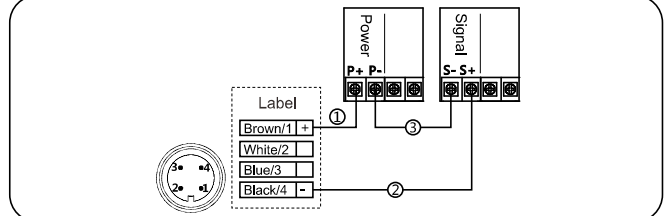
- 1 Connect the positive power supply (P+) to the positive power supply (P+) of temperature transmitter (terminals 1);
- 2 Connect the negative power supply (P-) of temperature transmitter (terminals 2) to the negative power supply (P-), and connect the negative signal module (S-) to negative power supply (P-);
- 3 Connect the positive signal module (S+) of temperature transmitter (terminals 3) to the positive signal module (S+);

### Four wires, current/voltage signal (cable)



- 1 Connect the positive power supply (P+) to the positive power supply (P+) of temperature transmitter (red wire);
- 2 Connect the negative power supply (P-) of temperature transmitter (black wire) to the negative power supply (P-);
- 3 Connect the negative signal module (S-) of temperature transmitter (Yellow wire) to the negative signal module (S-);
- 4 Connect the positive signal module (S+) of temperature transmitter (blue wire) to the positive signal module (S+).

### 4-20mA two wires (aviation plug with cable)



- 1 Connect the positive power supply (P+) to the positive power supply (P+) of temperature transmitter (terminals 1/brown wire);
- 2 Connect the negative power supply (P-) of temperature transmitter (terminals 4/black wire) to the positive signal module (S+);
- 3 Connect the negative signal module (S-) to the negative power supply (P-)

## Power supply

Independent linear direct-current power supply is suggested to be adopted for the power supply of temperature transmitter, over large resistive load will result in a large pressure drop, so it requires to calculate the all-in resistance of signal cable, display meter and other record and display equipment, to ensure the voltage provided to the temperature transmitter accord with normal operating requirements.

- Standard current signal output: 12-30VDC,
- 1~5VDC voltage output: 12-30VDC.

## Grounding

- Using cable with shielded twisted-pair signal has the best effect. To avoid ground loop, shielded layer adopts single-end grounded.
- Transient resistance built-in module is effective only in the case of good grounding. Metal shell and internal grounding terminals are used to the nearest grounded directly

## Cable protection system

### Standard protection system



In order to avoid the liquid flowing along with the cable to flow into the terminal box or result in waterproof joint effusion, an U-shaped ring needs to be configured between pull box and temperature transmitter as the picture shows,

and please ensure the U-shaped bottom is under the temperature transmitter. Considering the maintenance and replacement, enough cable length needs to be reserved.

### Flexible explosion-proof tube protection system



Using flame proof temperature transmitter in dangerous situations, please use metal flexible explosion-proof tube to connect the signal cable into pull box and lead to the safety zone.

## Maintenance

Requires no maintenance

## External cleaning

Please notice the following when cleaning:

- Use washing agent which will not damage to the instruments surface and seal ring.

## Transportation / storage

- Do not store at outside
- Keep dry and dust-free
- Do not expose to the corrosive medium
- Avoid solar radiation
- Avoid mechanical shock and vibration
- Storage temperature: -40~100°C
- Maximum relative humidity: 95%

## EMC statement

- EMC equipment instructions 2014/30/EU.
- CE mark suggests the instruments are in line with EU standards
- Users need to ensure the whole equipment conform to all the applicable standards.

## Retransport

- Keep clean of the temperature transmitter. Stay away from any dangerous medium!
- Please adopt proper package to avoid damage in transportation.

## Exception handling

- Measurement signal is abnormal which should judge the process pressure is abnormal, measuring system error or influence of installation environment or abnormal in the pressure transmitter, then analyze the reason and take corresponding measures.
- No signal output, process pressure changes but no measurement corresponding change, or change does not correspond, it may be an abnormal pressure transmitter, it needs to check the power supply voltage, wiring, power consumption and load resistance whether they meet normal operating requirements. Also need to check if there is leaks and pressure impulse line blockage, shut-off valve not turned on, etc.
- Signal output error is too big or it exceeds the normal range, need to check the power supply voltage, power consumption and load resistance whether they meet normal operating requirements, the measuring range setting, if adjustment is correct. Also need to check if there is leaks and pressure impulse line blockage, shut-off valve not turned on, rapid temperature fluctuations, etc.

## Depot repair

Please finish the following steps before the depot repair:

- Removal of all the residues which would be harmful to human health, such as inflammable, poisonous, cancerigenic and radioactive substances.
- ⚠ Warning! Do not return the instruments if can not ensure the dangerous residues are removed, eg: the dangerous residues permeate into cracks or spread to the plastic.

## Discard disposal

- The instrument is not restrained of WEEE instruction 2002/96/EG and laws of relevant countries.
- Please pass the instrument to specialized recycling companies other than local recycling points.