

Thermoresistor Isolation Safety Barrier

TR100PI-EX(1 input & 1 output)
 TR200PI-EX (2 input & 2 output)
 TR600PI-EX(1 input & 2output)

— TRx00PI-EX Series

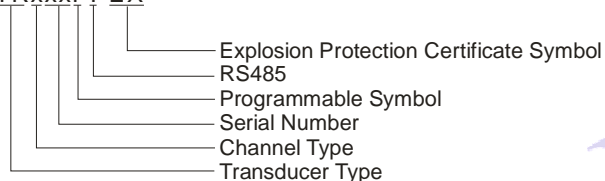


FEATURES

- 3-port isolation (input, output and power supply)
- High accuracy (0.1% F.S.)
(Accuracy decreases with the smaller range)
- High linearity (0.1% F.S.)
- Isolation voltage (Between Hazardous area and safe area: 2500VAC)
- Low temperature drift (50PPM/°C)
- Digital bus (RS485)
- Programmable input/ output
- Alarm indications
- High reliability(MTBF>1,000,000 hours)

PART NUMBER SYSTEM

TRxxxPI-EX



GENERAL DESCRIPTION

The signal generated by the two-wire or three-wire RTDs in the hazardous area is picked up by this product, and converted to the standard analog current or voltage signal which is isolated with hazardous area, and transmitted to the safe area. The product is armed with RS485 digital bus interface, which makes network configuration and the input or output configuration possible in DCS system. It is an intelligent product. One independent power supply is required. Moreover, within the product power supply, input and output are mutually isolated.

Field devices connected and regions:

Two-wire, three-wire RTDs ;

Zone 0, Zone 1, Zone 2, IIA, IIB, IIC, and hazardous area of T4~T6.

SELECTION GUIDE

| TRx00PI-EX | Description | | |
|---------------|-------------|-------------|---------------|
| | Signal Type | Range | Minimum range |
| Input Signal | Pt100 | -200~+850°C | 50°C |
| | Cu50 | -50~+150°C | 50°C |
| | Cu100 | -50~+150°C | 50°C |
| | Pt1000 | -200~+850°C | 50°C |
| Output Signal | Current | 4~20mA | |
| | Current | 0~20mA | |

Note:

1. The initial setting of the product is signal type: PT100, measurement range: -200~+800°C, minimum range: 50°C, current output: 4~20mA.
2. Customers can choose signal type and range, or program with the programming software. (Which can be downloaded at www.mornsun.cn). Modifying is also acceptable if there are special requirements.
3. If you need, you can get the isolator's USB adapter T-02 which is free of charge.

ELECTRICAL SPECIFICATIONS

| | | |
|----------------|-------------------------|--|
| Power Supply | Power Supply | 18~36VDC (Typ: 24VDC) |
| | Input Power | About 2.0W |
| | Power Protection | Reverse protection |
| Hazardous Area | Input Signal | See product overview |
| | Output Signal | See product overview |
| Safe Area | Load | ≤500Ω (@maximum output current) |
| | Communication Interface | RS485 |
| | Communication Protocol | Refer to "MORNSUN Science and Technology Modbus Protocol Rule" |

TRANSMISSION SPECIFICATIONS

| | |
|-------------------------|------------------------------|
| Zero Offset | 0.1%F.S. |
| Gain Error | 0.1%F.S. |
| Accuracy | 0.1%F.S. |
| Temperature coefficient | 0.0050%F.S./°C (-25 ~ +71°C) |

ISOLATION SPECIFICATIONS

| | |
|-----------------------|---|
| Electrical Isolation | Hazardous area and safe area 2500VAC 1min ,leakage current ≤5mA |
| | Output and power supply, 1500VDC 1min ,leakage current ≤5mA |
| Insulation resistance | 100MΩ,500VDC (Signal input port, signal output port) |

STANDARDS & CERTIFICATES

| | |
|---|---|
| Explosion protection Certificate mark | [Exia]IIC |
| Explosion protection certificate parameters | Between the pin 9,10,11 and 13,14,15 U _o =12VDC I _o =50mA P _o =150mW U _m =250VAC/DC Co=1.0μF Lo=7mH |
| Explosion protection certificate agency | NATIONAL QUALITY SUPERVISION AND TEST CENTRE FOR EXPLOSION PROTECTED ELECTRICAL PRODUCTS |
| Explosion qualified NO. | CNEx091827 |

OTHER SPECIFICATIONS

| | |
|---|--|
| Lower limit alarm | Channel 1 lower limit alarm, LED "L" flash with one pulse; Channel 2 lower limit alarm, LED "L" flash with dual pulses; Channel 1 & 2 all lower limit alarm , LED "L" is always on; When one of two channels is upper limit alarm, correspondingly, its output current is about 3mA (4~20mA) or 21mA(0~20mA). |
| Upper limit alarm | Channel 1 upper limit alarm, LED "H" flash with one pulse; Channel 2 upper limit alarm, LED "H" flash with dual pulses; Channel 1 & 2 all upper limit alarm , LED "H" is always on; When one of two channels is upper limit alarm, correspondingly, its output current is about 22mA. |
| Off-line alarm | Channel 1 off-line, LED "O" flash with one pulse; Channel 2 off-line, LED "O" flash with dual pulses; Channel 1 & 2 all off-line, LED "O" is always on; When one of two channels is off-line, correspondingly, its output current is about 23mA. |
| Ambient temperature | Operation temperature: -25 ~ +71°C |
| | Transport and Storage temperature: - 50 ~ +105°C |
| Mounting | 35mm DIN-rail package, hot plug, thickness: 22.5mm, Plastic UL94-V0 |
| Safety Grade | IP20(IEC60529 / EN60529) |
| Weight | Approx 123g |
| Note: 1. Communication protocol details refer to "MORNSUN Science and Technology Modbus Protocol Rule". 2. The MORNSUN Safety Barrier Configuration software can be downloaded free from the MORNSUN homepage www.mornsun.cn or you can contact us to get it. | |

CONNECTION

1. Removable terminal;
2. Cross section area of wiring: 0.5mm²~2.5 mm²
3. The length of bare wire is about 8mm, locked up by the M3 bolt.

Application of Surge Protector

Connect the ground of protection equipment or case and the ground of surge protectors directly, and make the connecting wire as short as possible. Single point grounding can make surge protectors avoid high-voltage between surge protectors and the ground, which makes protection more effectively.

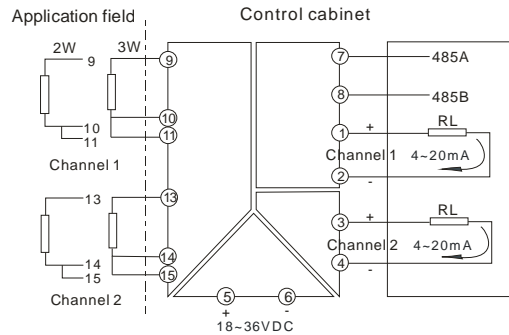
Selection guidelines of intrinsically safety explosion protection system

1. The explosion protection grade of the barrier must be no less than the intrinsically safety explosion protection device in spot.
2. Take in consideration of end resistance and loop resistance and make sure that the barrier output voltage meets the minimum operation voltage requirement of intrinsically safety device in spot.
3. The safety parameters about intrinsically safety end meets:
U_o ≤ U_l, I_o ≤ I_{in}, P_o ≤ P_{in}
C_o ≥ C_{in}, L_o ≥ L_{in}
1. Select suitable safety barrier which matches the intrinsically safety device in spot according to the power polarity, signal type and transmission mode of the device.
2. Much more protection is required, in order to avoid the influence of the leakage current generated by safety barrier on intrinsically safety device in spot.

Operation notes

1. Please read the user manual carefully before using. If any questions please contact our technical support department.
 2. Please do not use this product in hazardous area.
 3. Power supply of this product should be 24VDC. 220VAC is prohibited.
- To avoid explosion protection function invalid or any failure, disassembling the product is forbidden.

APPLICATION CIRCUIT DIAGRAM & PIN DESCRIPTION



Note:

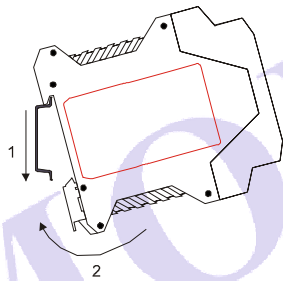
1. This diagram is for 2 channels input & 2 channels output model only. Channel 2 of input end is no connection for 1 channel input & 2 channels output model, and channel 2 of input and output end is no connection for 1 channel input & 1 channel output model.
2. For three-wire RTDs signal input, make sure the equal resistance of three wires as possible as you can;
3. For two-wire RTDs signal input, terminal 10 and 11, 14 and 15 must be short connected.

INSTALLATION & DISASSEMBLY

Installation

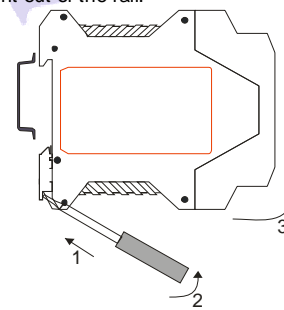
DIN35mm standard rail installation:

1. Insert the top of the instrument card in the rail;
2. Push the bottom of the instrument into the rail.

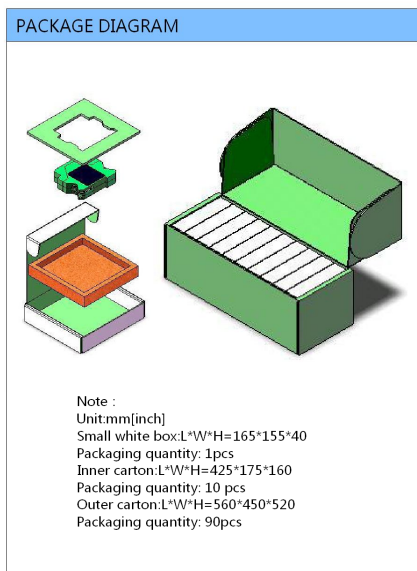
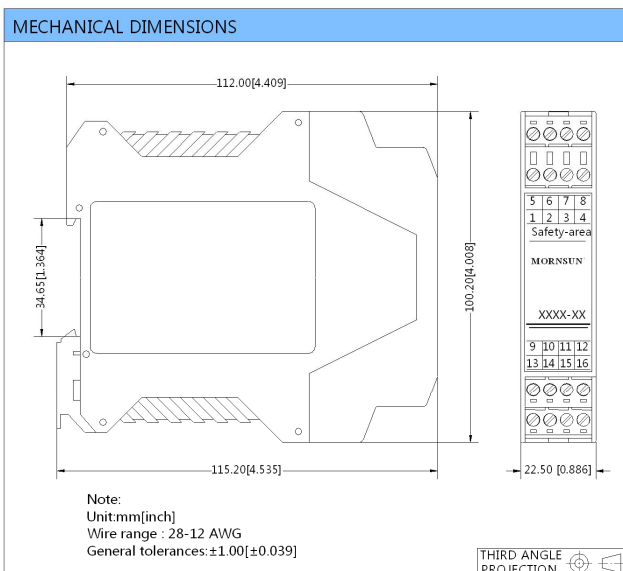


Disassembly

1. Use a screwdriver (Width of edge $\leq 6\text{mm}$), cut in the metal card lock from the underside;
2. Boost up the screwdriver and pry the metal card lock downwards;
3. Pull the instrument out of the rail.



PACKAGING DIMENSION & PACKAGING DIAGRAM



Note:

1. All specifications are measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. In this datasheet, all the test setup and methods are based on our corporate standards.
3. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more details.
4. Please contact our technical support for any specific requirement.
5. Specifications of this product are subject to changes without prior notice.

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