LEEG

Electronic Pressure Switch Quick Installation Guide

Safety Precautions

⚠ Electronic pressure switch 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.

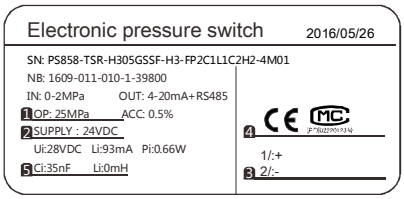
⚠ Electronic pressure switch is powered by an external power supply, the power supply should be in accordance with relevant standards stipulated by energy limitation circuit, and pay attention to the high-voltage that may exist in the circuit.

⚠ The static pressure overload has been marked on the label, the maximum pressure value should be no more than the span of sensor.

⚠ Using Electronic pressure switch in dangerous situations, product installation, using and maintenance should comply with installation guide and relevant provisions of national standards.

⚠ The diaphragm locates at the front of the process connection of pressure switch, contacted or squeezed by hard objects will cause damage.

Label



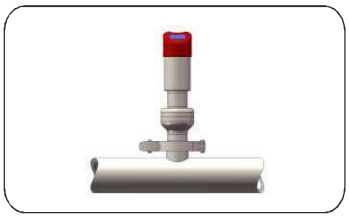
i Important information

1. Static pressure overload
2. Power supply
3. Signal outline type
4. Explosion proof mark
5. Intrinsic safety equipment parameters

⚠ **Please note! Exceeding static pressure overload will cause damage to the instruments, even lead to burt and casualties.**

Product Usage

Pipe pressure measurement



Pressure switch can be installed with adapters on the pipe directly. For high-temperature medium measuring, please order pressure switch with heat exchange connectors.

Container pressure measurement

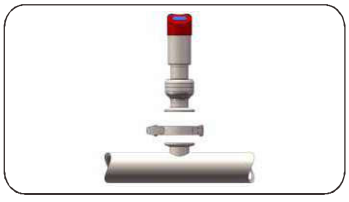
Pressure switch should be mounted on the top of the container to avoid static pressure errors caused by contacting with the medium .

Differential pressure measurement system

With two pressure switches to make up a DP measurement system to measure the pressure value and calculate the differential pressure value.

Install pressure switch

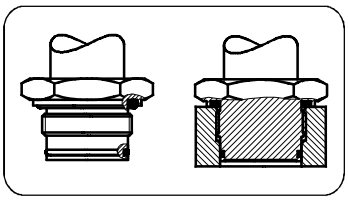
Direct installation



Integrated pressure switch. Install with process connections directly .

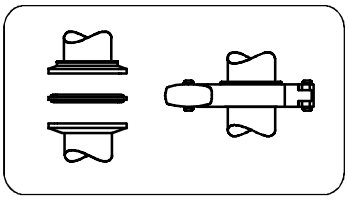
Process connection

Thread connection



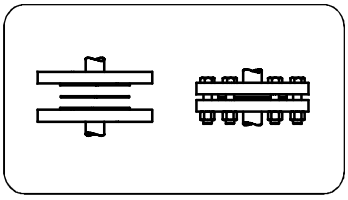
Forbid welding base with pressure switch! Note threaded screw length to avoid glitches scratch the diaphragm.

Tri-clamp connection



Choose gaskets which meet hygienic standards and avoid the measurement errors caused by excessive locking clamp gasket and diaphragm compression.

Flange connection

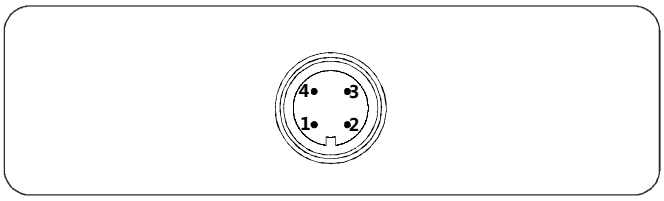


Select gaskets according to medium characters and temperature range.
Pay attention to balance each bolt lock.

The gaskets of Tri-Clamp, filling fluid of diaphragm seals and all the wetted parts should in line with FDA standards.

Electrical connection

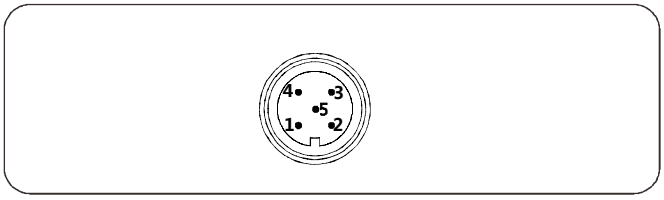
Aviation plug (M12*1, 4 pins)



1	2	3	4
Power+	RS485A+	Power-	RS485B-
Power+	Transistor output 2	Power-	Transistor output 1
Power+	Transistor output 2	Power-	
Power+		Power-	Transistor output 1
Power+	*Signal+	Power-	Transistor output 1

*Signal: 4~20mA, 1-5VDC

Aviation plug (M12*1, 5 pins)



1	2	3	4	5
Power+	RS485A+	Power-	RS485B-	*Signal+
Power+	Transistor output 2	Power-	Transistor output 1	*Signal+

*Signal: 4~20mA, 1-5VDC

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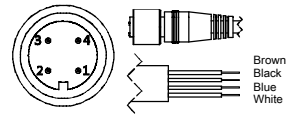
Electrical connection accessories

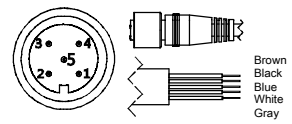
Aviation plug with cable (4 pins)



1/brown	2/white	3/blue	4/black
Power+	RS485A+	Power-	RS485B-
Power+	Transistor output 2	Power-	Transistor output 1
Power+	Transistor output 2	Power-	
Power+		Power-	Transistor output 1
Power+	*Signal+	Power-	Transistor output 1

*Signal: 4~20mA, 1-5VDC

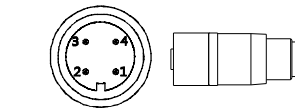
Aviation plug with cable (5 pins)



1/brown	2/white	3/blue	4/black	5/gray
Power+	RS485A+	Power-	RS485B-	*Signal+
Power+	Transistor output 2	Power-	Transistor output 1	*Signal+

*Signal: 4~20mA, 1-5VDC

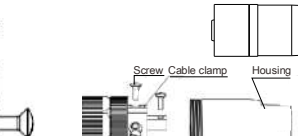
Aviation plug without cable (4 pins)



1	2	3	4
Power+	RS485A+	Power-	RS485B-
Power+	Transistor output 2	Power-	Transistor output 1
Power+	Transistor output 2	Power-	
Power+		Power-	Transistor output 1
Power+	*Signal+	Power-	Transistor output 1

*Signal: 4~20mA, 1-5VDC

Aviation plug without cable (5 pins)

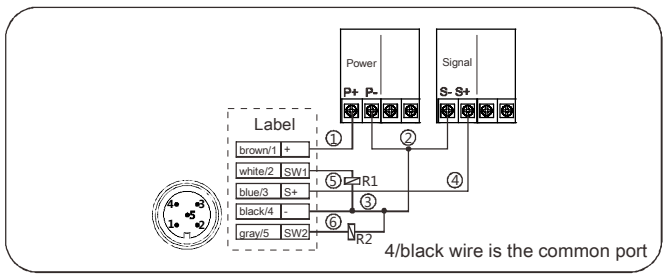


1	2	3	4	5
Power+	RS485A+	Power-	RS485B-	*Signal+
Power+	Transistor output 2	Power-	Transistor output 1	*Signal+

*Signal: 4~20mA, 1-5VDC

Signal connection

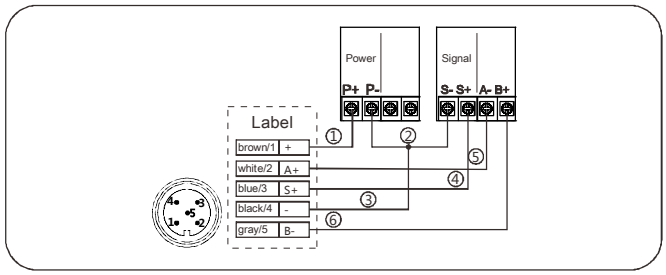
4~20mA five wires + two way transistor output (PNP)



① Connect the positive power supply (P+) to the terminal 1/brown wire of pressure transmitter;
② Connect the negative signal module (S-) to the negative power supply(P-);
③ Connect the negative signal module (S-) to the negative power supply(P-) and then connect to the terminal 4/black wire of pressure transmitter;
④ Connect the positive signal module (S+) to the terminal 3/blue wire of pressure transmitter;
⑤ Connect the first way transistor to the terminal 2/white wire of pressure transmitter;
⑥ Connect the second way transistor to the terminal 5/gray wire of pressure transmitter.

⚠ **The signal connection of 4~20mA + two way NPN output is similar as above. Just note the common port in the fifth and sixth step is positive power supply (1/brown is the common port)**

4~20mA five wires + RS485 output



① Connect the positive power supply (P+) to the terminal 1/brown wire of pressure transmitter;
② Connect the negative signal module (S-) to the negative power supply (P-);
③ Connect the negative signal module (S-) to the negative power supply (P-) and then connect to the terminal 4/black wire of pressure transmitter;
④ Connect the positive signal module (S+) to the terminal 3/blue wire of pressure transmitter;
⑤ Connect RS485 output "A+" to the terminal 2/white wire of pressure transmitter;
⑥ Connect RS485 output "B+" to the terminal 5/gray wire of pressure transmitter.

Power supply

Independent linear direct-current power supply is suggest to be adopted for the power supply of pressure 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 and other record and display equipment, to ensure the voltage provided to the pressure transmitter accord with normal operating requirements.

- Standard current signal output+transistor output: 12-30VDC,
- Modbus-RTU/RS485 output+standard current signal output: 12-30VDC,
- Transistor 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 only effect in the case of good grounding. Metal shell and internal grounding terminals are used to the nearest grounded directly.

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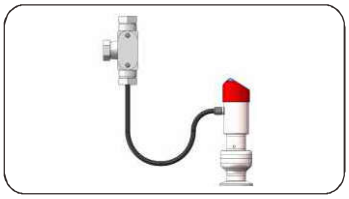
Cable protection system

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

Intrinsic safety type

⚠ The signal connection of intrinsic safety instruments needs to refer to isolated safety barrier factory instructions.

Field adjustment

It is convenient for range adjustment with OLED buttons. For detailed operation, please refer to the instructions of display.

Zero point adjustment

- Please make adjustment after installation because the mounting position will affect zero setting.
- Please ensure the vessel is absolutely empty (No pressure or medium on the measuring diaphragm and the vessel connect to the atmospheric air).
- Power connection please refer to "Keys operation manual-keyboard shortcuts-PV=0" .
- Please set PV=0 after three weeks of installation to ensure the best accuracy.
- Set PV=0 each year.

⚠ **Zero point adjustment is only available for gauge pressure transmitter**

Full span adjustment

- Fill the vessel with medium (fill to the required level)
- The static pressure value should be within the minimum and the maximum pressure range.
- Power connection please refer to "Keys operation manual-keyboard shortcuts-full span adjustment"

Factory resets

- Please refer to "Keys operation manual-keyboard shortcuts-factory resets"

Maintenance

Requires no maintenance

External cleaning

Please notice the following when cleaning:

- Use washing agent which will not damage to the instruments
- Prevent the process diaphragm from mechanical damage, eg: the mechanical damage caused by sharp objects.
- Mechanical cleaning of metal diaphragm(technical and reference) is prohibited.
- Do not point the nozzles to the electrical connection or gage vent(connect to the atmosphere) directly when doing cleaning by pressure washer.

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: -40~85℃
- 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 pressure 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.

⚠ Do not return the instruments back 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.

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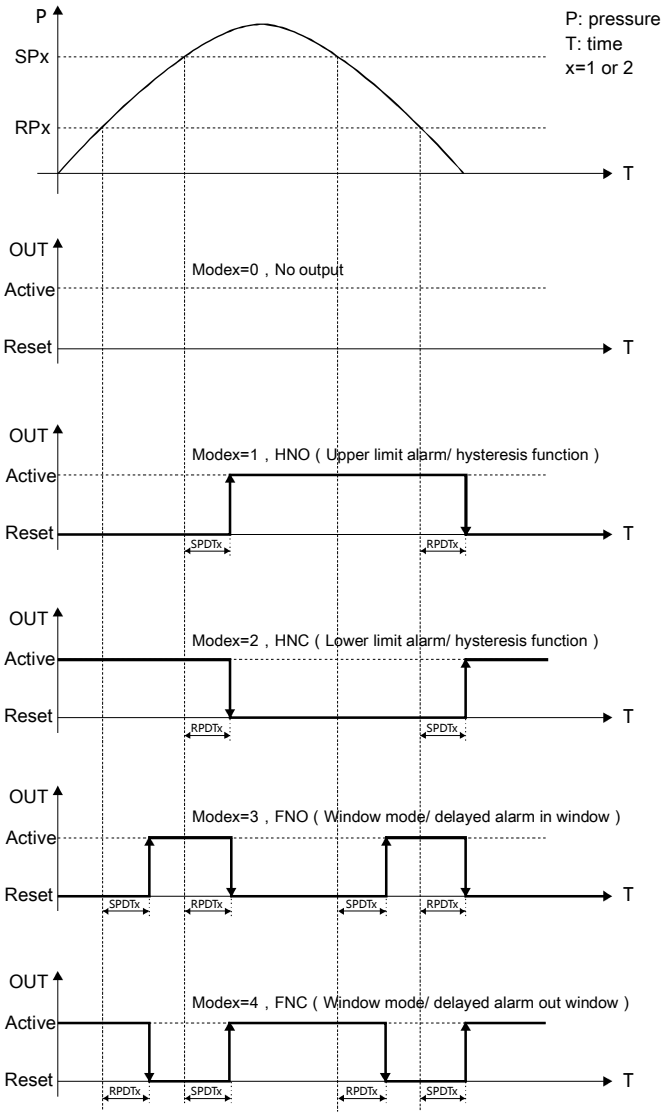
Alarm settings function

Lable	Item	Setting range	Description
SPx (Note1)	OUT upper limit	-99999~99999	Upper limit value of transistor output
Rpx	OUT lower limit	-99999~99999	Lower limit value of transistor output
SPDTx	OUT output delay	0.0~60.0(S)	Delay time before transistor output active
RPDTx	OUT reset delay	0.0~60.0(S)	Delay time before transistor output reset
Modex	OUT working mode	Modex=0	No output. OUTx keeps reset state
		Modex=1	Measured value > SPx, delay SPDTx, OUTx active (Note2)
			Measured value < RPx, delay RPDTx, OUTx reset (0V, the same below)
		Modex=2	Measured value > SPx, delay SPDTx, OUTx reset
			Measured value < RPx, delay RPDTx, OUTx active
		Modex=3	RPx < measured value < SPx, delay SPDTx, OUTx active
			Measured value > SPx or measured value < RPx, delay RPDTx, OUTx reset
		Modex=4	Measured value > SPx or measured value < RPx, delay SPDTx, OUTx active
			RPx < measured value < SPx, delay RPDTx, OUTx reset

Notes: 1. x =1 or 2, SPx ≥ RPx

2. Active electrical level is 2V lower than power supply level. Eg, power supply level is 24V, then active electrical level is 22V.

Oscillogram of alarm function



Application

High level alarm

Output alarm signal when pressure is higher than 1MPa.
Normal setting: SP1=1MPa, RP1=0.95MPa, Mode1=1, SPDT1=1, RPDT1=1.
Pressure rises to 1MPa, delay 1s, OUT1 active (on); pressure drops to 0.95MPa, delay 1s, OUT1 reset (off)

Low level alarm

Output alarm signal when pressure is lower than 1MPa.
Normal setting: RP1=1MPa, SP1=1.05MPa, Mode1=2, SPDT1=1, RPDT1=1.
Pressure drops to 1MPa, delay 1s, OUT1 active (on); pressure rises to 1.05MPa, delay 1s, OUT1 reset (off)

Window function

Starting devices normally requires pressure is within the range 0.5~1MPa.
Normal setting: SP1=1MPa, RP1=0.5MPa, Mode1=3, SPDT1=1, RPDT1=1.
Pressure rises to 1MPa, delay 1s, OUT1 active (on); pressure rises to 1MPa, delay 1s, OUT1 reset (off); Pressure drops to 1MPa, delay 1s, OUT1 active (on); pressure drops to 0.5MPa, delay 1s, OUT1 reset (off)

Automatically keep pressure function

Applying pressure on a device by a compressor and keeping the pressure within the range 0.5~1MPa need two ways output. The first way output controls the compressor and the second way output controls the device. The first way output setting: SP1=0.9MPa, RP=0.6MPa, Model=2, SPDT1=1, RPDT1=1. The first way contact controls the power supply of compressor through intermediate relay to disconnect once the pressure is higher than 0.9MPa and connect once the pressure is lower than 0.6MPa. The pressure value needs to be controlled within 0.6~0.9MPa. The second way output setting: SP2=1MPa, RP2=0.5MPa, Mode2=3, SPDT2=1, RPDT2=1. Once the working pressure of device is not within the range 0.5MPa~1MPa, after 1s, the second way contact controls the alarm output of the device through intermediate relay to ensure the abnormal working pressure of the device can be discovered and handled in time.

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