C Series Single Channel
TC & RTD Isolated Safety Barrier

Nanjing New Power Electric Technology Co., Ltd.

➔ Introductions

This isolated safety barrier converts the thermocouple/ thermal resistance signals from a hazardous area into current or voltage signals to a safe area by isolation. DIN rail power supply function can be selected in ordering.

The input, output, and power supply are galvanically isolated from each other. Calibrate the apparatus or modify parameters by using a handheld programmer.

➔ Parameters

Explosive-proof grade: [Ex ia Ga] IIC

Power supply:

Connection type: Terminals (14+, 15-) or DIN rail connector

Rated voltage: 18V DC ~ 60V DC (Recommended: 24V DC)

Input (1, 2, 3): TC, 2/3-wire RTD

The input signal needs to be determined when ordering and can also be programmed.

Line resistance: ≤ 20 Ω per line

Output (7, 8, 9; 10, 11, 12):

Sink mode: 4 ~ 20 mA; 20 ~ 4 mA

Output current: 0(4) ~ 20 mA; 0 ~ 10 mA; 20 ~ 4 mA

Output voltage: 0(1) ~ 5 V; 0 ~ 10 V

Note: 4~20mA Outputs can be configured NAMUR NE 43.

Output ripple: ≤ 5 mV_{rms} (Load resistance: 250 Ω)

Load resistance:

Sink mode: R_L ≤ [(U-3)/0.02] Ω; U: Loop power supply

0(4) ~ 20 mA, 20 ~ 4 mA: ≤ 550 Ω; 0 ~ 10 mA: ≤ 1.1 kΩ

0(1) ~ 5 V: ≥ 1 MΩ; 0 ~ 10 V: ≥ 2 MΩ

Other load resistance is required special customization, please see the productlabel for details.

Transmission characteristics (25℃±2℃):

Standard	Input	Range/Accuracy
TC		
IEC 60584-1	K	<300℃, ±0.3℃; ≥300℃, ±0.1%F.S.
	E	<300℃, ±0.3℃; ≥300℃, ±0.1%F.S.
	J	<300℃, ±0.3℃; ≥300℃, ±0.1%F.S.
	T	<300℃, ±0.3℃; ≥300℃, ±0.1%F.S.
	N	<300℃, ±0.3℃; ≥300℃, ±0.1%F.S.
	S	<500℃, ±0.5℃; ≥500℃, ±0.1%F.S.
	R	<500℃, ±0.5℃; ≥500℃, ±0.1%F.S.
	B	<500℃, ±0.5℃; ≥500℃, ±0.1%F.S.
	W5Re-W26Re	<500℃, ±0.5℃; ≥500℃, ±0.1%F.S.
ASTM E988-96	W3Re-W25Re	<500℃, ±0.5℃; ≥500℃, ±0.1%F.S.
GOST R8.585	L	<300℃, ±0.3℃; ≥300℃, ±0.1%F.S.
RTD		
IEC 60751	Pt100 (α=0.00385)	<100℃, ±0.1℃; ≥100℃, ±0.1%F.S.
GOST 6651	Pt100 (α=0.00391)	<100℃, ±0.1℃; ≥100℃, ±0.1%F.S.
	Cu50 (α=0.00428)	<100℃, ±0.1℃; ≥100℃, ±0.1%F.S.
	Cu100 (α=0.00428)	<100℃, ±0.1℃; ≥100℃, ±0.1%F.S.
	Cu50 (α=0.00426)	<100℃, ±0.1℃; ≥100℃, ±0.1%F.S.
	Cu100 (α=0.00426)	<100℃, ±0.1℃; ≥100℃, ±0.1%F.S.

Response time: ≤ 0.5 s

Temperature drift: 30 ppm/℃

Cold junction compensation accuracy: ± 1 ℃

Cold junction compensation range: -20 ℃ ~ +60 ℃

Electromagnetic compatibility: According to IEC 61326-3-1

Dielectric strength (1 mA leakage current, 1 minute test time):

≥ 3000V AC (Intrinsically safe side / Non-intrinsically safe side)

≥ 1500V AC (Power supply / Non-intrinsically safe side)

Insulation resistance: ≥ 100 MΩ (Input /Output/Power supply)

Parameters certified by China National Quality Inspection and detection Center for Explosion Protected Electrical Products (CQST):

U_m: 250 V

Terminals 1, 2, 3:

U_o: 8.7 V; I_o: 33 mA; P_o: 72 mW; C_o: 3.58 μF; L_o: 21mH

Ambient conditions:

Operation temperature: −20 ℃ ~ +60 ℃

Relative humidity: 10 %RH ~ 90 %RH (40 ℃)

Atmosphere pressure: 80 kPa ~ 106 kPa

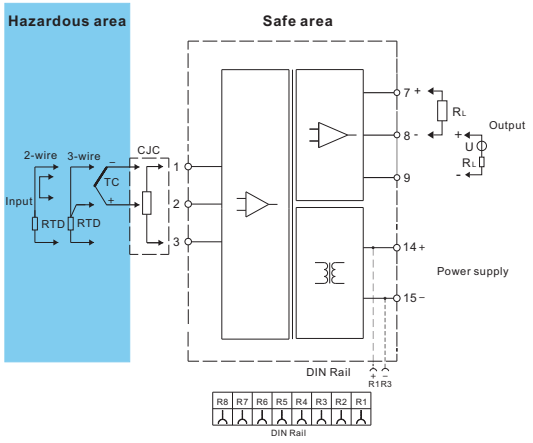
Storage temperature: −40 ℃ ~ +80 ℃

Power dissipation:

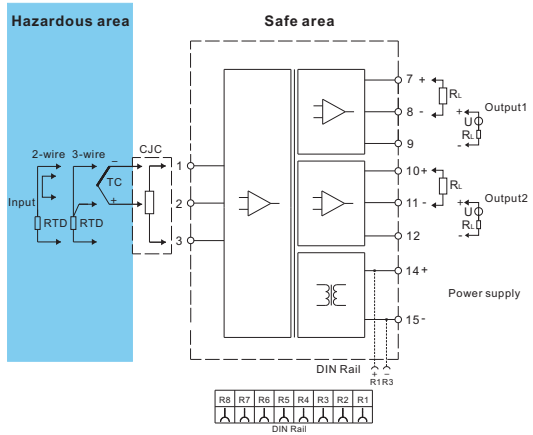
0.8 W (24 V DC, single output)

1.2 W (24 V DC, double output)

➔ Wiring diagram



NPEXA-C01H etc.

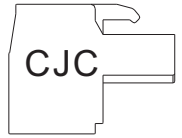


NPEXA-C011H etc.

❍ When the thermocouple input, compensation conductor should be directly connected to the CJC terminals, do not connect other material lead, otherwise will cause measurement error.

NOTE!

When the thermocouple input, please use CJC terminals; When the thermal resistance input, please use general terminals. Mix the two forms can lead to temperature measurement error, etc. Make sure the screws of terminal 3 is fixed firmly. The figure of CJC as follows:



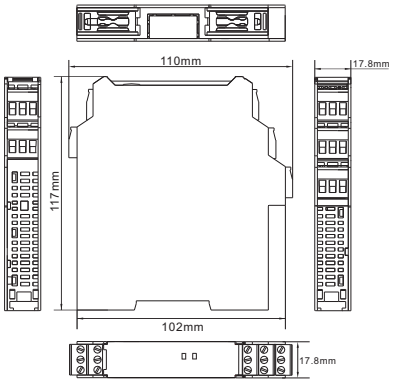
❍ The following table shows the values of the current output during a overrange alarm mode, take RTD input and 4~20mA output as an example. Default following mode.

Alarm mode	Breakage	Downscale	Upscale	Short-circuit
Following mode	0mA	0~4mA	20~22mA	0mA
4~20mA NE43	2mA	3.8~4mA	20~20.5mA	21.5mA
Alarm value output mode (e.g. 3.5mA)	3.5 mA (Fixed value)			

❍ DIN rail power supply function is selectable at ordering.

➔ Dimension

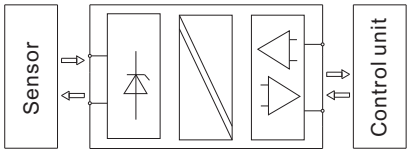
Width × Height × Depth: 17.8 mm × 110 mm × 117 mm



➔ Applications

This apparatus is used for transmitting signals between field devices and process control system. It can be used to connect field equipment which is installed in potentially explosive gas environment, and protect the intrinsically safe equipment in a hazardous area by limiting current and limiting voltage.

The apparatus can convert the thermocouple/thermal resistance signals into current or voltage signals, and then transmit the output signal to the connected process control system.

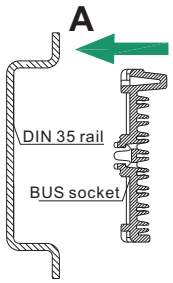


➔ BUS Specification

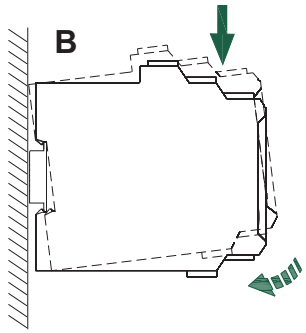
BUS	Electrical Characteristics
Current	Max. 8 A
Voltage (UL/IEC)	1.6 kV
Operation temperature	−40 ℃ ~ +105 ℃

➔ Installation

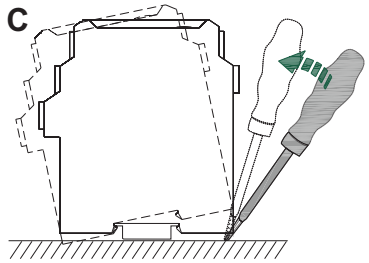
- The apparatus can be installed on the DIN 35 mm standard rail which is corresponding to DIN IEC 60715. The must be snapped onto the rail, and never slanted or tipped to the side.
- Installation and disassembly steps are shown in following figures:



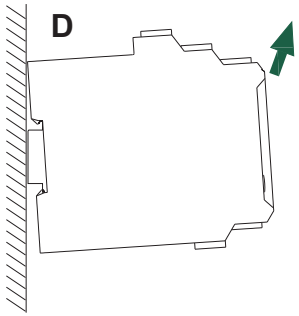
A. Snap the BUS socket on the DIN 35 rail, as figure A;



B. Snap lock onto mounting rail, then rotate the device, as figure B, press down the device onto mounting rail, make sure that the BUS connector pins of device and BUS socket are in close contact.

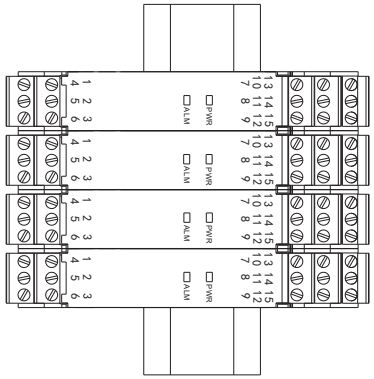


C. Pry the lock off the rail with screwdriver as arrow shown, pull downward the lock, and rotate the device.

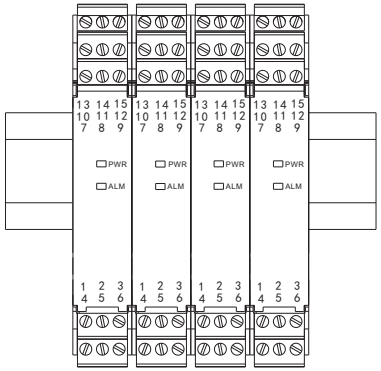


D. Remove the device as arrow shows.

- Low heat dissipation allows vertical or horizontal mounting without spacing. Normal operation is guaranteed over the full temperature range of the system in any mounting direction and without restriction.



Vertically installation



Horizontally installation

➔ Light indication

- **PWR**: Power indicator light shows green, it means work normally.
- **ALM**: Input signal state indicator (red), it is off during normal operation, remain bright when input over-range; **RTD**: It is glitter when input line breakage or short circuit (except for linear resistance short circuit); **TC**: It is glitter when input line breakage.

➔ Attention

- Isolated Safety Barriers degree of protection is IP20 and must be protected from undesirable ambient conditions (waterproofing, small foreign objects). It is suitable for installation in the control room or high density field cabinet, DIN 35 mm installation is convenient for installation and displacement.
- The devices were designed for use in pollution degree 2 and overvoltage category III as per IEC/EN 60664-1. If used in areas with higher pollution degree, the devices need to be protected accordingly.
- Installation position shall not be affected by strong mechanical vibration; impact and electromagnetic induction from signal terminal and power supply, should conformity with the requirements on electromagnetic interference resistance of products in Class 3 industrial field atmosphere stipulated in IEC 61000-4; the atmosphere shall be free from gases that are corrosive to metal and plastic components.
- The apparatus may only be operated, maintained and decommissioned by competent according with the instruction manual, and it must be installed, connected and adjusted in non-hazardous area.
- The operator must strictly comply with the relevant local safety standards and guidelines.

➔ Supplementary instructions

- Our company reserves the right to change the product information without prior notification to the user. If the contents of the description are different from website or sample, this description shall prevail.