Datasheet

Temperature Isolator

AI-I3S

Arka Instruments LLP

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Temperature isolator can convert signals such as RTD or thermocouple into standard current or voltage signals to other instruments, realizing three-terminal isolation between input, output and power supply, thus improving the anti-interference ability of industrial process automatic control system and ensuring the stability and reliability of the system. Isolator can be used with all kinds of instruments, DCS, PLC and other equipment.

Applications

- Petroleum
- Petrochemical
- Manufacturing
- Power
- Metallurgy

Temperature Isolator

Features

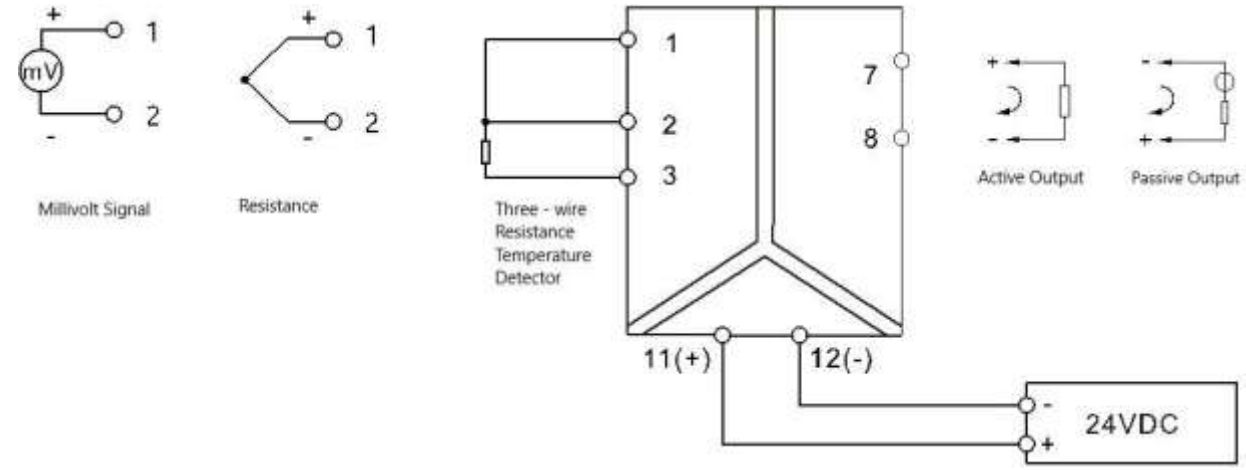
- Low power consumption with efficient heat dissipation design.
- Distributive output with current-limiting protection for increased reliability and safety.
- Supports a maximum load of 550Ω for current output.
- Ultra-thin design with a 13mm slim casing, saving installation space.
- Flame-retardant casing for enhanced safety.

Principle

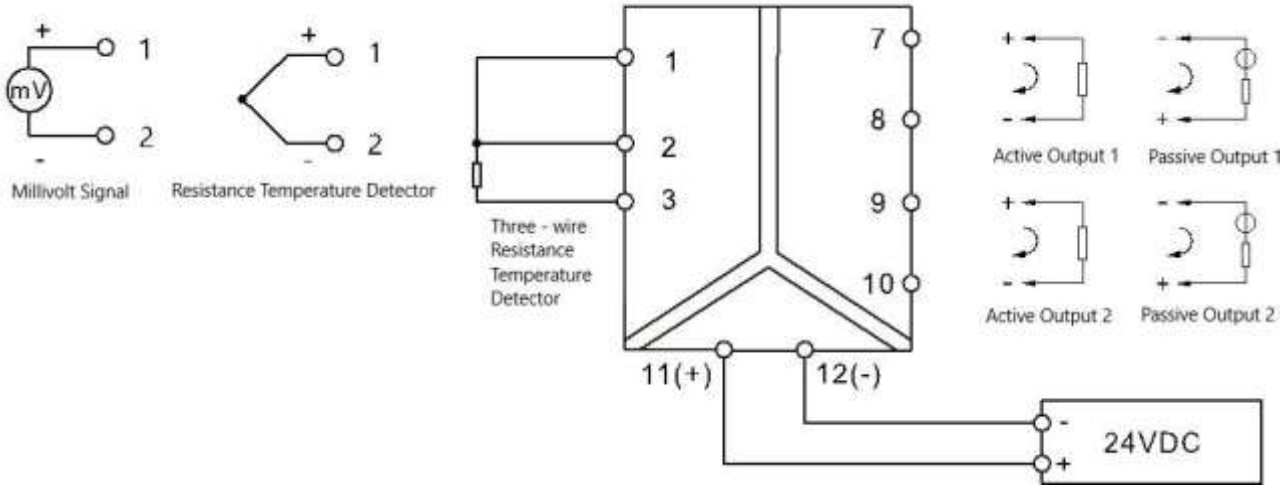
The working principle of a temperature isolator mainly relies on advanced sensing and isolation technologies. It is designed to handle temperature - related signals precisely. Firstly, it uses highly sensitive temperature sensors, such as thermocouples or resistance temperature detectors (RTDs), to detect the ambient or target temperature. These sensors convert the temperature variation into corresponding electrical signals. Then, through an isolation component, which could be based on electromagnetic induction or optical coupling technology, the input electrical signal related to the temperature is isolated from the output side. This isolation ensures that there is no direct electrical connection between the input and output, preventing interference and potential damage to the connected systems. In this way, the temperature isolator can accurately measure and transmit the temperature signal while safeguarding the integrity of the overall circuitry.

Parameters	
Resistance Temperature Detector (RTD)	- Conventional: Pt100, Cu50, Cu100 - Customizable: Pt50, Pt200, Pt500, Pt1000
Thermocouple	K, E, S, B, J, T, R, N, WRe3 - WRe25, WRe5 - WRe26
Potentiometer (Requires Customization)	(0 - 500)Ω, (0 - 1.5)kΩ, (0 - 3)kΩ, (0 - 5)kΩ, (0 - 10)kΩ, (0 - 20)kΩ
mV Signal	(- 120 - 120)mV
Note	The input signal type and range are determined at the time of ordering and can also be modified through host computer software.
Output Signal	(0 - 20)mA, (4 - 20)mA, (0 - 5)V, (1 - 5)V, (0 - 10)V, (2 - 10)V
Output Load	- For (4 - 20)mA, (0 - 20)mA: Load resistance RL ≤ 550Ω - For (0 - 5)V, (1 - 5)V, (0 - 10)V, (2 - 10)V: Load resistance RL ≥ 1MΩ
Insulation Strength (Between Input/Output/Power Supply)	1500Vrms (1 min, no spark)
Response Time	≤500ms (single channel)
Temperature Drift	≤40ppm
Electromagnetic Compatibility	Complies with GB/T18268 (IEC 61326 - 1) requirements for industrial equipment applications
Power Supply	(20 - 35)VDC
Power Consumption	- Single - channel output power consumption: ≤1W - Dual - channel output power consumption: ≤1.4W
Working Temperature	(- 20 - 60)℃
Relative Humidity	25% - 85%
Storage Temperature	(- 20 - 60)℃
Installation Method	35mm DIN rail installation

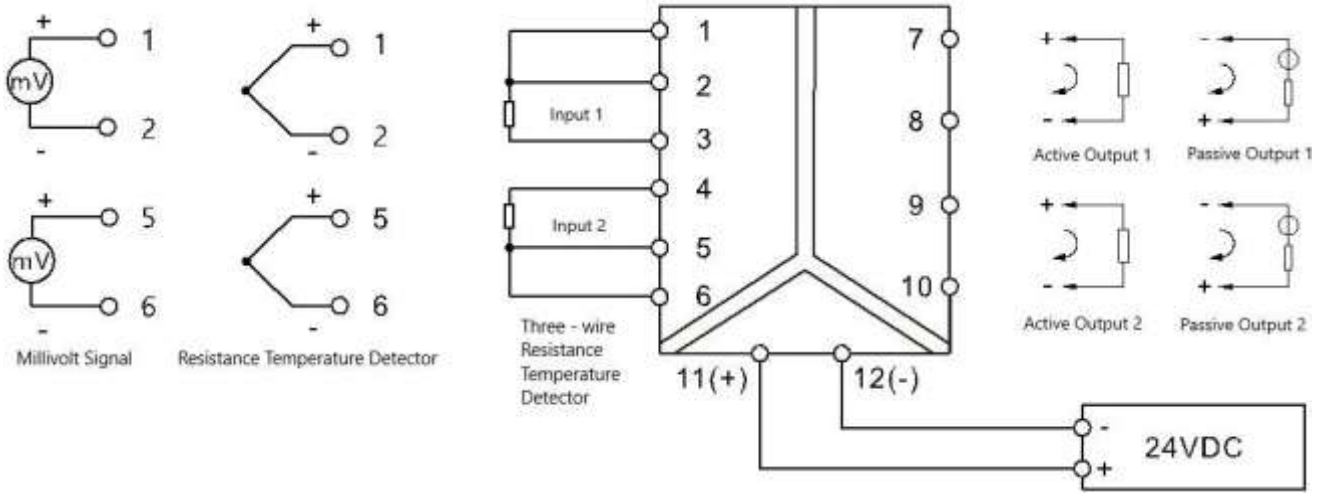
Wiring



Single Input - Single Output Wiring Diagram



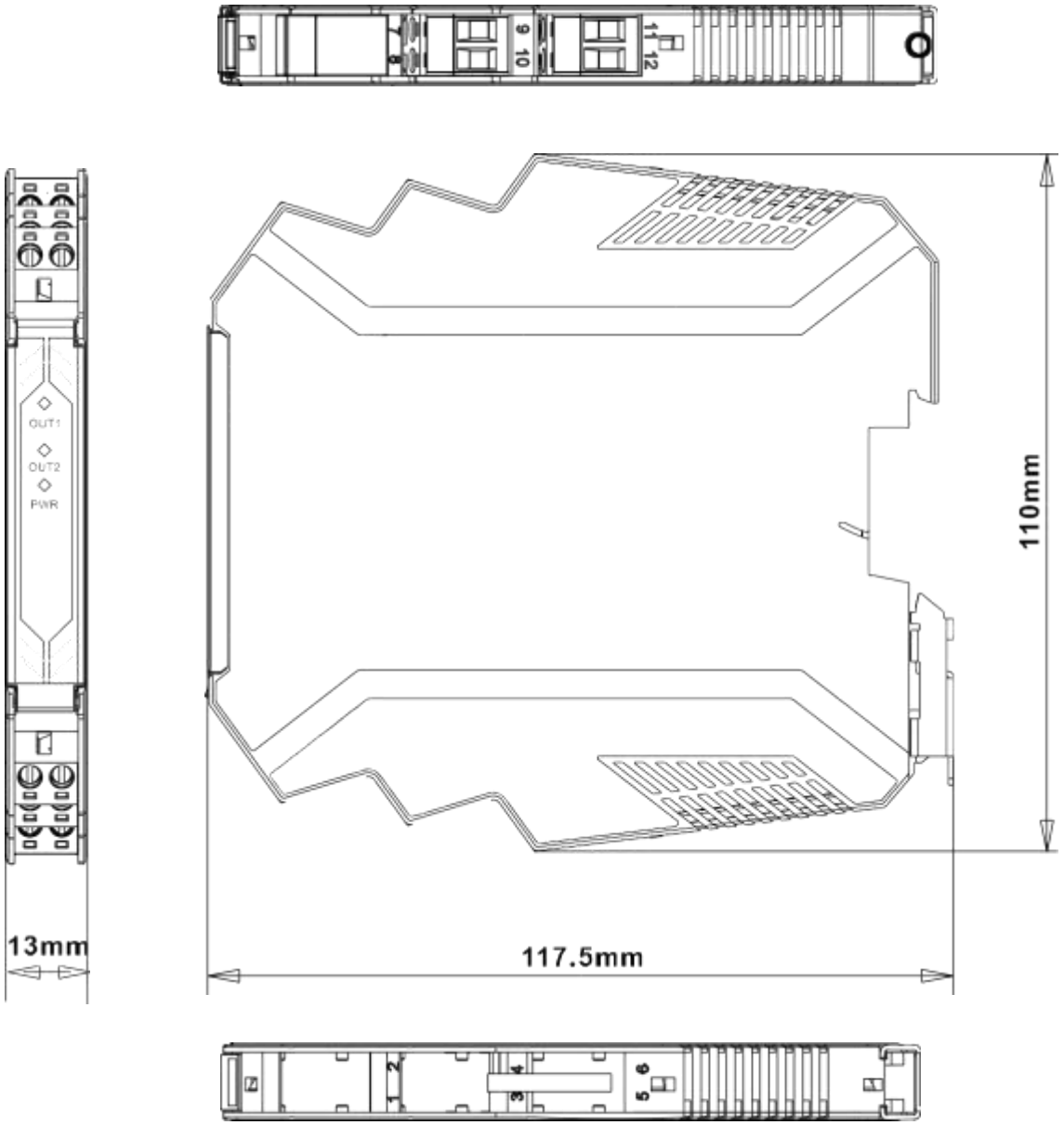
Single Input-Dual Output Wiring Diagram



Dual Input - Dual Output Wiring Diagrams

Dimensions

Overall dimensions 117.5mm*110mm*13mm, weight about 130g



Installation

The isolator is for indoor use only. Please install it in a safe location and meet the environmental conditions required by the isolator's technical specifications.

The isolator can be mounted on a standard 35mm DIN rail, complying with the TH35-7.5 type rail size specifications in national standard GB/T19334-2003.

When installing or disassembling instruments, please turn off the power and disconnect the signal input to ensure safety. Do not apply loads exceeding the design capacity to the instrument.

Mounting Method on the DIN rail (see Fig.1):

(1) Hook the upper end of the instrument's mounting bracket onto the standard DIN rail.

(2) Push the instrument towards the DIN rail to fully fit the mounting bracket onto the DIN rail.

(3) Press the installation locking clip to secure it to the DIN rail.

Disassembly method from the DIN rail (see Fig.2):

(1) Insert a flat-head screwdriver (blade width ≤3mm) into the instrument's installation locking clip.

(2) Pry open the installation locking clip slightly to release the instrument from the DIN rail.

(3) Pry open the installation locking clip slightly to release the instrument from the DIN rail.

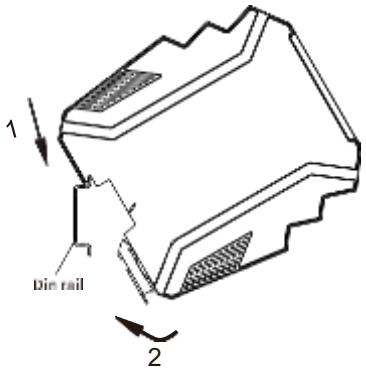


Fig.1: Mounting method

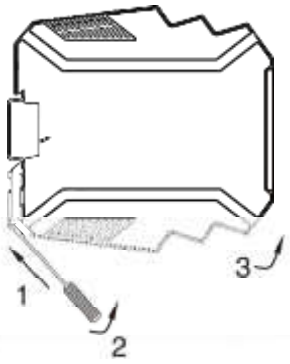


Fig.2 Disassembly method

Ordering Code

AI-I3S -0-P3-A1-C2-PQ						Description
AI-I3S	-	-	-	-	-	
Channel Type	0					One Input, One Output
	2					One Input, Two Outputs
	4					Two Inputs, Two Outputs
Input signal		P3				PT100 Thermoresistor (-50-200℃)
		P4				PT100 Thermoresistor(0-100℃)
		P5				PT100 Thermoresistor (0-200℃)
		P1				PT100 Thermoresistor
		P6				PT1000 Thermoresistor(-50-200℃)
		P2				PT1000 Thermoresistor
		KM				K-type thermocouple (0-500℃)
		KN				K-type thermocouple (0-1100℃)
		KU				K-type thermocouple
		TU				T-type thermocouple
		BU				B-type thermocouple
		RU				R-type thermocouple
		SU				S-type thermocouple
		M2				0-1KΩ
		M4				0-10KΩ
		AU				Full Duplex
		XX				Other
Output Signal			A1			4-20mA Active
			V1			0-10V
			V2			0-5V
			V3			1-5V
			B1			0-20mA Active
			A0			4-20mA Passive
			B0			0-20mA Passive
			XX			Other
Power Supply				C		24VDC
Accessories					PQ	Full Duplex Debugging Line

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