

Programmable thermocouple isolators



## FEATURES

- Isolation test voltage of 2000VAC for signal input to output and to power ports
- Ultra-slim 12.5mm case
- High accuracy (0.1% Full Scale)
- High linearity (0.1% Full Scale)
- Extremely low temperature coefficient (50PPM/°C)
- Excellent EMC performance
- Mini USB port communication
- Programmable input / output range
- Proven reliability with MTBF >500,000 hours

TCxxxPW series of programmable thermocouple isolators are mainly used in systems for industrial automation. They provide an isolated conversion of thermocouple input signals from common industrial instruments into matching analog output signals for DCS/PLC, by realizing acquisition and transmission of field signals. An independent DC power source is required to supply the module that isolates the power ports from the signal input and output ports. This series of products contains a combination of 1 input with 1 output, 1 input with 2 outputs or 2 inputs with 2 outputs. The extremely compact design having a thickness of only 12.5mm, meets the demand for high density installations.

## Selection Guide

Output Type	1 input 1 output	2 input 2 output	1 input 2 output
Current Output	TC100PW	TC200PW	TC600PW
Voltage Output	TC140PW	TC240PW	TC640PW
Input Signal	Signal type	Measuring range	Min. measuring range
	R	-40°C to +1700°C	600°C
	S	-40°C to +1700°C	600°C
	K	-150°C to +1370°C	120°C
	J	-80°C to +900°C	100°C
	T	-160°C to +390°C	100°C
	B	+320 °C to +1820°C	780°C
	E	-80°C to +700°C	500°C
Output Signal	Current	4-20mA / 0-20mA (programmable)	
	Voltage	0-5V / 0-10V / 1-5V / 2-10V (programmable)	

- Notes:
1. The customer must define type of input signal, measuring range and form of output signal when placing the order; customizations are available on request;
  2. The auxiliary USB adapter model is T-01; please contact our technical staff for specific information.

## Input Specifications

Item	Operating Conditions	Value
Power Input	Input Power	18-30VDC (Typical value 24VDC)
	Power Dissipation (Isolators)	1 input 1 output ≤1.2W; 1 input 2 output and 2 input 2 output ≤1.8W
	Power Supply Protection (Isolators with isolated power output)	Reverse polarity protection, over-voltage protection
Hazardous Area	Input Signal	See List of Product Models
	Cold junction Compensation	Compensation range: -25°C to +75°C 1°C error for every 20°C Method of compensation: Internal compensation

### Output Specifications

Item	Operating Conditions	Value						
Safe Port	Fault Output							
	Output Type		4-20mA	0-20mA	1-5V	0-5V	0-10V	2-10V
	Input disconnection		2.5mA	23mA	0.625V	5.75V	11.5V	1.25V
	Load Capacity	Output current maximum	≤ 500Ω					
		Output voltage maximum	≥ 1MΩ					
	Communication interface		Mini USB port					
Communication Protocol		See "MORNSUN Modbus Protocol Rules"						

### Transmission Specifications

Item	Operating Conditions	Value					
Signal Precision	Ta=25℃, full-scale range, 100% load	0.1% Full Scale					
Zero Offset	Ta=25℃, Sin = 0, 100% load	0.1% Full Scale					
Temperature Coefficient	Operating temperature range of -25℃ ~ +71℃	50PPM/℃					
Lower Limit Alarm, approx.		About 3mA	About 21mA	About 0.75V	About 5.25V	About 10.5V	About 1.5V
Upper Limit Alarm, approx.		About 22mA	About 22mA	About 5.5V	About 5.5V	About 11V	About 11V
Normal Operation		Corresponding channel's Red LED warning light is off					
Limit Alarm	Exceeding upper or lower limit	Corresponding channel's red LED blinks					
Disconnection Alarm		Corresponding channel's red LED on					
Response Time		< 0.5s					

### General Specifications

Item	Operating Conditions	Value					
Electric Isolation	Electric strength test for 1 minute with a leakage current of ≤5mA	Site zone and control zone 2kVAC/3kVAC					
		Output and power supply 2kVAC/3kVAC					
Isolation Resistance	Signal input port, signal output port	100MΩ, 500VDC					
Operating Temperature		-25℃ to +71℃					
Transportation and Storage Temperature		-40℃ to +85℃					

### Mechanical Specifications

Case Material	Flame retardant material UL94 V-0
Safety Class	IP20 (IEC60529 / EN60529)
Package Dimensions	35mm DIN rail package, direct plug-in type terminal, 22.5 mm wide
Weight	100g / 135g (1 input 1 output / 2 input 2 output & 1 input 2 output)

### Electromagnetic Compatibility (EMC)

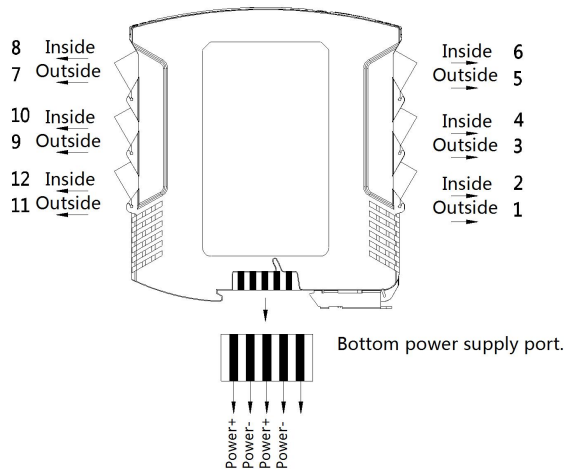
Emissions	CE	CISPR32/EN55032	CLASS A	
	RE	CISPR32/EN55032	CLASS A	
Immunity	ESD	IEC/EN61000-4-2	Contact ±4kV/Air ±8kV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	power supply port ±2kV	perf. Criteria A
		IEC/EN61000-4-4	signal port ±1kV	perf. Criteria A
	Surge	IEC/EN61000-4-5	power supply port ±1kV/2kV	perf. Criteria B
		IEC/EN61000-4-5	signal port ±1kV (line-to-ground)	perf. Criteria B
CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A	

Application Precautions

1. Carefully read and follow the instructions before use; contact our technical support if you have any question;
2. Do not use the product in hazardous areas;
3. Use only DC power supply source for this product and 220V AC power supply is prohibited;
4. It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction.

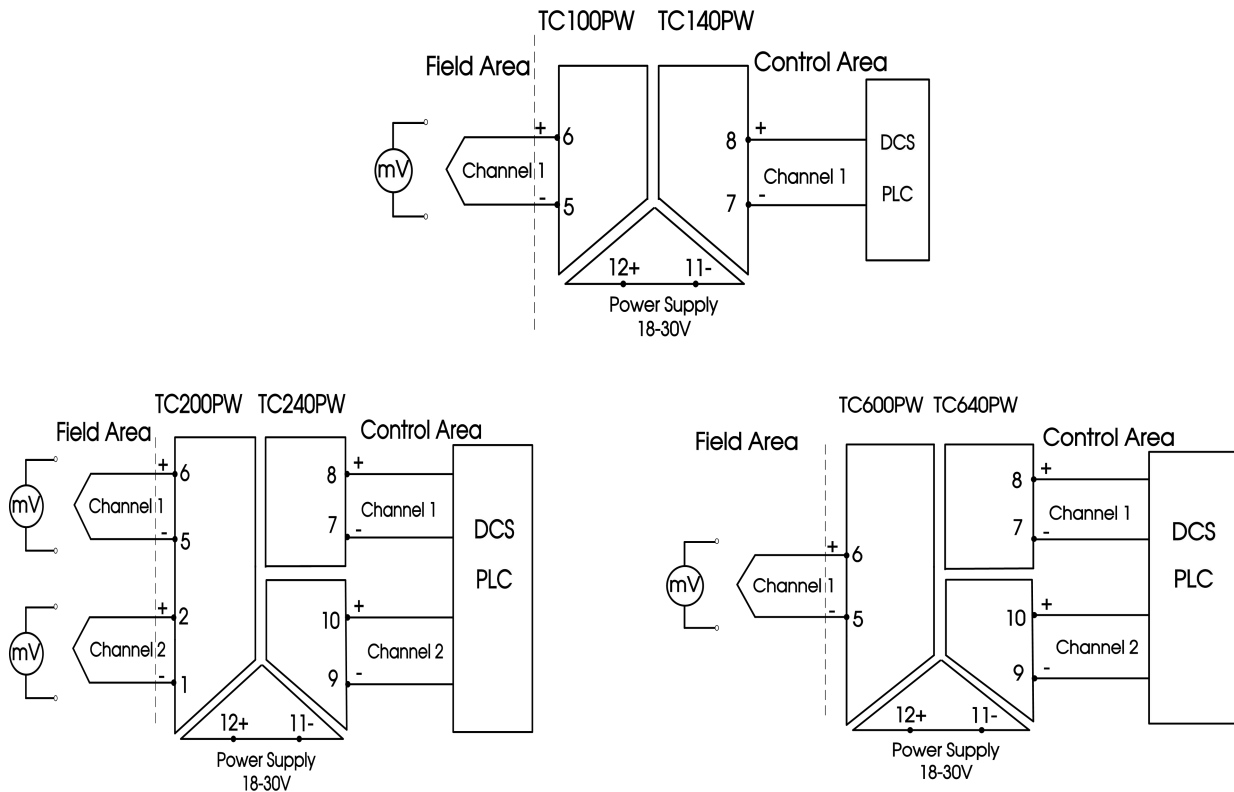
Design Reference

1. Wiring diagram for product application



PIN	Description (2 input 2 output)
1	Signal 2 input-
2	Signal 2 input+
5	Signal 1 input-
6	Signal 1 input+
7	Signal 1 output-
8	Signal 1 output+
9	Signal 2 output-
10	Signal 2 output+
11	power input-
12	power input+

Note: When use bottom power supply, anyone group or both is OK.



- ① Use dismountable terminals for instrument wiring, easy to operate;
- ② The sectional area of - conductor is 0.5mm<sup>2</sup>- 2.5mm<sup>2</sup>;
- ③ The length of conductor exposed is 8mm and is fastened by M3 bolts.

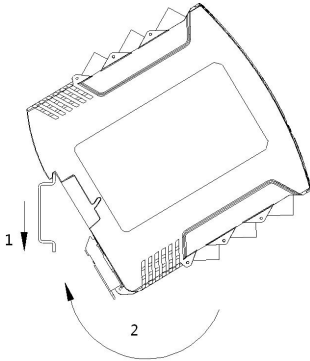
2. For additional information please refer to application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Installation & Removal

Installation

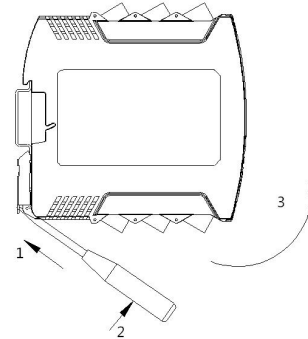
Standard 35mm DIN rail installation:

1. Insert top of Module into DIN rail;
2. Push bottom of Module into rail until it snaps in.

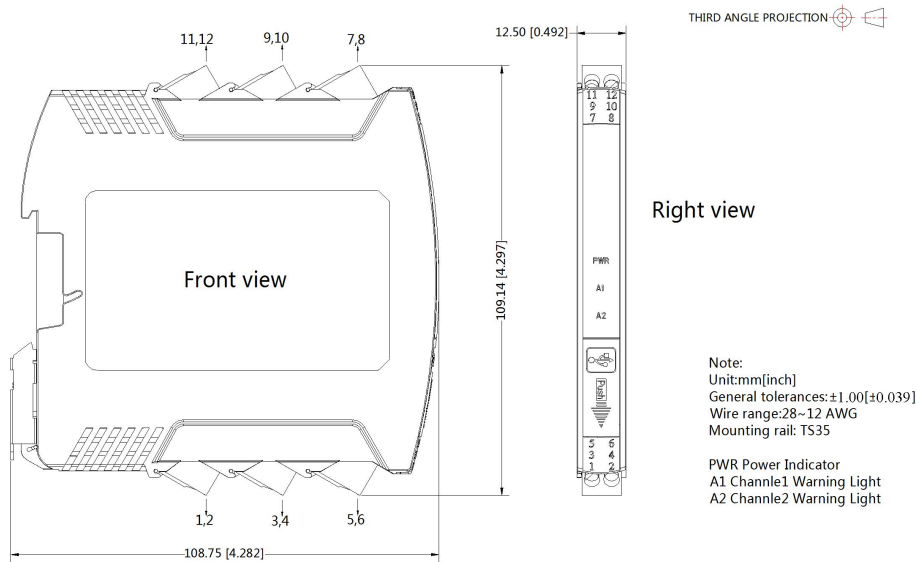


Removal

1. Insert screw driver on the lower end of Module to release clamp (tool edge width  $\leq 6\text{mm}$ );
2. Push screw driver up towards Module to slide clamp out;
3. Pull Module up out of the guide rail.



Dimensions



Notes:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). The Packaging bag number: 58040010;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^\circ\text{C}$ , humidity $<75\%\text{RH}$  with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on company corporate standards;
4. The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements. For details, please contact our technical staff;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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