

Intrinsically safety pressure/differential pressure transmitter manual

This manual applies to the WinSMART™ series intrinsically safe transmitters.

Important matters:



Please read this manual carefully before installing and using.



This manual should be placed in a common place for review.



In order to prevent accidents, only certified technicians or licensed engineers should be responsible for the installation, commissioning and maintenance of this device. Compliance with IEC 60079-14:2013.

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I. Product explosion-proof standards

IEC 60079-0:2011/EN 60079-0:2012 Explosive atmospheres

Part 0: Equipment-General requirements

IEC 60079-11:2011/EN 60079-11:2012 Explosive atmospheres

Part 11: Equipment protection by intrinsic safety “i”

II. The main technical specifications of the product

WinSMART™ pressure/differential pressure transmitter

Main technical specifications:

Measurement range	Table pressure: 0~0.05kpa to 0~40mpa, other pressure ranges available			
Overload Range	1.5 times the full range (typical)-specific parameters can be obtained			
Precision level	0.05% F.S., 0.075% F.S., 0.1% F.S., 0.2% F.S., 0.5% F.S.			
Operating voltage	12~28VDC, 24VDC			
Output signal	4~20mA, HART, Modbus-RTU/RS485, 1~5VDC			
Temperature range	Compensating temperature	Medium temperature	Working temperature	Storage temperature
	-20~70℃, -40~85℃	-25~+80℃	-20~+60℃	-40~+85℃
Temperature effect	0.02% F.S./℃ (typical value)			
Electrical connection	Terminals			
Protection Grade	IP67			
Threaded connectors	M20×1.5 External thread. G1/2 External thread. G1/4 External thread. Others are available.			
Vibration resistance	20g, 20~5000HZ			
Impact resistance	100g,11ms			
Shell material	SUS304 /ADC12			
Service life	>1×10 ⁸ Pressure cycle			
Explosion Proof Sign	ETL20CA103919312X 			
Product Intrinsic safety parameters	Ui=28V, Ii=93mA, Pi=0.65W, Ci=0uF, Li=7.92uH			

III. Environmental conditions requirements

Project		Standard Requirements
Temperature (°C)	Working temperature	-20-60°C
	Storage and transportation temperature	-40~85°C
Humidity (%)	Working humidity	5~85
	Storage and transportation humidity	≤95 (40°C)
Atmospheric pressure (KPa)		86~106
Flameproof safety certification temperature group.		

IV. Application of products, maintenance, and installation instructions

1. Safety precautions

 Flameproof pressure/differential pressure transmitters should be installed, commissioned, and maintained by a professional engineer or technician. Carefully read the product specifications before installation and understand and comply with all requirements.

 Flameproof pressure/differential pressure transmitters are supplied by an external power supply, and the power supply circuit shall conform to the energy limit circuit noted in the technical specifications. Pay attention to the possibility of high voltage in the circuit.

 Flameproof pressure/differential pressure transmitters maximum static pressure and overload have been marked on the product label. Do not exceed the full range of the products.

 Flameproof pressure/differential pressure transmitters are used, installed and maintained in hazardous areas and should comply with this manual, along with national standards and IEC 60079-14:2013.

 Be careful to not disassemble the instrument while under normal operating conditions.

2. Product usage



- Pipe pressure measurement - pressure transmitter

For high-temperature steam measurement, before measuring, it is necessary to add cooling water into the condenser tube, wait for the steam in the pipeline to stabilize, and slowly open the shut-off valve to begin.

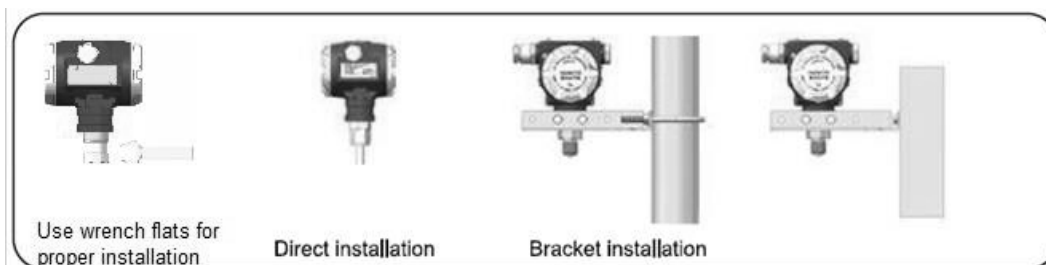


- Open vessel liquid level measurement - single liquid level transmitter.

For the liquid level measurement of the open container, the compatibility of the media should be considered, and the position of the surface liquid surface and temperature should be considered to improve measurement accuracy.

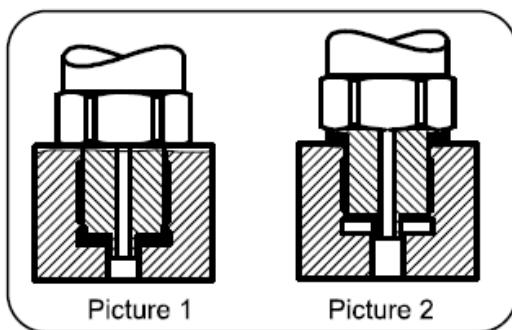
3. Product Installation

- Pressure Transmitter



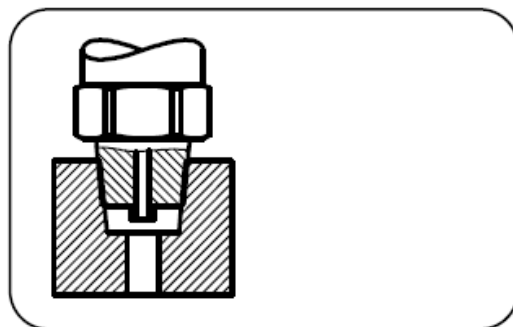
4. Process Connection

- Straight Thread Connection



Picture 1: The length of pressure transmitter thread should be longer than the depth of the thread to ensure the seal of head face gasket is effective.
Picture 2: The length of pressure transmitter thread should be shorter than the depth of the thread to ensure the seal of root gasket is effective.

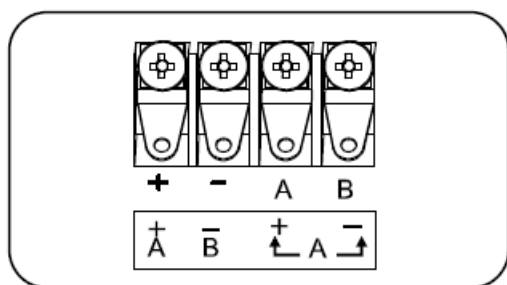
□ Taper Thread Connection



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

5. Electrical connection

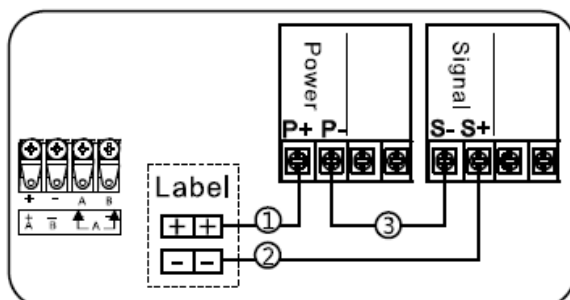
- Module Terminals-Four terminals



Lable	Two wires	Four wires
+	Power+	Power+
-	Power-	Power-
A		Signal+
B		Signal-

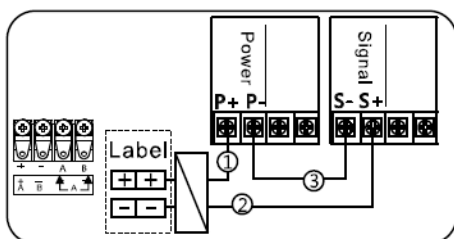
6. Signal Connection

- 4-20mA two-wire (module terminals-four terminals)



- ① Power supply+ is connected with transmitter terminals+
- ② Signal+ is connected with transmitter terminals-
- ③ Signal- is connected with power supply-

- 4-20mA two-wire intrinsic safety (module terminals-four terminals)



- ① Power supply+ is connected with transmitter terminals+
- ② Signal+ is connected with transmitter terminals-
- ③ Signal- is connected with power supply-

⚠ Please note that the wiring should refer to the Installation Information provided by the safety barrier manufacturer.

7. Power supply and grounding

- Power
 - ✧ It is recommended that an independent linear DC power supply be used for the pressure transmitter, the resistance load will cause a pressure drop, the signal cable, the display and other records display the total resistance of the equipment to ensure that the voltage reaching the terminal terminals meet the requirements.
- Grounding
 - ✧ Shielded twisted pair signal cable effect is best, in order to avoid a grounding circuit, as well as a shielding layer using single end grounding, insulating the floating ground, and in the control cabinet side grounding.
 - ✧ Anti-transient built-in module only in good grounding conditions, stainless steel metal casing and internal grounding terminals for direct grounding is suitable.

8. Cable protection system



● Standard Protection system

In order to avoid liquid flow along the cable, resulting in a water ingress into the junction box or transmitter, consider a U-shaped ring installation as shown in the photo.



● Explosion-proof tube protection system

The use of flameproof pressure transmitters should be installed in hazardous areas, and the signal cables shall be connected to the conduit box using a metal flex-tube that leads to a safe area.

9. On-site commissioning



Through the LCD display buttons, junction box external keys (under nameplate) or Hart or Modbus protocols and other software options.

Note: Review "LCD Instruction Manual" for full parametrization instructions

- Zero Point adjustment
 - ✧ After installation, it is strongly recommended that you make an ambient parameterization check as the installation location will affect the zero-setting.
 - ✧ Perform the zero point adjustment when there is no pressure applied onto the diaphragm and the pressure port is exposed to atmosphere.
 - ✧ Set the product power Reference " PV = 0" to operate.
 - ✧ In order to get the highest accuracy, it is recommended that you again make a zero adjustment after approximately 3 weeks of installation.
 - ✧ As well, there is a further recommendation of a zero adjustment once per year.

 Note, the zero point adjustment is only suitable for the pressure and differential pressure transmitter products.

- Full span adjustment
 - ✧ Refill the container (add to the required level).
 - ✧ Please note that the hydrostatic value should be between the minimum and maximum range of the sensor.
 - ✧ Power the product. Refer to the "LCD Instruction Manual" operation.

- Factory resets

Please refer to "LCD Instruction Manual"



Warning !

Any misuse of the product will result in machinery or system damage and possibly personal injury or death.

10. Maintenance, transportation, and handling

- Maintenance
 - Requires no maintenance.

- External Cleaning

When cleaning the instrument, please pay attention to the following points:

- ✧ Use a cleaning agent that does not damage the surface of the instrument and the seal ring.
- ✧ The sensing diaphragm seal must not be touched, including any human or mechanical device. The seal will become damaged.
- ✧ The diaphragm (process and reference) must not be mechanically cleaned.
- ✧ When using a pressure cleaner, do not direct the nozzle directly into the electrical connection or to the air vent (the atmosphere connecting position).
- ✧ When using the pressure cleaning machine for internal cleaning, the nozzle should not be directly pointed towards the diaphragm!

- Transport/Storage

- ✧ Do not store outdoors.
- ✧ Ensure a dry and clean environment.
- ✧ Do not expose to corrosive media.
- ✧ Avoid solar radiation.
- ✧ Avoid mechanical shock and vibration.
- ✧ Storage Temperature -40 to -85 °C.
- ✧ The relative humidity maximum value is 95%.

□ EMC statement

- ✧ Applicable directive: Electromagnetic compatibility Equipment Directive 2014/30/eu.
- ✧ CE mark indicates that the product meets the requirements of the applicable EU standards.

- ✧ The user must ensure that the entire device complies with all applicable standards.

□ Transport

- ✧ The transmitter shall be kept clean and shall not be contaminated with any dangerous media.
- ✧ Please use the original shipping packaging to avoid damage to the equipment!

□ Exception Handling

- ✧ For an abnormal measurement signal, determine whether the process pressure is accurate and normal, consider if there is a measurement system error, any environmental impacts or pressure transmitter abnormalities.
- ✧ When there is no signal output, consider if there are any process pressure changes and whether the output signal changes are corresponding to the pressure changes. If that is not the case, then check the power supply and circuit breaker, input voltage, power consumption and load resistance to ensure proper working requirements, but also check whether there is leakage in the pressure pipe and that the shut-off valve is open.
- ✧ If the output signal error is large or outside the normal range, check whether the power supply voltage, power consumption and load resistance meet the transmitter's normal work requirements. Also verify measurement range settings, the calibration is correct, whether there is leakage or blockage in the process pressure pipe, the shut-off valve is open and if there are any rapid fluctuations of temperature.

□ Repair

The following steps must be completed before the instrument returns to the plant:

- ✧ Drain all remaining fluids. This step is particularly important for fluids that are harmful to human health, such as flammable, toxic, carcinogenic, and radioactive substances.



Taking out of service and dismantling!

- Remove power from the unit
- Disassemble the wiring
- Remove the unit from the process line
- Clean the process connection(s) so there is no media or residue left on the connections
- Place the unit back into its original packaging and return to repair centre / manufacturer

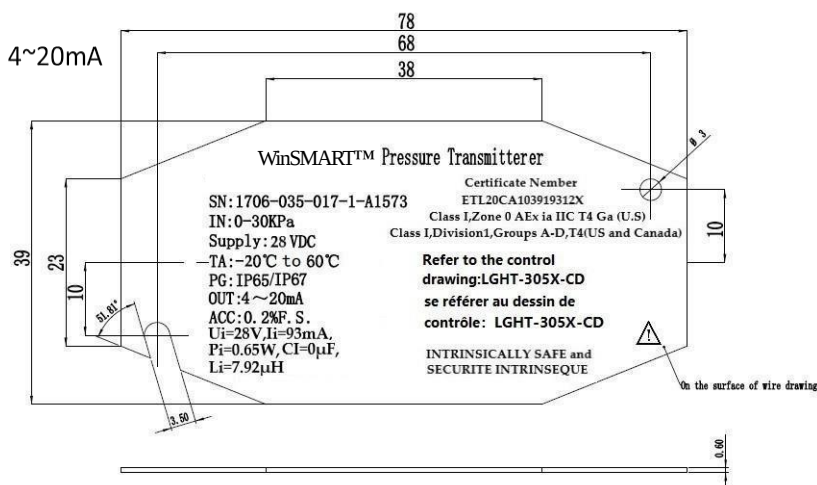


Warning!

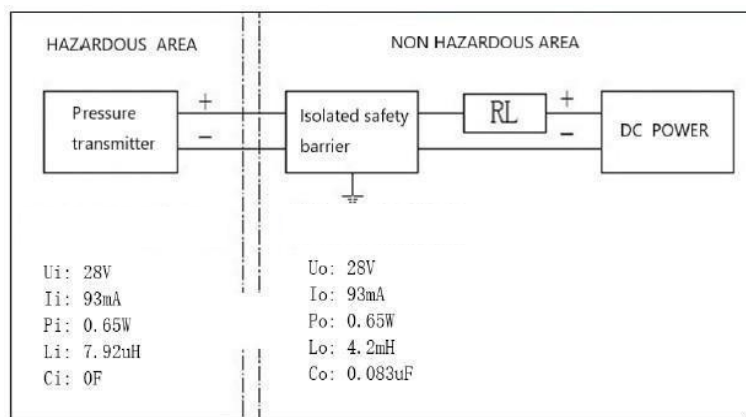
- ✧ Do not work or inspect the instrument unless you are absolutely guaranteed that there are no hazardous substances which have penetrated into the device.
- ✧ DO NOT OPEN IN AN EXPLOSIVE ATMOSPHERE / LOCATION.

- ☐ Equipment utilizes an aluminum housing. The end user shall perform a risk assessment whilst installing this equipment in an EPL Ga environment and it must only be utilized where the risk of impact has been determined to be negligible.
- ☐ The instrument is not subject to the WEEE directive 2002/96/eg and the corresponding state's legal restrictions.
- ☐ This instrument cannot be sent directly to the local recycling point processing. Please give this device to a specialty recycling company.

11. Marking



Control drawing



V. Precautions, WARNING signs

- ✧ The nameplate or the end cover should have a clear warning statement: "Prohibit the opening of the lid."
- ✧ The nameplate has the explosion-proof sign: "  ", also must have the intrinsic safety authentication number: ETL20CA103919312X