TS-TR Series Thermal Resistance Temperature Isolation Transmitter

● The TS-TR series thermal resistance signal isolator accepts thermal resistance signals from the site and outputs standard current/voltage signals to the control room, PLC, display instruments, DCS, etc. through isolation and transmission.

● Connect the PC upper computer through the miniUSB interface to measure the graduation number, range, and alarm output value of the input signal; Configure the range and type of output range. Equipped with RS485 communication function (customization required).

● This product requires independent power supply and adopts DIN35mm standard guide rail independent installation method (optional bus power supply function); The input, output, and power supply are isolated from each other.

Selection Table

TS-TR	X	X	X	INSTRUCTIONS
Channel	1			1 IN 1 OUT
	2			1 IN 1 OUT
	5			2 IN 2 OUT
Input Signal (Type Of Thermal Resistor)		C5		Cu50(-50～+150℃)
		C1		Cu100(-50～+150℃)
		P1		Pt100(-200～+850℃)
		P2		Pt1000(-200～+250℃)
		P5		Pt500(-200～+250℃)
		N1		Ni100(-60～+180℃)
		N2		Ni1000(-60～+150℃)
		N5		Ni500(-60～+180℃)
		R3		Resistance, Potentiometer (0～3KΩ)
		R5		Resistance, Potentiometer(0～5KΩ)
Output Signal			1	4-20mA
			2	0-20mA
			4	0-5V
			6	0-10V
Note: Customers need to determine the input signal form and output signal form when placing an order. If there are special needs, they can customize it				

Product Selection

Eg: TS-TR5C51/0-100, 2 IN 2 OUT, input signal Cu50 (0-100 ℃), output 4-20mA.

MAIN TECHNICAL PARAMETERS

Input

Input signal: Thermal resistance, resistance, potentiometer and other resistance signal
Allowable line resistance ⩽50Ω (three-wire system)
Over-limit alarm: The input is lower than the lower limit of the range, the output current is about 3.8mA (when the current is output)
The input is higher than the upper limit of the range, the output current is about 20.5mA (when the current is output)
Line break alarm: When the input line is broken, the output current is about 22mA(current output)

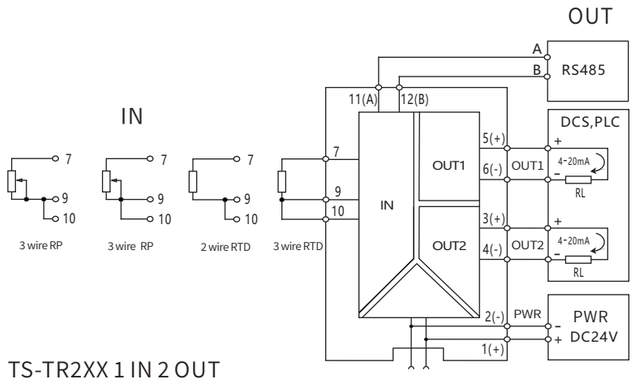
Output

Output signal: Current signal: 0-20mA; Voltage signal: 0-10V(The type and range of current and voltage signal can be set by PC)
Digital signal: RS485(optional, not included by default)
Output load resistance: RL⩽400Ω(output current signal), RL⩾10KΩ(output voltage signal)

General Technical Parameters

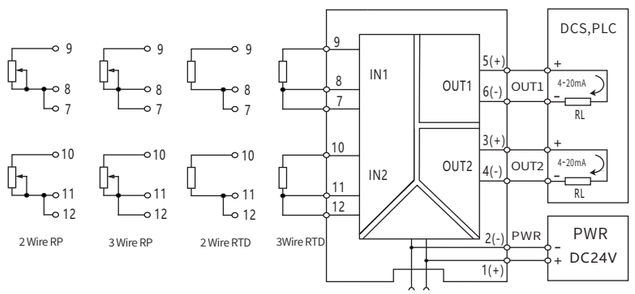
Channels: 1 IN 1 OUT, 1 IN 2 OUT, 2 IN 2 OUT
Power supply: DC24V, voltage range: DC18 ~ 32V
Consumption current: ≤80mA (2 IN 2 OUT, 24V power supply, 20mA output)
Basic accuracy: ±0.1%F.S or ±0.2%F.S (20℃) subject to physical labeling
Temperature drift: ±0.01%F.S/℃ (-20℃ ~ +55℃)
Response time: ≤1S(0-90%) (TYP)
Insulation strength: 1500V AC/1min(between input, output and power supply)
Insulation resistance: ≥100MΩ(input, output, power supply)
Operating temperature range: -20 ~ +55℃ (no condensation, no icing)
Electromagnetic compatibility: In accord with GB/T 18268.1(IEC61326-1)
Applicable field equipment: Thermal resistor, resistor, potentiometer

WIRING DIAGRAM



TS-TR2XX 1 IN 2 OUT

TS-TR1XX contains only one part of channel 1



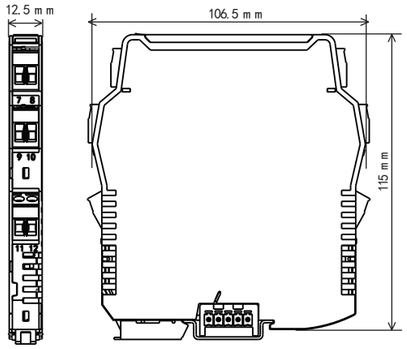
TS-TR5XX 2 IN 2 OUT

Note:
1. Wire heating resistor or potentiometer signal input, terminal 9,10 (TS-TR2XX); 7,8 (TS-TR5XX); 11,12 (TS-TR5XX) Must be short-circuited. Two-wire connections do not eliminate wire resistance, and errors increase.

2. When the three-wire heating resistor or potentiometer signal is input, the resistance value of the three wires should be equal as far as possible.

3. The bus power supply and RS485 output function is optional, if necessary, please specify and purchase the bus power supply module when ordering. TS-TR5XX No 485 output function.

OVERALL DIMENSION



TS-IPXX-EX Series Analog Input Safety Barrier

● The TS-IPXXX-EX series two wire transmitters, three wire transmitters, and current source input isolation safety barriers provide isolation power for transmitters in hazardous areas. At the same time, the 4-20mA signal generated by the transmitter or current source is isolated and transmitted from the hazardous side to the safe side for current or voltage output.

● This product uses DC24V power supply, and the power supply, input, and output are isolated from each other.

● Adopting a 12.5mm ultra-thin shell and DIN35mm standard guide rail independent installation method (optional bus power supply function).

SELECTION TABLE

TS-IP111-EX:1 IN 1 OUT;Dangerous side input signal 0 (4) -20mA; Safety side output signal 0 (4) -20mA.
TS-IP110-EX:1 IN 1 OUT;Dangerous side input signal 4 -20mA; Safety side output signal 4 -20mA,loop power supply.
TS-IP211-EX:1 IN 2 OUT;Dangerous side input signal 0 (4) -20mA; Safety side output signal 0 (4) -20mA.
TS-IP210-EX:1 IN 2 OUT;Dangerous side input signal 0 4 -20mA; Safety side output signal 4 -20mA.loop power supply.

MAIN TECHNICAL PARAMETERS

Danger Side Input

Input signal: 0(4)-20mA
Distributing:Distribution voltage≤28V DC
When 20mA voltage:≥15V
Normal working current:≤25mA

Safety Side Output

Active current output (TS-IP1 (2) 11-EX):0(4)-20mALoad resistance:RL≤300Ω
Passive current output(TS-IP1 (2) 11-EX):4-20mA
Load resistance:RL≤[(Ue-5)/0.02]Ω
External power supply Ue:12-30V DC
Voltage output(TS-IP1 (2) 11-EX):0(1)-5V;Load resistance:RL≥330KΩ
0(2)-10V;Load resistance:RL≥660KΩ
Note:Users need to specify output specifications when placing an order.

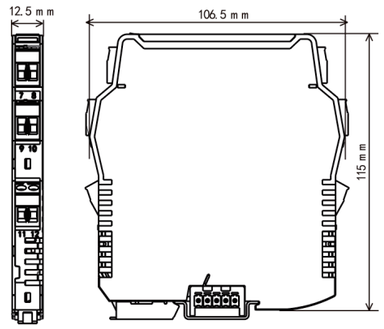
Basic Parameter

Channel: 1 IN 1 OUT,1 IN 2 OUT
Power supply:DC24V,voltage range:DC18~36V
Consumption current: ≤70mA (1 IN 2 OUT,DC24V,when 20mA output)
Basic accuracy: ±0.1%F.S (20℃)
Temperature drift:0.005%F.S/℃ (-20℃~+55℃)
Response time:≤2mS(0-90%)(TYP)
Insulation strength:≥2500VAC/1min(Between local and non local security terminals)
≥500VAC/1min(Between power supply and non intrinsically safe end)
Insulation resistance:≥100MΩ(Local safety end, non local safety end, between power sources)
Working temperature range:-20~+60℃
Electromagnetic Compatibility: According to GB/T 18268.1(IEC61326-1)
Applicable location: Installed in a safe location and can be connected to intrinsically safe instruments located in hazardous areas such as Zone 0, Zone 1, Zone 2, IIC, IIB, IIA, T4-T6.
Applicable Field Equipment: 2Wire,3wire transmitter,current source

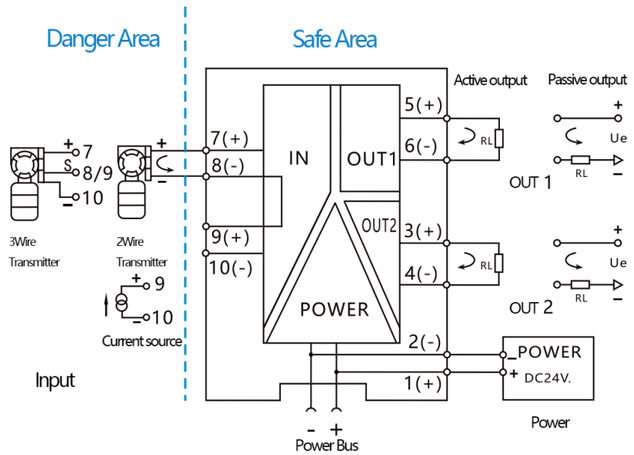
ATEX

Certification of National Instrument Explosion Prevention Safety Supervision and Inspection Station
Explosion proof certificate number: CNEx21.2933
Certification standards: GB3836.1, GB3836.4
Explosion proof sign: [ExiaGa] IIC
Maximum voltage: Um=250V
Authentication parameters (between terminals 7,8,9,10):
Uo=28V, Io=93mA, Po=651mW
IIC: Co=0.083 μ F. Lo=4.0mH
(Between terminals 9 and 10):
Uo=3.5V, Co=100 μ F
Ui=20V, Ii=110mA

OVERALL DIMENSION



WIRING DIAGRAM



TS-IP111-EX,1 IN 1 OUT
TS-IP211-EX,1 IN 2 OUT
Note:TS-IP111-EX,only include input and output 1 part.

Note: The bus power supply function is an optional function.
If the customer needs it, they need to specify it during the order and purchase a bus power supply module separately.

TS-SXSJ-EX Series Switching Input Relay Output Safety Barrier

● The TS-IPXXX-EX series two wire transmitters, three wire transmitters, and current source input isolation safety barriers provide isolation power for transmitters in hazardous areas. At the same time, the 4-20mA signal generated by the transmitter or current source is isolated and transmitted from the hazardous side to the safe side for current or voltage output.

● This product uses DC24V power supply, and the power supply, input, and output are isolated from each other, while the input channels are not isolated.

● Adopting 12.5mm ultra-thin shell and DIN35mm standard guide rail independent installation method (optional bus power supply function).

SELECTION TABLE

TS-S1SJ-EX:1 IN 1 OUT;Dangerous side input signal:PLC; Safety side output signal:relay contacts.
TS-S2SJ-EX:1 IN 2 OUT;Dangerous side input signal:PLC; Safety side output signal:relay contacts.
TS-S5SJ-EX:2 IN 2 OUT;Dangerous side input signal:PLC; Safety side output signal:relay contacts.

MAIN TECHNICAL PARAMETERS

Danger Side Input

Input signal: Dry contact or NAMUR type proximity switch
Open circuit voltage:≈8V
Short-circuit current:≈8mA

Output Characteristics of Safety Side Relay

Response time:⩽10mS
Driving capability:250V AC,2A or 30V ,DC.2A
Load type:Resistance load

Input and Output Characteristics (Set to in-phase Control)

When the on-site switch is closed or the input circuit current is>2.1mA, the output relay is closed, and the channel indicator light is displayed in green.The on-site switch is open or the input circuit current is less than 1.2mA, the output relay is open, and the channel indicator light is off.

Switch Setting Function

Status	K1(Output 1),K3(Output 2)	K2(Output 1),K4(Output 2)
ON	Inverted input and output	Equipped with line fault detection function
OFF	Input and output in phase	No line fault detection function

Note: Switch input (I) requires K2 and K4 to be set to the OFF state, with no line fault (open circuit, short circuit) detection function; If priority circuit fault (open circuit, short circuit) detection function is required, a 22K Ω resistor should be connected in parallel at both ends of the switch, and a series connection of 680 Ω should be made, as shown in switch (II). K2 and K4 should be set to the ON state. When a circuit fault occurs, the indicator light of the corresponding channel is displayed in red.

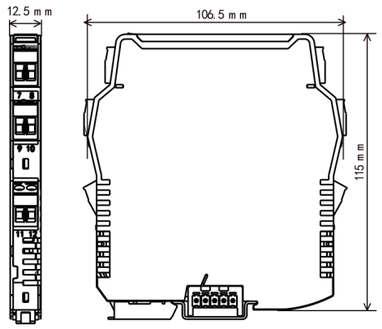
Basic Parameter

Power supply:DC24V,voltage range:DC15~36V
Consumption current: (24V power supply, when the relay is on)
⩽20mA（TS-S1SJ-EX,1 IN 2 OUT）
⩽35mA（TS-S5SJ-EX,1 IN 2 OUT，2IN 2 OUT）
Insulation strength:⩾2500VAC/1min(Between local and non local security terminals)
⩾500VAC/1min(Between power supply and non intrinsically safe end)
Insulation resistance:⩾100MΩ(Local safety end, non local safety end, between power sources)
Working temperature range:-20~+60℃
Electromagnetic Compatibility: According to GB/T 18268.1(IEC61326-1)
Applicable location: Installed in a safe location and can be connected to intrinsically safe instruments located in hazardous areas such as Zone 0, Zone 1, Zone 2, IIC, IIB, IIA, T4-T6.
Applicable Field Equipment: Field devices such as dry contacts or NAMUR type proximity switch inputs that meet the DIN19234 standard (including intrinsically safe pressure switches, temperature switches, and liquid switches).

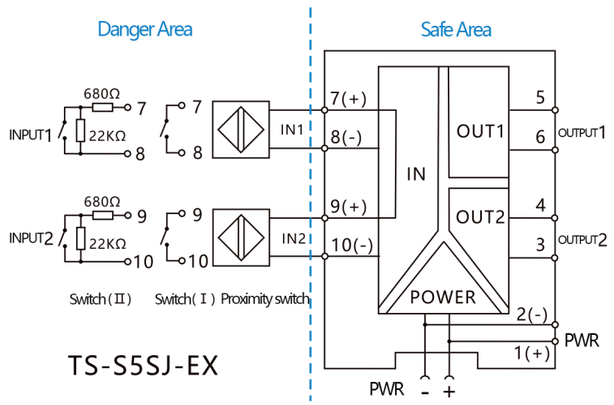
ATEX

Certification of National Instrument Explosion Prevention Safety Supervision and Inspection Station
Explosion proof certificate number: CNEx21.2934
Certification standards: GB3836.1, GB3836.4
Explosion proof sign: [ExiaGa] IIG
Maximum voltage: Um=250V
Authentication parameters (between terminals 7,8,9,10):
Uo=10.5V, Io=14mA, Po=37mW
IIC: Co=2.4 μ F, Lo=70mH

OVERALL DIMENSION



WIRING DIAGRAM



TS-S5SJ-EX,1 IN 1 OUT

Note:TS-S1SJ-EX,only include input and output 1 part.
TS-S2SJ-EX,only include input and output 1 part.
Note: The bus power supply function is an optional function.
If the customer needs it, they need to specify it during the order and purchase a bus power supply module separately.

TS-SXST-EX Series Switching Input Transistor Output Safety Barrier

● The TS-SXST-EX series switch input, transistor output isolated safety barrier, receives switch or proximity switch inputs from hazardous areas, and transmits them to the safety zone transistor output through safety barrier isolation. Each channel can be independently set for input and output in-phase or reverse phase control, and also has input line fault detection alarm indication function.

● This product uses DC24V power supply, and the power supply, input, and output are isolated from each other, while the input channels are not isolated.

● Adopting a 12.5mm ultra-thin shell and DIN35mm standard guide rail independent installation method (optional bus power supply function).

SELECTION TABLE

TS-S1ST-EX:1 IN 1 OUT;Dangerous side input signal:Switching quantity; Safety side output signal: transistor output.
TS-S2ST-EX:1 IN 2 OUT;Dangerous side input signal:Switching quantity; Safety side output signal: transistor output.
TS-S5ST-EX:2 IN 2 OUT;Dangerous side input signal:Switching quantity; Safety side output signal: transistor output.

MAIN TECHNICAL PARAMETERS

Danger Side Input

Input signal:Dry contact or NAMUR type proximity switch, frequency: ⩽ 5KHz
Open circuit voltage:≈8V
Short-circuit current:≈8mA

Output Characteristics of Safety Side Relay

Level output:4.5V⩽VH⩽12V;VL⩽0.5V
Driving current:10mA;Load resistance:⩾1KΩ
Transistor collector output:
High level:Vcc
Low level:⩽2.5V(Driving current=10mA,Vcc=24V)
Max driving current⩽40mA,Load resistance:2KΩ⩽RL⩽10KΩ
Note: 'Vcc' refers to the external power supply voltage at the output end. Vcc ⩽ 40V

Input and Output Characteristics (Set to in-phase Control)

When the on-site switch is closed or the input circuit current is>2.1mA, output transistor conduction, and the channel indicator light is displayed in green.The on-site switch is open or the input circuit current is less than 1.2mA, output transistor not conducting, and the channel indicator light is off.

Switch Setting Function

Status	K1(Output 1),K3(Output 2)	K2(Output 1),K4(Output 2)
ON	Inverted input and output	Equipped with line fault detection function
OFF	Input and output in phase	No line fault detection function

Note: Switch input (I) requires K2 and K4 to be set to the OFF state, with no line fault (open circuit, short circuit) detection function; If priority circuit fault (open circuit, short circuit) detection function is required, a 22K Ω resistor should be connected in parallel at both ends of the switch, and a series connection of 680 Ω should be made, as shown in switch (II). K2 and K4 should be set to the ON state. When a circuit fault occurs, the indicator light of the corresponding channel is displayed in red.

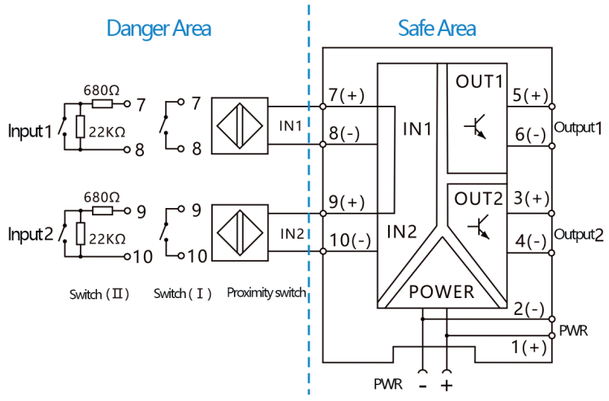
Basic Parameter

Power supply:DC24V,voltage range:DC15~36V
Consumption current: (24V power supply, When the transistor is on)
⩽25mA (TS-S1SJ-EX,1 IN 1 OUT)
⩽35mA（TS-S5SJ-EX,1 IN 2 OUT，2IN 2 OUT）
Insulation strength:⩾2500VAC/1min(Between local and non local security terminals)
⩾500VAC/1min(Between power supply and non intrinsically safe end)
Insulation resistance:⩾100MΩ(Local safety end, non local safety end, between power sources)
Working temperature range:-20~+60℃
Electromagnetic Compatibility: According to GB/T 18268.1(IEC61326-1)
Applicable location: Installed in a safe location and can be connected to intrinsically safe instruments located in hazardous areas such as Zone 0, Zone 1, Zone 2, IIC, IIB, IIA, T4-T6.
Applicable Field Equipment: Field devices such as dry contacts or NAMUR type proximity switch inputs that meet the DIN19234 standard (including intrinsically safe pressure switches, temperature switches, and liquid switches).

ATEX

Certification of National Instrument Explosion Prevention Safety Supervision and Inspection Station
Explosion proof certificate number: CNEx21.2935
Certification standards: GB3836.1, GB3836.4
Explosion proof sign: [ExiaGa] IIG
Maximum voltage: Um=250V
Authentication parameters (between terminals 7,8,9,10):
Uo=10.5V, Io=14mA, Po=37mW;IIC: Co=2.4 μ F, Lo=70mH

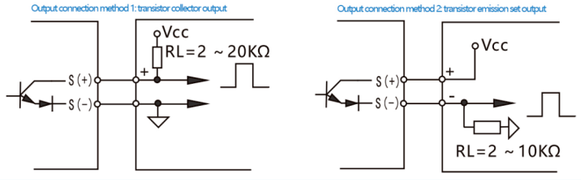
WIRING DIAGRAM



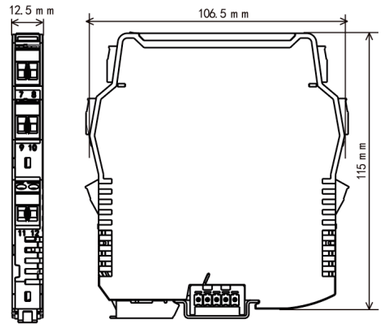
TS-S5ST-EX

Note:TS-S1ST-EX,only include input 1 and output 1 part.
TS-S2ST-EX,only include input and output 1 part.

Note: The bus power supply function is an optional function. If the customer needs it, they need to specify it during the order and purchase a bus power supply module separately.



OVERALL DIMENSION



TM-IP511/0-EX Series Analog Input Safety Barrier

● The TM-IP511/0-EX series two wire transmitters, three wire transmitters, and current source input isolation safety barriers provide isolation power for transmitters in hazardous areas, while isolating and transmitting 4-20mA generated by the transmitter or current source from the hazardous side to the safe side for current or voltage output.

● This product uses DC24V power supply, and the power supply, input, and output are isolated from each other.

● Adopting a 17.5mm ultra-thin shell and DIN35mm standard guide rail independent installation method (with bus power supply function).

SELECTION TABLE

TS-IP511-EX:2 IN 2 OUT;Dangerous side input signal:0(4)-20mA; Safety side output signal:0(4)-20mA.
TS-IP510-EX:2 IN 2 OUT;Dangerous side input signal:4-20mA; Safety side output signal:4-20mA.
Loop power supply.

MAIN TECHNICAL PARAMETERS

Danger Side Input

Input signal:0(4)-20mA
Distributing:distribution voltage≤28VDC
20mA Voltage:≥15V
Nomal working current:≤25mA

Safety Side Input

Active current output (TM-IP511-EX):0(4)-20mA
Load resistance:RL≤300Ω
Passive current output(TM-IP510-EX):4-20mA
Load resistance:RL≤[(Ue-5)/0.02]Ω
External power supply:12-30V DC
Voltage output(TM-IP511-EX):0(1)-5V;Load resistance:RL≥330KΩ
0(2)-10V;Load resistance:RL≥660KΩ
Note:Users need to specify output specifications when placing an order.

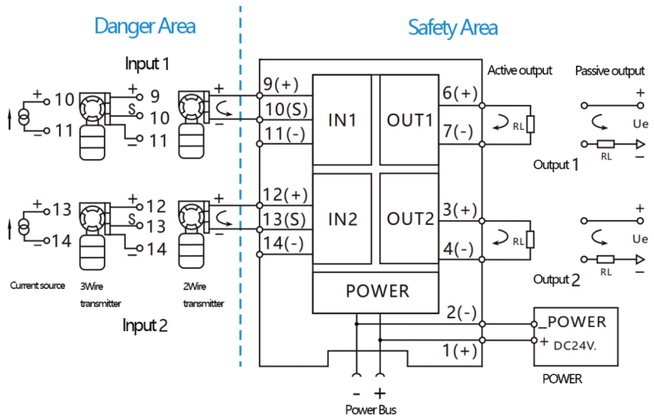
Basic Parameter

Channel: 2 IN 2 OUT
Power supply:DC24V,voltage range:DC18~36V
Consumption current: ≤100mA (2 IN 2 OUT,DC24V,when 20mA output)
Basic accuracy: ±0.1%F.S(20℃)
Temperature drift:0.005%F.S/℃(-20℃~+55℃)
Response time:≤2mS(0-90%)(TYP)
Insulation strength:≥2500VAC/1min(Between local and non local security terminals)
≥500VAC/1min(Between power supply and non intrinsically safe end)
Insulation resistance:≥100MΩ(Local safety end, non local safety end, between power sources)
Working temperature range:-20~+60℃
Electromagnetic Compatibility: According to GB/T 18268.1(IEC61326-1)
Applicable location: Installed in a safe location and can be connected to intrinsically safe instruments located in hazardous areas such as Zone 0, Zone 1, Zone 2, IIC, IIB, IIA, T4-T6.
Applicable Field Equipment: 2Wire,3wire transmitter,current source

ATEX

Certification of National Instrument Explosion Prevention Safety Supervision and Inspection Station
Explosion proof certificate number: CNEx21.2932
Certification standards: GB3836.1, GB3836.4
Explosion proof sign: [ExiaGa] IIG
Maximum voltage: Um=250V
(between terminals 9,10,11;12,13,14):
Uo=28V, Io=93mA, Po=651mW;IIC: Co=0.083 μ F, Lo=4.0mH
(between terminals 10,11;13,14):
Uo=1.2V, Co=100 μ F, Ui=20V,Ii=110mA

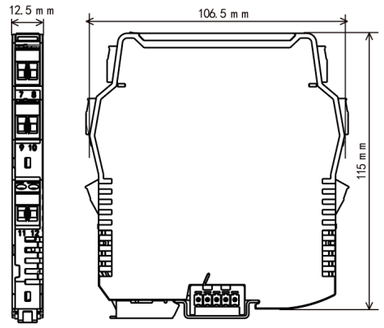
WIRING DIAGRAM



TM-IP511/0-EX 2 IN 2 OUT

Note: The bus power supply function is an optional function.
If the customer needs it, they need to specify it during the order and purchase a bus power supply module separately.

OVERALL DIMENSION



TM-I0X11-EX Series Analog Output Safety Barrier

- The TM-I0X11-EX series operating end isolation safety barrier isolates and transmits 4-20mA signals from the safety zone to the danger zone, driving on-site actuators and other equipment.

- This product uses DC24V power supply, and the power supply, input, and output are isolated from each other.

- Adopting a 17.5mm ultra-thin shell and DIN35mm standard guide rail independent installation method (with bus power supply function).

SELECTION TABLE

TM-I0111-EX:1 IN 1 OUT;Dangerous side input signal:0(4)-20mA; Safety side output signal:0(4)-20mA.
TS-I0511-EX:2 IN 2 OUT;Dangerous side input signal:4-20mA; Safety side output signal:4-20mA.
Loop power supply.

MAIN TECHNICAL PARAMETERS

Safety Side Input

Input signal:0(4)-20mA

Danger Side Output

Current output:0(4)-20mA
Load resistance:RL≤800Ω
Voltage output:0(1)-5V
Load resistance:RL≥330KΩ
Note:Users need to specify output specifications when placing an order.

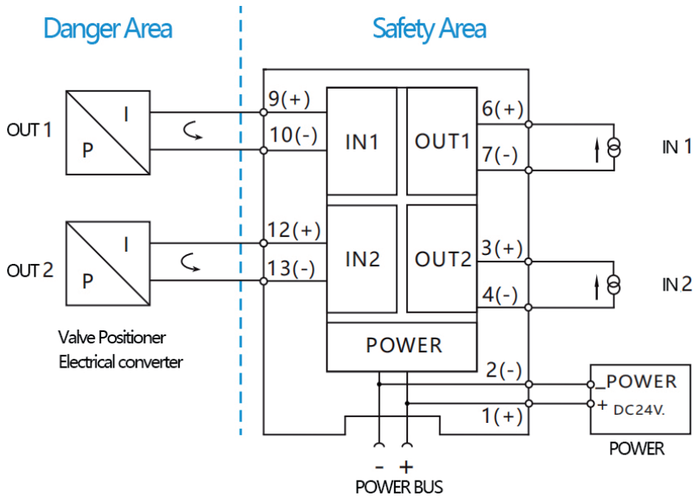
Basic Parameter

Channel: 1 IN 1 OUT (TM-I0111-EX)
2 IN 2 OUT (TM-I0511-EX)
Power supply:DC24V,voltage range:DC18~36V
Consumption current: ≤100mA (2 IN 2 OUT,DC24V,when 20mA output)
Basic accuracy: ±0.1%F.S (20℃)
Temperature drift:0.005%F.S/℃ (-20℃~+55℃)
Response time:≤2mS(0-90%)(TYP)
Insulation strength:≥2500VAC/1min(Between local and non local security terminals)
≥500VAC/1min(Between power supply and non intrinsically safe end)
Insulation resistance:≥100MΩ(Local safety end, non local safety end, between power sources)
Working temperature range:-20~+60℃
Electromagnetic Compatibility: According to GB/T 18268.1(IEC61326-1)
Applicable location: Installed in a safe location and can be connected to intrinsically safe instruments located in hazardous areas such as Zone 0, Zone 1, Zone 2, IIC, IIB, IIA, T4-T6.
Applicable Field Equipment: Two wire valve positioner, electrical converter

ATEX

Certification of National Instrument Explosion Prevention Safety Supervision and Inspection Station
Explosion proof certificate number: CNEx21.2931
Certification standards: GB3836.1, GB3836.4
Explosion proof sign: [ExiaGa] IIG
Maximum voltage: Um=250V
(between terminals 9,10,11;12,13):
Uo=28V, Io=93mA, Po=651mW;IIC: Co=0.083 μ F, Lo=4.0mH

WIRING DIAGRAM



TM-I0511-EX 2 IN 2 OUT

Note:TM-I0111-EX Only include input 1 and output 1 part.

Note: The bus power supply function is an optional function.
If the customer needs it, they need to specify it during the order and purchase a bus power supply module separately.

OVERALL DIMENSION