



Quality Service

Isolated barriers Product overview



AM1000EX Series
Isolated Barrier



AM2000EX Series
Isolated Barrier



AMG1000 Series
Isolator



AML1000 Series
SPD for signal



AML1000 Series
SPD for AC Power



AD10 Series
Power Transmitter

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Company profile



Hangzhou HollySys Automation Co.,Ltd.



Founded in 1993, HollySys specializes in process automation, factory automation, rail automation and mechanical & engineering solutions. With the service philosophy 'Customers in mind with sincerity', HollySys had successfully applied over 20,000 sets of control system serving nearly 10,000 customers, HollySys has already become an international leading provider in automation control field. HollySys listed its common stock on NASDAQ in 2008 under the stock quote HOLI. After more than 20 years of stable growth, HollySys is growing into a global company, and strive to create more value to society and bring better life to human being by supplying cutting-edge products based on its control, safety and information technologies.

In the field of process automation, the industrial control system of HollySys is used in major engineering and key technology devices such as million-KW large-scale ultra-supercritical thermal power plants, 10-million-tonne oil refining equipment, and million-KW nuclear power plant instrumentation and control systems. Over 12,000 sets are used in thermal power, petrochemical, fine chemicals, metallurgy, construction materials, and F&B.

HollySys developed its own PLC and MC series motion controller for factory automation. It is CE and UL certified, and its products are widely used in railway, mine shafts, oilfields, water treatment, and machine equipment control.

HollySys' Safety Barrier and Isolator adheres to HollySys' tradition of constant pursuit for excellence for its automation control systems. It is easy to use, stable, and reliable, earning it industry recognition.



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AM1000EX Series Isolated Barrier

AM1000EX series isolated barriers adopt electromagnetic coupling technology to realize reliable isolation among power, signal input and signal output. They are more reliable and safer than Zener barriers without intrinsically safe grounding, which greatly enhances anti-interference capability of detection and control circuit. They are universal isolated barriers which can meet variety matching of intrinsically safe instruments at field.

Characteristic

Power supply: Independent power supply

Channels: 1, 1/2, 2

Function: Transmit signal isolatedly, Transmission conversion Distribution

Signal match and intrinsically safe instruments:

- Switch, Proximity detector input
- Intrinsically safe power output which drive intrinsically safe solenoid valve and indicator
- 2-wire/3-wire transmitter input(including HART)
- Current signal input/output
- TC, mV, RTD input

Standards and Certificates

Standards:

- GB 3836.1-2010
- GB 3836.4-2010
- GB 3836.20-2010
- GB/T 19001-2008 identical to ISO9001:2008

Certificates:

- National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation(NEPSI)
- AM1000EX series, Certificate Number: GYB15.1144

Table 1 Input signal and range list

	Type	Range	Min. Span	Accuracy
TC	T	-200℃ ~ +400℃	50℃	0.5℃ / 0.1%
	E	-200℃ ~ +900℃	50℃	0.5℃ / 0.1%
	J	-200℃ ~ +1200℃	50℃	0.5℃ / 0.1%
	K	-200℃ ~ +1372℃	50℃	0.5℃ / 0.1%
	N	-200℃ ~ +1300℃	50℃	0.5℃ / 0.1%
	R	-40℃ ~ +1768℃	500℃	1.5℃ / 0.1%
	S	-40℃ ~ +1768℃	500℃	1.5℃ / 0.1%
	B	+320℃ ~ +1820℃	500℃	1.5℃ / 0.1%
mV		-100mV ~ +100mV	10mV	20μV / 0.1%
RTD	Pt100	-200℃ ~ +850℃	20℃	0.2℃ / 0.1%
	Cu50	-50℃ ~ +150℃	20℃	0.2℃ / 0.1%
	Cu100	-50℃ ~ +150℃	20℃	0.2℃ / 0.1%

Notes

- "%" of output accuracy is relative to the setting range, should take a bigger of relative error and absolute error as the output accuracy in application.
- TC input, transfer accuracy not contain cold junction compensation error, every increase in compensation wire 100Ω, cold junction error increase 0.2℃.
- TC type B input, the lower limits of temperature range must be greater than 680℃, to meet the accuracy specifications.
- mV signal need to be customized.

General Technical Parameters

Power supply protection: Reverse Protection

Safety isolation: Isolated safety voltage of 250V AC between safe area and hazardous area

Dielectric strength: 2500V AC; 1min (Between intrinsically safe part and non-intrinsically safe part)

EMC:

According to GB/T 18268 (IEC 61326-1)

ESD: Air Discharge 8kV

EFT/Burst: Power ports 2kV, I/O signal ports 1kV

Surge: Line to Ground 2kV, Line to Line 1kV

Electromagnetic Field: 10V/m

Operation conditions:

The air should not contain any medium corrupting the coat of chrome, nickel and silver. Moreover, violent quiver and impact or any cause of electromagnetic induction (such as big current or spark, etc.) must be avoided when using.

Ambient temperature: -20℃ ~ +60℃

Relative humidity: 10% ~ 90%

Storage conditions:

Temperature: -40℃ ~ +80℃

Relative humidity: 10% ~ 90%

Structure and Dimensions

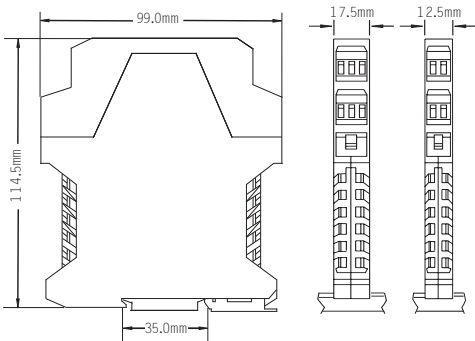
Structure: DME series plastic-case

Installation: Mounting on DIN35mm guide rail in safe area

Terminals: Pluggable, blue terminals connected to signal in intrinsically safe side, grey terminals connected to signal in non-intrinsically safe side, multi or single wire of 0.5mm²~2.5mm² can be accessed.

Dimensions: 114.5mm × 99.0mm × 12.5mm

114.5mm × 99.0mm × 17.5mm



AM1000EX Series Isolated Barrier

Field instruments	Type	Model	Channels	Hazardous area	Non-Hazardous area	Feature	Page
	DI	AM1011EX	1	Switch/Proximity detector	Relay Output	LFD	3
		AM1013EX	1/2	Input			
		AM1012EX	2				
	DO	AM1021EX	1	Output voltage ≥ 12V	Switch Input	Loop-powered	4
		AM1022EX	2	at 45mA drive current			
	AI	AM1031EX	1	2-wire/3-wire transmitter	0/4 ~ 20mA, 0/1 ~ 5V	Independent power supply	5
		AM1032EX	1/2	Current source Input	HART		
	AO	AM1041EX	1	0/4 ~ 20mA, 0/1 ~ 5V HART	0/4 ~ 20mA Input	Independent power supply	6
	TC mV	AM1051EX	1	TC/mV Input	0/4 ~ 20mA, 0/1 ~ 5V	Programmable	7
		AM1052EX	1/2		Output	Independent power supply	
	RTD	AM1061EX	1	RTD Input	0/4 ~ 20mA, 0/1 ~ 5V	Programmable	8
		AM1062EX	1/2		Output	Independent power supply	

1 input 1 output: AM1011EX
 1 input 2 outputs: AM1013EX
 2 inputs 2 outputs: AM1012EX

Digital input, relay output isolated barrier, transfer switches or proximity detectors from hazardous area to safe area. Switches are provided to select phase reversal and to enabled the line fault detection. The product needs an independent power supply.

Specification

Hazardous area input	
Input signal	Switch or NAMUR proximity detector, Frequency≤10Hz
Open circuit voltage	≈8V
Short circuit current	≈8mA
Safe area output	
Drive ability	250V AC, 2A or 30V DC, 2A, Resistive load
Response time	≤10ms
Input and output characteristics (Normal phase)	If input >2.1mA, output relay is energized, with yellow LED ON If input <1.2mA, output relay is de-energized, with yellow LED OFF
Phase reversal	et by K1、K2、K3、K4, see detail in user manuals
LFD function	22kΩ in parallel with switch, 680Ω in series with switch(see switch II below), K2、K4 set to state ON
General parameter	
Supply voltage	20~35V DC
Power supply protection	Reverse Protection
Current consumption	≤30mA (AM1011EX) ≤40mA (AM1012EX、AM1013EX)
Dielectric strength(Non IS~ IS; Power~Non IS)	2500V AC; 1min; 500V AC; 1min
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20℃~+60℃
Suitable IS apparatus and suitable location	Switch or DIN 19234 standard NAMUR proximity detector input field devices(including intrinsically safe type pressure switch, temperature switch and liquid level switch); Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Structure and Dimensions

AM1011EX: 114.5mm×99.0mm×12.5mm
 AM1012EX: 114.5mm×99.0mm×17.5mm
 AM1013EX: 114.5mm×99.0mm×17.5mm



Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (Um): 250V

Intrinsic safety parameter:

Terminals (between 7、8), (between 10、11)

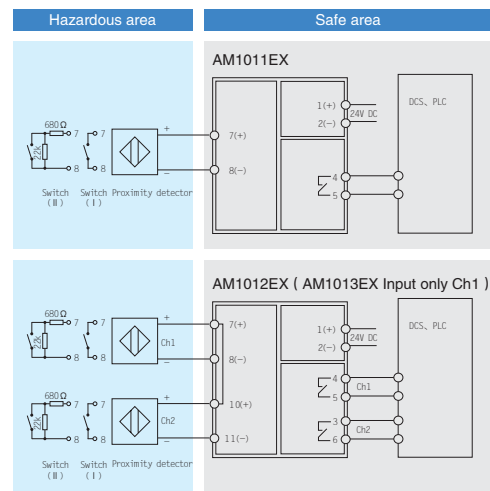
U₀=10.5V, I₀=14mA, P₀=37mW

II C: C₀=2.4μF, L₀=165mH

II B: C₀=16.8μF, L₀=495mH

II A: C₀=75.0μF, L₀=1000mH

Application

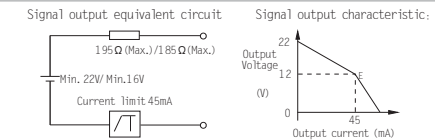


1 input 1 output: AM1021EX
 2 inputs 2 outputs: AM1022EX

12V/45mA drive, digital output isolated barrier, enables intrinsically safe devices such as solenoid valves and alarm transmitters located in hazardous area to be controlled from safe area. Allow control switch to connect directly to the either side of 24V power supply circuit.

Specification

Hazardous area output	
Open circuit voltage	22~24V
Output voltage at 45mA	≥12V
Safe area input	
General parameter	
Supply voltage	20~35V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 45mA output)	≤75mA (AM1021EX); ≤160mA (AM1022EX)
Response time	≤20ms
Dielectric strength(Non IS part~IS part)	2500V AC; 1min
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20℃~+60℃
Suitable IS apparatus and suitable location	Intrinsically safe field devices such as solenoid valves and alarm transmitters Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area



Structure and Dimensions

AM1021EX: 114.5mm×99.0mm×12.5mm
 AM1022EX: 114.5mm×99.0mm×17.5mm



Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (Um): 250V

Intrinsic safety parameter:

Terminals (between 7、8), (between 10、11)

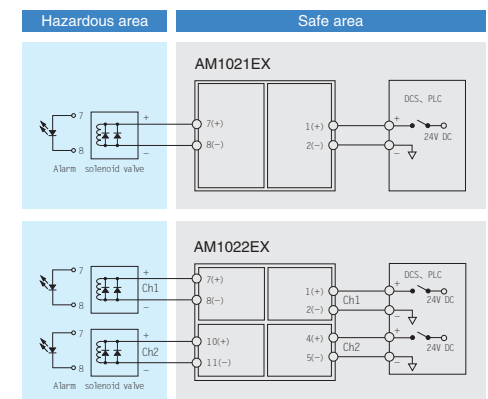
U₀=25V, I₀=140mA, P₀=875mW

II C: C₀=0.11μF, L₀=1.32mH

II B: C₀=0.84μF, L₀=3.96mH

II A: C₀=2.97μF, L₀=10.56mH

Application



1 input 1 output: AM1031EX
1 input 2 outputs: AM1032EX

Analog input isolated barrier, provide isolated power supplies for transmitters which located in hazardous area. Transfer current signal generated by the transmitter or current source from hazardous area to safe area separately. The product should be supplied power independently. Input, output and power are each galvanically isolated.

Specification

Hazardous area input	
Input signal	0/4 ~ 20mA, HART
Open circuit voltage	≤ 28V
Distribution voltage at 20mA	≥ 15.5V
Safe area output	
Output current	0/4 ~ 20mA, HART
Load resistance	$R_L \leq 550 \Omega$ (AM1031EX); $R_L \leq 300 \Omega$ (AM1032EX)
Load resistance with HART	$R_L \geq 250 \Omega$
Output voltage	0/1 ~ 5V
Load resistance	$R_L \geq 300k \Omega$
General parameter	
Supply voltage	20 ~ 35V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 20mA output)	≤ 60mA (AM1031EX); ≤ 75mA (AM1032EX)
Response time	Reach 90% of final value in 2ms
Transfer accuracy (20°C, 4~20mA)	0.1%F.S. (Typical: 0.05%F.S.)
Temperature drift (-20°C~+60°C)	0.005%F.S./°C
Dielectric strength(Non IS~ IS; Power~Non IS)	2500V AC; 1min; 500V AC; 1min
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20°C ~ +60°C
Suitable IS apparatus and suitable location	2-wire/3-wire transmitter, current source Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation(NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (U_m) : 250V

Intrinsic safety parameter:

Terminals (Among 7、8、9)

$U_0=28V$, $I_0=93mA$, $P_0=651mW$

II C: $C_0=0.083 \mu F$, $L_0=4.2mH$

II B: $C_0=0.65 \mu F$, $L_0=12.6mH$

II A: $C_0=2.15 \mu F$, $L_0=33.6mH$

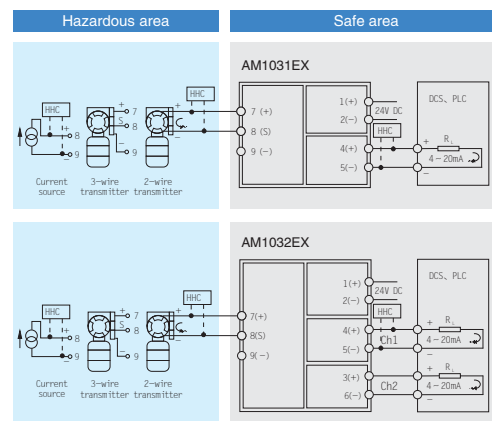
Structure and Dimensions

AM1031EX: 114.5mm × 99.0mm × 12.5mm

AM1032EX: 114.5mm × 99.0mm × 17.5mm



Application



1 input 1 output: AM1041EX

Analog output isolated barrier, accept current signal from safe area to drive equipments like valve positioner and electric converter in hazardous area. The product should be supplied power independently. Input, output and power are each galvanically isolated.

Specification

Hazardous area output	
Output current	(Voltage or current output should be specified when ordering) 0/4 ~ 20mA, HART
Load resistance	$R_L \leq 800 \Omega$
Load resistance with HART	$R_L \geq 250 \Omega$
Output voltage	0/1 ~ 5V
Load resistance	$R_L \geq 300k \Omega$
Safe area input	
Input signal	0/4 ~ 20mA, HART
Voltage drop	≤ 2V
General parameter	
Supply voltage	20 ~ 35V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 20mA output)	≤ 50mA
Response time	Reach 90% of final value in 2ms
Transfer accuracy (20°C, 4~20mA)	0.1%F.S. (Typical: 0.05%F.S.)
Temperature drift (-20°C~+60°C)	0.01%F.S./°C
Dielectric strength(Non IS~ IS; Power~Non IS)	2500V AC; 1min; 500V AC; 1min
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20°C ~ +60°C
Suitable IS apparatus and suitable location	2-wire valve positioner, electric converter Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation(NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (U_m) : 250V

Intrinsic safety parameter:

Terminals (between 7、8)

$U_0=28V$, $I_0=93mA$, $P_0=651mW$

II C: $C_0=0.083 \mu F$, $L_0=4.2mH$

II B: $C_0=0.65 \mu F$, $L_0=12.6mH$

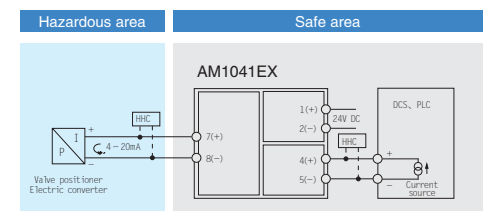
II A: $C_0=2.15 \mu F$, $L_0=33.6mH$

Structure and Dimensions

AM1041EX: 114.5mm × 99.0mm × 12.5mm



Application



TC (Programmable)

1 input 1 output: AM1051EX
1 input 2 outputs: AM1052EX

Programmable, TC input isolated barrier, convert thermal couple, mV signal in hazardous area into 0/4~20mA or 0/1~5V signal. It is intelligent and has cold junction compensation function. TC type and range can be configured through computer. The product should be supplied power independently. Input, output and power are each galvanically isolated.

Specification

Hazardous area input	
Input signal	(Signal type and range should be specified when ordering or self programming)
Safe area output	See table 1 in P1
Output current	(Voltage or current output should be specified when ordering)
Load resistance	0/4 ~ 20mA
Output voltage	$R_L \leq 300 \Omega$
Load resistance	0/1 ~ 5V
Alarm directions	$R_L \geq 20k \Omega$
	Lower than range, LED L flashing, output current $\approx 3.8mA$; Higher than range, LED H flashing, output current $\approx 20.8mA$; Breakage, LED L and H flashing at the same time, output current $\approx 20.8mA$
General parameter	
Supply voltage	20 ~ 35V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 20mA output)	$\leq 35mA$ (AM1051EX) ; $\leq 55mA$ (AM1052EX)
Response time	Reach 90% of final value in 1s
Transfer accuracy (20°C, 4~20mA)	See table 1 in P1 (Cold junction compensation error not included)
Cold junction compensation	$\pm 1^\circ C$ (Compensation range: $-20^\circ C \sim +60^\circ C$)
Temperature drift ($-20^\circ C \sim +60^\circ C$)	0.01%F.S./ $^\circ C$
Dielectric strength(Non IS~ IS; Power~Non IS)	2500V AC;1min; 500V AC;1min
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	$-20^\circ C \sim +60^\circ C$
Suitable IS apparatus and suitable location	TC including T, E, J, K, N, R, S, B, mV signal sensor; Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation(NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (U_m) : 250V

Intrinsic safety parameter:

Terminals (Among 7, 8, 9)

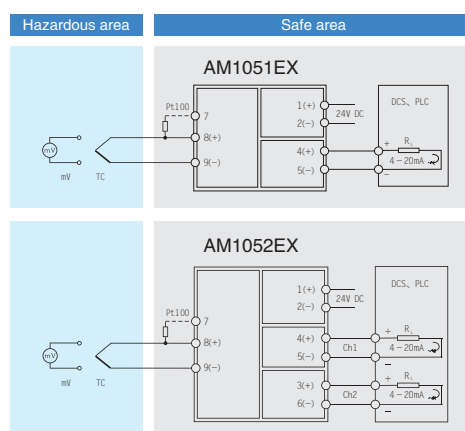
$U_0=8.5V$, $I_0=20mA$, $P_0=43mW$

II C: $C_0=6.5\mu F$, $L_0=3.6mH$

II B: $C_0=60\mu F$, $L_0=10.8mH$

II A: $C_0=1000\mu F$, $L_0=28.8mH$

Application



Structure and Dimensions

AM1051EX: 114.5mm × 99.0mm × 17.5mm
AM1052EX: 114.5mm × 99.0mm × 17.5mm



RTD (Programmable)

1 input 1 output: AM1061EX
1 input 2 outputs: AM1062EX

Programmable, RTD input isolated barrier, convert 2-wire/3-wire RTD signal in hazardous into 4~20mA or 1~5V linearly. It is intelligent, RTD type and range can be configured through computer. The product should be supplied power independently. Input, output and power are each galvanically isolated.

Specification

Hazardous area input	
Input signal	(Signal type and range should be specified when ordering or self programming)
Safe area output	See table 1 in P1
Output current	(Voltage or current output should be specified when ordering)
Load resistance	0/4 ~ 20mA
Output voltage	$R_L \leq 300 \Omega$
Load resistance	0/1 ~ 5V
Alarm directions	$R_L \geq 20k \Omega$
	Lower than range, LED L flashing, output current $\approx 3.8mA$; Higher than range, LED H flashing, output current $\approx 20.8mA$; Breakage, LED L and H flashing at the same time, output current $\approx 20.8mA$; Short circuit, LED L and H flashing at the same time, current $\approx 3mA$.
General parameter	
Supply voltage	20 ~ 35V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 20mA output)	$\leq 35mA$ (AM1061EX) ; $\leq 55mA$ (AM1062EX)
Response time	Reach 90% of final value in 1s
Transfer accuracy (20°C, 4~20mA)	See table 1 in P1
Temperature drift ($-20^\circ C \sim +60^\circ C$)	0.01%F.S./ $^\circ C$
Dielectric strength(Non IS~ IS; Power~Non IS)	2500V AC;1min; 500V AC;1min
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	$-20^\circ C \sim +60^\circ C$
Suitable IS apparatus and suitable location	2-wire/3-wire RTD; Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation(NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (U_m) : 250V

Intrinsic safety parameter:

Terminals (Among 7, 8, 9)

$U_0=8.5V$, $I_0=20mA$, $P_0=43mW$

II C: $C_0=6.5\mu F$, $L_0=3.6mH$

II B: $C_0=60\mu F$, $L_0=10.8mH$

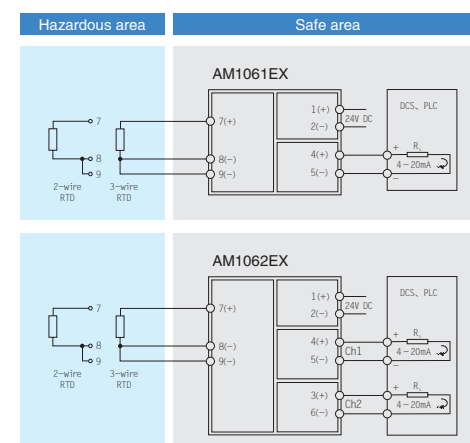
II A: $C_0=1000\mu F$, $L_0=28.8mH$

Structure and Dimensions

AM1061EX: 114.5mm × 99.0mm × 12.5mm
AM1062EX: 114.5mm × 99.0mm × 17.5mm



Application



Notes: 1. 3-wire RTD input, ensure resistance of 3 wire equal as far as possible;
2. 2-wire RTD input, terminals 8 & 9 must be shorted.

AM2000EX Series Isolated Barrier

AM2000EX series isolated barriers with interface module and termination board are used to connect intrinsically safe equipments in hazardous area. Each module has 1 analog or 2 digital isolation channels. Each module has 2 connectors to install on termination board, one is used to intrinsically safe circuit, the other is used to non-intrinsically safe circuit. Termination board is installed in plastic shell, the shell can be mounted on DIN rail. Termination board provide power and hazardous area terminal, as well as non-hazardous area connector. Each termination board can connect up to 8 AM2000EX interface module.

Characteristic

- Power supply:** Independent power supply
- Channels:** 1, 2
- Function:** Transmit signal isolatedly, Transmission conversion Distribution
- Signal match and intrinsically safe instruments:**
 - Switch, Proximity detector input
 - 2-wire/3-wire transmitter input(including HART)
 - Current signal input/output
 - TC, mV, RTD input

Standards and Certificates

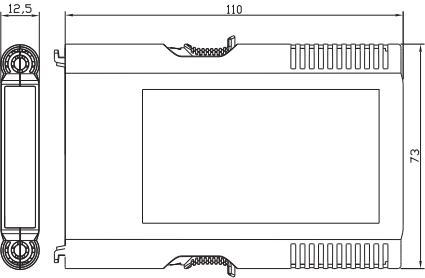
- Standards:**
 - GB 3836.1-2010
 - GB 3836.4-2010
 - GB 3836.20-2010
 - GB/T 19001-2008 identical to ISO 9001:2008
- Certificates:**
 - National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation(NEPSI)
 - AM2000EX series isolated barrier
 - AM2000EX series termination board
 - Certificate Number: GYB12.1279X

General Technical Parameters

- Power supply protection:** Reverse Protection
- Safety isolation:** Isolated safety voltage of 250V AC between safe area and hazardous area
- Dielectric strength:** 2500V AC; 1min (Between intrinsically safe part and non-intrinsically safe part)
- EMC:**
 - According to GB/T 18268 (IEC 61326-1)
 - ESD: Air Discharge 8kV
 - EFT/Burst: Power ports 2kV, I/O signal ports 1kV
 - Surge: Line to Ground 2kV, Line to Line 1kV
 - Electromagnetic Field: 10V/m
- Operation conditions:**
 - The air should not contain any medium corrupting the coat of chrome, nickel and silver. Moreover, violent quiver and impact or any cause of electromagnetic induction (such as big current or spark, etc.) must be avoided when using.
 - Ambient temperature: -20℃ ~ +60℃
 - Relative humidity: 10% ~ 90%
- Storage conditions:**
 - Temperature: -40℃ ~ +80℃
 - Relative humidity: 10% ~ 90%

Structure and Dimensions

- Structure:** AM2000 series plastic-case structure
- Installation:** Mounting on termination board in safe area
- Dimensions:** 110.0mm × 73.0mm × 12.5mm



AM2000EX Series Isolated Barrier

Field instruments	Type	Model	Channels	Hazardous area	Non-Hazardous area	Feature	Page
	DI	AM2012EX	2	Switch/Proximity detector Input	Relay Output	LFD	11
	AI	AM2031EX	1	2-wire/3-wire transmitter Current source Input	4 ~ 20mA HART	Independent power supply	12
	AO	AM2041EX	1	4 ~ 20mA HART	4 ~ 20mA Input	Independent power supply	13
	TC	AM2051EX	1	TC/mV Input	4 ~ 20mA Output	Programmable Independent power supply	14
	RTD	AM2061EX	1	RTD Input	4 ~ 20mA Output	Programmable Independent power supply	15

2 inputs 2 outputs: AM2012EX

AM2012EX digital input, relay output isolated barrier, transfer switches or proximity detectors from hazardous area to safe area. Switches are provided to select phase reversal and to enabled the line fault detection. The product needs an independent power supply.

Specification

Hazardous area input	
Input signal	Switch, proximity detector
Open circuit voltage	≈8V (open circuit)
Short circuit current	≈8mA
Safe area output	
Response time	≤10ms
Drive ability	250V AC, 2A or 30V AC, 2A
Input and output characteristics (Normal phase)	If input >2.1mA, output relay is energized, with yellow LED ON If input <1.2mA, output relay is de-energized, with yellow LED OFF Operate K1 (ch1) K3 (ch2), input and output reverse when ON, in phase when OFF
Phase reversal	Operate K2 (ch1) K4 (ch2), ON with LFD function, OFF without LFD function
LFD function	Switch input (I), K2, K4 should be set OFF, no LFD (breakage, short circuit); If need LFD (breakage, short circuit), 22kΩ in parallel with switch, 680Ω in series with switch, see switch (II), K2, K4 be set ON.
General parameter	
Supply voltage	20~35VDC
Current consumption	≤45mA (24V supply, output energized)
Dielectric strength	Between intrinsically safe part and non-intrinsically safe part ≥2500V AC Between power supply part and non-intrinsically safe part ≥500V AC
EMC	
Ambient temperature	GB/T 18268 (IEC 61326-1)
Suitable IS apparatus	-20℃ ~ +60℃
Suitable location	Switch or DIN 19234 standard NAMUR proximity detector input field devices (including intrinsically safe type pressure switch, temperature switch and liquid level switch); Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (Um): 250V

Intrinsic safety parameter:

Terminals (between 1, 3), (between 2, 4)

U₀=10.5V, I₀=14mA, P₀=37mW

II C: C₀=2.4μF, L₀=165mH

II B: C₀=16.8μF, L₀=495mH

II A: C₀=75.0μF, L₀=1000mH

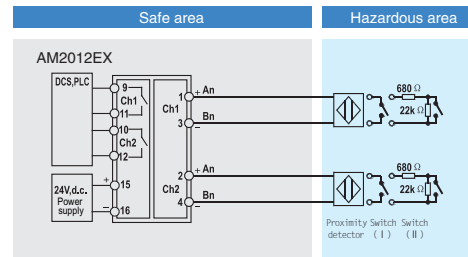
Structure and Dimensions

Structure: AM2000 series plastic-case structure

Installation: Mounting on termination board in safe area, pluggable



Application



1 input 1 output: AM2031EX

AM2031EX 2-wire/3-wire intelligent transmitter (HART), current source input isolated barrier, provide isolated power for transmitter in hazardous area, transfer 4~20mA signal (or current source signal) generated by transmitter from hazardous area to safe area into 4~20mA DC output, also allows bi-directional transmission of HART. The product should be supplied power independently. Input, output and power are each galvanically isolated.

Specification

Hazardous area input	
Input signal	4~20mA, HART
Open circuit voltage	≤28V
Distribution voltage at 20mA output	≥16V
Safe area output	
Current output	4~20mA, HART
Load resistance	RL ≤ 450Ω
Load resistance with HART	RL ≥ 249Ω
Response time	Reach 90% of final value in 3ms
General parameter	
Supply voltage	20~35VDC
Current consumption	≤60mA (24V supply, 20mA output)
Transfer accuracy (20℃, 4~20mA)	0.1%F.S. (Typical); 0.05%F.S.)
Temperature drift (-20℃~+60℃)	0.01%F.S./℃
Dielectric strength	Between intrinsically safe part and non-intrinsically safe part ≥ 2500V AC Between power supply part and non-intrinsically safe part ≥ 500V AC
EMC	
Ambient temperature	GB/T 18268 (IEC 61326-1)
Suitable IS apparatus	-20℃ ~ +60℃
Suitable location	2-wire/3-wire intelligent (HART) transmitter, current source Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (Um): 250V

Intrinsic safety parameter:

Terminals (Among 1, 2, 3, 4)

U₀=28V, I₀=93mA, P₀=651mW

II C: C₀=0.083μF, L₀=4.2mH

II B: C₀=0.65μF, L₀=12.6mH

II A: C₀=2.15μF, L₀=33.6mH

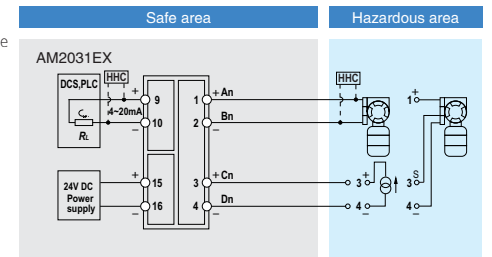
Structure and Dimensions

Structure: AM2000 series plastic-case structure

Installation: Mounting on termination board in safe area, pluggable



Application



1 input 1 output: AM2041EX

AM2041EX Operation side isolated barrier, accepts 4~20mA signal from safe area to drive executive mechanisms in hazardous area, also allows bidirectional transmission of HART communication signals. The product should be supplied power independently. Input, output and power are each galvanically isolated.

Specification

Hazardous area output	
Current output	4 ~ 20mA DC, HART
Load resistance	$RL \leq 800 \Omega$
Load resistance with HART	$RL \geq 249 \Omega$
Safe area input	
Input signal	4 ~ 20mA DC, HART
Voltage drop	$\leq 2V$
Response time	Reach 90% of final value in 0.5ms
General parameter	
Supply voltage	20 ~ 35V DC
Current consumption	$\leq 45mA$ (24V supply, 20mA output)
Transfer accuracy (20°C, 4~20mA)	0.1%F.S. (Typical: 0.05%F.S.)
Temperature drift (-20°C ~ +60°C)	0.01%F.S./°C
Dielectric strength	Between intrinsically safe part and non-intrinsically safe part $\geq 2500V$ AC Between power supply part and non-intrinsically safe part $\geq 500V$ AC
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20°C ~ +60°C
Suitable IS apparatus	2-wire valve positioner, electric converter
Suitable location	Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (U_m) : 250V

Intrinsic safety parameter:

Terminals (between 1、2)

II C: $C_0=0.083\mu F$, $L_0=4.2mH$

II B: $C_0=0.65\mu F$, $L_0=12.6mH$

II A: $C_0=2.15\mu F$, $L_0=33.6mH$

1 input 1 output: AM2051EX

AM2051EX TC input isolated barrier, converts thermal couple signal in hazardous area into 4~20mA signal. It is intelligent and has cold junction compensation function, TC graduation number and range can be configured through computer. The product should be supplied power independently. Input, output and power are each galvanically isolated.

Specification

Hazardous area input	
Input signal	See table 1 in P1 (Signal type and range should be specified when ordering or self configuring) /mV signal need to be customized
Safe area output	
Current output	4 ~ 20mA DC
Load resistance	$RL \leq 550 \Omega$
Response time	$\leq 1s$
Alarm indication	
Lower than lower limit	LED L flashing, output about 3.8mA
Higher than upper limit	LED H flashing, output about 20.8mA
Breakage alarm	LED L and H flashing at the same time, output about 20.8mA
General parameter	
Supply voltage	20 ~ 35V DC
Current consumption	$\leq 40mA$ (24V supply, 20mA output)
Transfer accuracy (Measure under 5°C)	See table 1 in P1
Cold junction compensation	1°C in full range (Compensation range: -20 ~ +60°C)
Temperature drift (-20°C ~ +60°C)	0.01%F.S./°C
Dielectric strength	Between intrinsically safe part and non-intrinsically safe part $\geq 2500V$ AC Between power supply part and non-intrinsically safe part $\geq 500V$ AC
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20°C ~ +60°C
Suitable IS apparatus	TC including T, E, J, K, N, R, S, B
Suitable location	Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (U_m) : 250V

Intrinsic safety parameter:

Terminals (between 1、2)

II C: $C_0=6.5\mu F$, $L_0=3.6mH$

II B: $C_0=60\mu F$, $L_0=10.8mH$

II A: $C_0=1000\mu F$, $L_0=28.8mH$

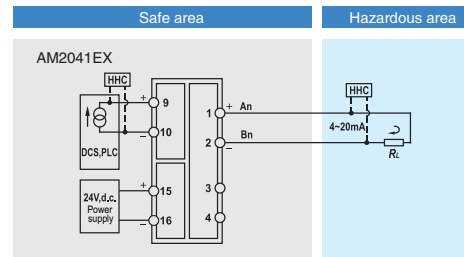
Structure and Dimensions

Structure: AM2000 series plastic-case structure

Installation: Mounting on termination board in safe area, pluggable



Application



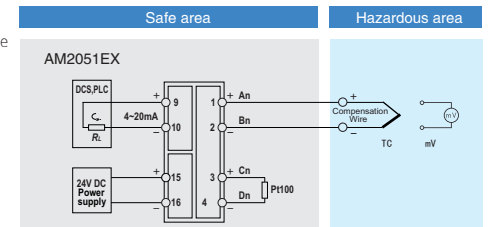
Structure and Dimensions

Structure: AM2000 series plastic-case structure

Installation: Mounting on termination board in safe area, pluggable



Application



RTD (Programmable)

1 input 1 output: AM2061EX

AM2061EX RTD input isolated barrier, convert 2-wire/3-wire RTD signal in hazardous area into 4~20mA signal, graduation number and range of RTD can be configured through PC, as well as upper/lower limit and breakage alarm output current. The product should be supplied power independently. Input, output and power are each galvanically isolated.

Specification

Hazardous area input	See table 1 in P1(Signal type and range should be specified when ordering or self configuring)
Input signal	
Safe area output	4 ~ 20mA DC
Current output	≤550Ω
Load resistance	Reach 90% of final value in 1s
Response time	
Alarm indication	
Lower than lower limit	LED L flashing, output about 3.8mA
Higher than upper limit	LED H flashing, output about 20.8mA
Breakage alarm	LED L and H flashing at the same time, output about 20.8mA
Short circuit alarm	LED L and H flashing at the same time, output about 3mA
General parameter	
Supply voltage	20 ~ 35V DC
Current consumption	≤40mA (24V supply, 20mA output)
Transfer accuracy (Measure under 25℃)	See table 1 in P1
Temperature drift	0.01%F.S./℃
Dielectric strength	Between intrinsically safe part and non-intrinsically safe part≥2500V AC Between power supply part and non-intrinsically safe part≥500V AC
EMC	
Ambient temperature	-20℃ ~ +60℃
Suitable IS apparatus	2-wire/3-wire RTD
Suitable location	Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Structure and Dimensions

Structure: AM2000 series plastic-case structure

Installation: Mounting on termination board in safe area, pluggable



Certificate

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation(NEPSI)

Ex-marking: [Ex ia Ga] II C

Maximum voltage (Um) : 250V

Intrinsic safety parameter:

Terminals (Among 1、 2、 3)

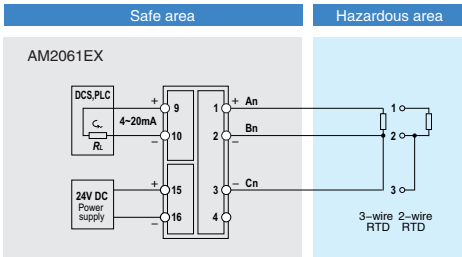
II C: $U_0=8.5V$, $I_0=20mA$, $P_0=43mW$

II C: $C_0=6.5\mu F$, $L_0=3.6mH$

II B: $C_0=60\mu F$, $L_0=10.8mH$

II A: $C_0=1000\mu F$, $L_0=28.8mH$

Application



Notes: 1. 3-wire RTD input, ensure resistance of 3 wire equal as far as possible;
2. 2-wire RTD input, terminals 2 & 3 must be shorted.

K-AM200 series termination board

K-AM200 series termination board

K-AM200 series are termination board of isolated barriers. Intrinsically safe part connect field signal through terminals, non-intrinsically safe part connect K series DCS system through Db37 connector. The board used in concert with AM2000EX series isolated barriers, the board itself are without isolated barriers. At the same time, the board can also be used in concert with FM series DCS module, configure FM1381 to transfer when using.

Products list

Type	Corresponding IS Type	Output signal	Channels	Corresponding IS model	Matching wire type
K-AM201	AI AO RTD Input	Current	8	AM2031EX AM2041EX AM2061EX	DB37
K-AM202	AI RTD Input	Voltage	8	AM2031EX AM2061EX	DB37
K-AM203	TC Input	Current	8	AM2051EX	DB37
K-AM204	TC Input	Voltage	8	AM2051EX	DB37
K-AM205	DI	Relay	16	AM2012EX	DB37

Note: Each board need install the same model of isolated barrier, use Am2000k to fill if less than 8.

AI/AO/RTD input, current output termination board

K-AM201

K-AM201 is 8-channel analog/RTD isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects K series DCS through DB37 connector. Can be 8-channel AI/AO/RTD input, 8-channel current signal.

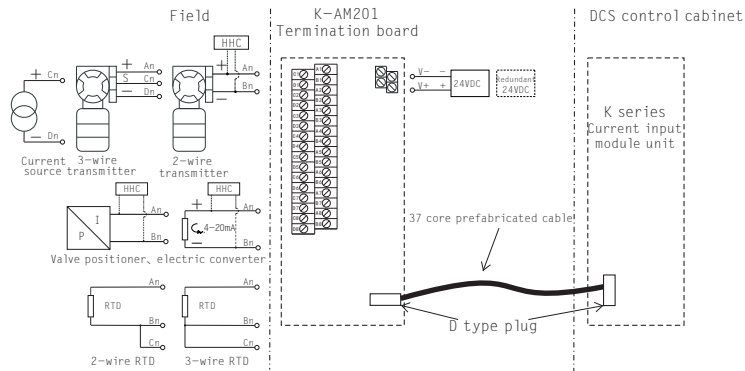
The board used in concert with AM2031EX, AM2041EX or AM2061EX isolated barriers, each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers.

The board can also be used in concert with FM series DCS module, configure FM1381 to transfer when using.

Specification

Signal type:	AI/AO/RTD input
Supply voltage:	20~35V DC
Power consumption(max):	<440mA@24V
Max. reference error:	≤0.1%FS (typical 0.05%FS)
Temperature drift:	<100ppm/K (typical 50ppm/K)
Ambient temperature:	-20℃~+60℃
Relative humidity:	10%~90%, Tu=40℃, no condensate
Storage temperature:	-40℃~+85℃

Application



Structure and Dimensions

Dimension: 47.0mm × 150.0mm × 109.0mm

Installation: Cage rail installation

Weight(no boxing) : ≤500g



AI/RTD input, voltage output termination board

K-AM202

K-AM202 is 8-channel analog/RTD isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects K series DCS through DB37 connector. Can be 8-channel AI/AO/RTD input, 8-channel voltage signal.

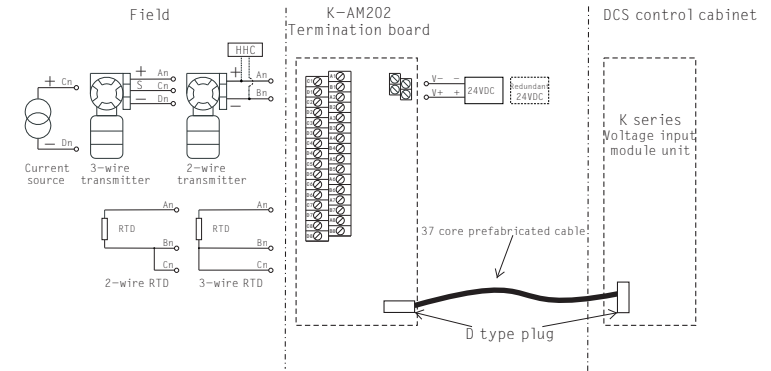
The board used in concert with AM2031EX or AM2061EX isolated barriers, each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers.

The board can also be used in concert with FM series DCS module, configure FM1381 to transfer when using.

Specification

Signal type:	AI/RTD input
Supply voltage:	20~35V DC
Power consumption(max):	<440mA@24V
Max. reference error:	≤0.1%FS (typical 0.05%FS)
Temperature drift:	<100ppm/K (typical 50ppm/K)
Ambient temperature:	-20℃~+60℃
Relative humidity:	10%~90%, Tu=40℃, no condensate
Storage temperature:	-40℃~+85℃

Application



Structure and Dimensions

Dimension: 47.0mm × 150.0mm × 109.0mm

Installation: Cage rail installation

Weight(no boxing) : ≤500g



TC input, current output termination board

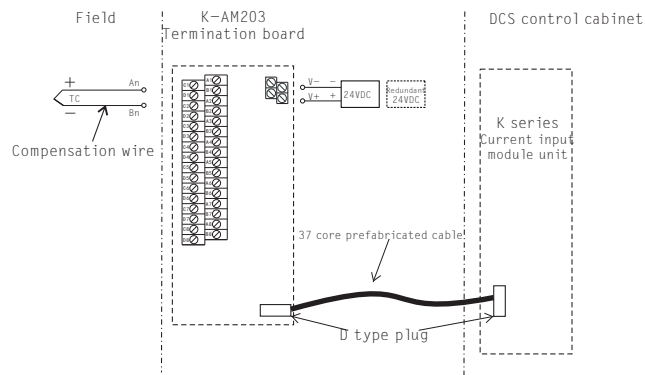
K-AM203

K-AM203 is 8-channel TC isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects K series DCS through DB37 connector. Can be 8-channel TC input, 8-channel current signal. The board used in concert with AM2051EX isolated barriers, each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers. The board can also be used in concert with FM series DCS module, configure FM1381 to transfer when using.

Specification

Signal type:	TC input
Supply voltage:	20~35V DC
Power consumption(max):	<440mA@24V
Max. reference error:	≤0.1%FS (typical 0.05%FS)
Temperature drift:	<100ppm/K (typical 50ppm/K)
Ambient temperature:	-20℃~+60℃
Relative humidity:	10%~90%, Tu=40℃, no condensate
Storage temperature:	-40℃~+85℃

Application



Structure and Dimensions

Dimension: 47.0mm × 150.0mm × 109.0mm

Installation: Cage rail installation

Weight(no boxing) : ≤500g



TC input, voltage output termination board

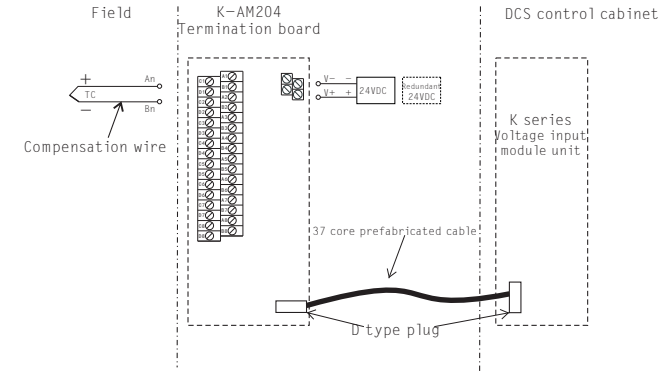
K-AM204

K-AM204 is 8-channel TC isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects K series DCS through DB37 connector. Can be 8-channel TC input, 8-channel voltage signal. The board used in concert with AM2051EX isolated barriers, each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers. The board can also be used in concert with FM series DCS module, configure FM1381 to transfer when using.

Specification

Signal type:	TC input
Supply voltage:	20~35V DC
Power consumption(max):	<440mA@24V
Max. reference error:	≤0.1%FS (typical 0.05%FS)
Temperature drift:	<100ppm/K (typical 50ppm/K)
Ambient temperature:	-20℃~+60℃
Relative humidity:	10%~90%, Tu=40℃, no condensate
Storage temperature:	-40℃~+85℃

Application



Structure and Dimensions

Dimension: 47.0mm × 150.0mm × 109.0mm

Installation: Cage rail installation

Weight(no boxing) : ≤500g

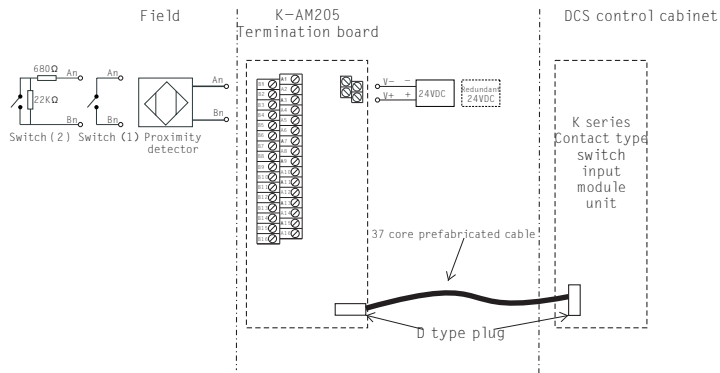


DI, relay output termination board

K-AM205

K-AM205 is 16-channel digital isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects K series DCS through DB37 connector. Can be 16-channel switch input, 16-channel relay signal output. Output channel isolated from each other. The board used in concert with AM2012EX isolated barriers, each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers. The board can also be used in concert with FM series DCS module, configure FM1381 to transfer when using.

Application



Structure and Dimensions

Dimension: 47,0mm × 150,0mm × 109,0mm
Installation: Cage rail installation
Weight(no boxing) : ≤500g



Specification

Signal type: DI
Supply voltage: 20~35V DC
Power consumption(max): <440mA@24V
Max. reference error: ≤0.1%FS (typical 0.05%FS)
Temperature drift: <100ppm/K (typical 50ppm/K)
Ambient temperature: -20℃~+60℃
Relative humidity: 10%~90%, Tu=40℃, no condensate
Storage temperature: -40℃~+85℃

SM-AM200 series termination board

SM-AM200 series termination board

SM-AM200 series are termination board of isolated barriers. Intrinsically safe part connect field signal through terminals, non-intrinsically safe part connect SM series DCS system through DB25 connector. The board used in concert with AM2000EX series isolated barriers, the board itself are without isolated barriers.

Products list

Type	Corresponding IS Type	Output signal	Channels	Corresponding IS model	Matching wire type
SM-AM201	AI AO RTD Input	Current	8	AM2031EX AM2041EX AM2061EX	DB25
SM-AM202	AI RTD Input	Voltage	8	AM2031EX AM2061EX	DB25
SM-AM203	TC Input	Current	8	AM2051EX	DB25
SM-AM204	TC Input	Voltage	8	AM2051EX	DB25
SM-AM205	DI	Relay	16	AM2012EX	DB25

Note: Each board need install the same model of isolated barrier, use Am2000k to fill if less than 8.

AI/AO/RTD input, current output termination board

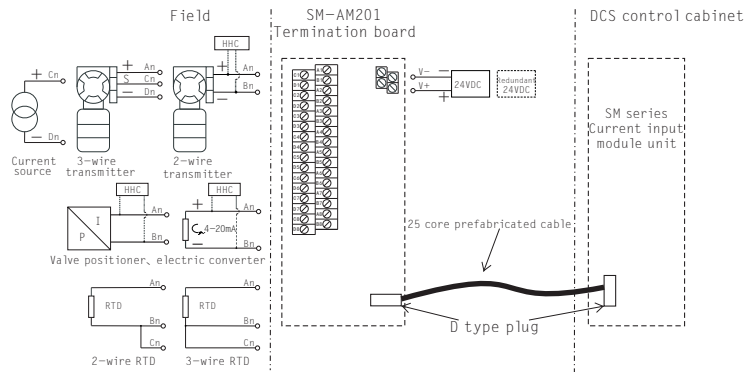
SM-AM201

SM-AM201 is general isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects SM series DCS through DB25 connector. Can be 8-channel analog signal output. When need AI/AO, the board used in concert with AM2031EX or AM2041EX; when need RTD input, Analog output, the board used in concert with AM2061EX; when need digital input, the board used in concert with AM2012EX. Each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers.

Specification

Signal type: AI/AO/RTD input
Supply voltage: 20~35V DC
Power consumption(max): <440mA@24V
Max. reference error: ≤0.1%FS (typical 0.05%FS)
Temperature drift: <100ppm/K (typical 50ppm/K)
Ambient temperature: -20℃~+60℃
Relative humidity: 10%~90%, Tu=40℃, no condensate
Storage temperature: -40℃~+85℃

Application



Structure and Dimensions

Dimension: 47.0mm × 150.0mm × 109.0mm

Installation: Cage rail installation

Weight(no boxing) : ≤500g



AI/RTD input, voltage output termination board

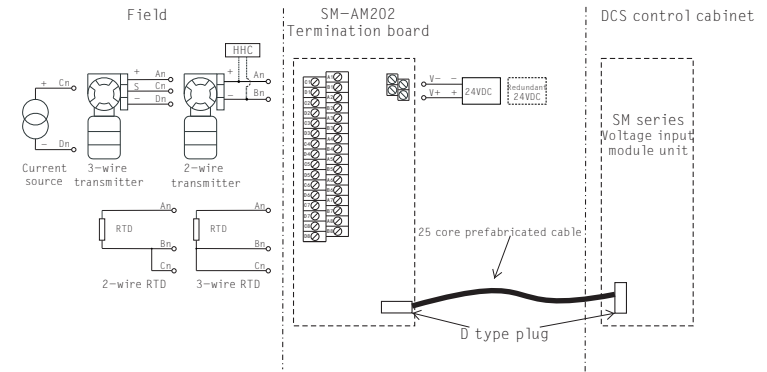
SM-AM202

SM-AM202 is general isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects SM series DCS through DB25 connector. Can output 8-channel analog signal. When need AI, the board used in concert with AM2031EX; when need RTD input, the board used in concert with AM2061EX. Each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers.

Specification

Signal type: AI/RTD input
Supply voltage: 20~35V DC
Power consumption(max): <440mA@24V
Max. reference error: ≤0.1%FS (typical 0.05%FS)
Temperature drift: <100ppm/K (typical 50ppm/K)
Ambient temperature: -20℃~+60℃
Relative humidity: 10%~90%, Tu=40℃, no condensate
Storage temperature: -40℃~+85℃

Application

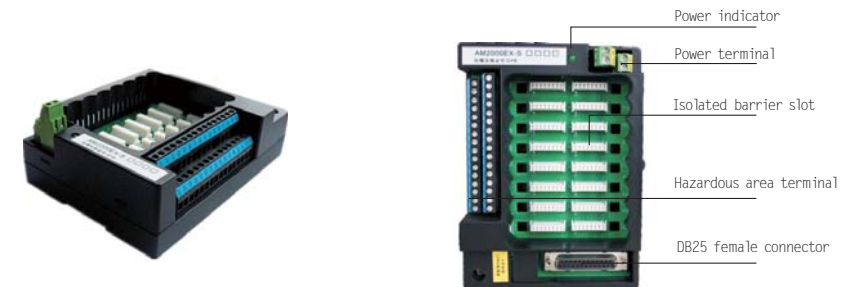


Structure and Dimensions

Dimension: 47.0mm × 150.0mm × 109.0mm

Installation: Cage rail installation

Weight(no boxing) : ≤500g



TC input, current output termination board

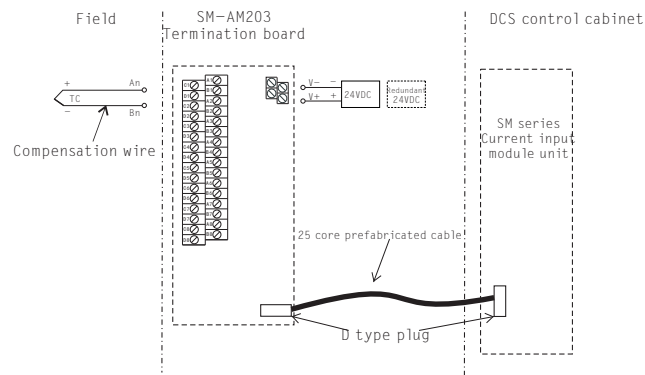
SM-AM203

SM-AM203 is TC(thermocouple) isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects SM series DCS through DB25 connector. Can input 8-channel TC signal and output 8-channel 4~20mA current signal. The board used in concert with AM2051EX. Each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers.

Specification

Signal type: TC input
Supply voltage: 20~35V DC
Power consumption(max): <440mA@24V
Max. reference error: ≤0.1%FS (typical 0.05%FS)
Temperature drift: <100ppm/K (typical 50ppm/K)
Ambient temperature: -20℃~+60℃
Relative humidity: 10%~90%, Tu=40℃, no condensate
Storage temperature: -40℃~+85℃

Application



Structure and Dimensions

Dimension: 47.0mm × 150.0mm × 109.0mm

Installation: Cage rail installation

Weight(no boxing) : ≤500g



TC input, voltage output termination board

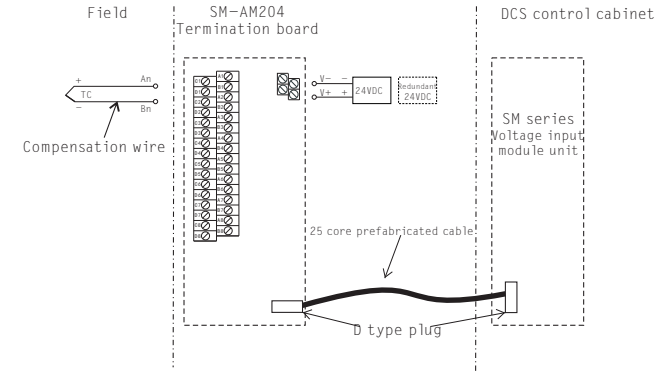
SM-AM204

SM-AM204 is TC(thermocouple) isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects SM series DCS through DB25 connector. Can input 8-channel TC signal and output 8-channel 1~5V voltage signal. The board used in concert with AM2051EX. Each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers.

Specification

Signal type: TC input
Supply voltage: 20~35V DC
Power consumption(max): <440mA@24V
Max. reference error: ≤0.1%FS (typical 0.05%FS)
Temperature drift: <100ppm/K (typical 50ppm/K)
Ambient temperature: -20℃~+60℃
Relative humidity: 10%~90%, Tu=40℃, no condensate
Storage temperature: -40℃~+85℃

Application

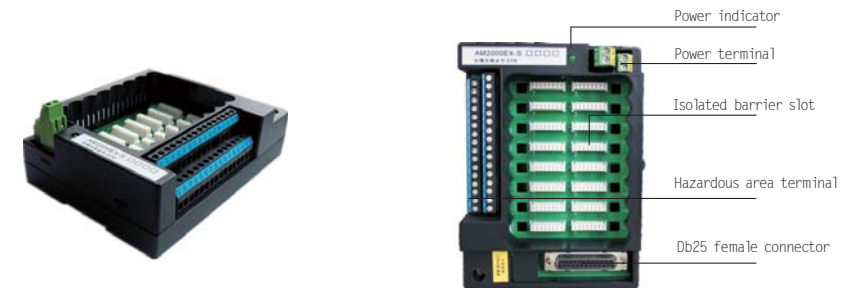


Structure and Dimensions

Dimension: 47.0mm × 150.0mm × 109.0mm

Installation: Cage rail installation

Weight(no boxing) : ≤500g



DI input, current output termination board

SM-AM205

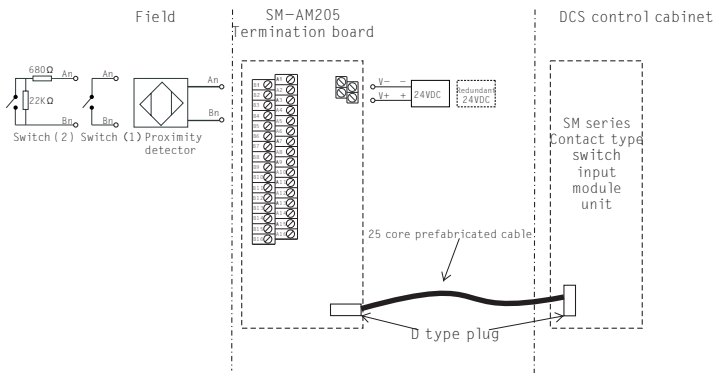
SM-AM205 is 16-channel digital isolated barrier termination board module. Intrinsically safe part connects field signal through Phoenix terminal, non-intrinsically safe part connects SM series DCS through DB25 connector. Can input 16-channel switch signal and output 16-channel relay signal, output channels are each isolated.

The board used in concert with AM2012EX. Each module can only be configured with same type of isolated barrier. The board itself are without isolated barriers.

Specification

Signal type: DI input
Supply voltage: 20~35V DC
Power consumption(max): <440mA@24V
Max. reference error: ≤0.1%FS (typical 0.05%FS)
Temperature drift: <100ppm/K (typical 50ppm/K)
Ambient temperature: -20℃~+60℃
Relative humidity: 10%~90%, Tu=40℃, no condensate
Storage temperature: -40℃~+85℃

Application



Structure and Dimensions

Dimension: 47.0mm × 150.0mm × 109.0mm

Installation: Cage rail installation

Weight(no boxing) : ≤500g



Accessories

1. Cable

Type	DB37	DB25
Summarize	Used in concert with K-AM200 series board, dedicated cable connect to K series DCS system	Used in concert with SM-AM200 series board, dedicated cable connect to SM series DCS system
Specification	37 core female connector	25 core male connector
Length	0.7~10米	0.7~10米
Picture		
Terminal section		

2. Protective parts

AM2000K is a matching accessory of AM2000EX series isolated barrier. It is an empty shell without any components used to prevent metal foreign objects into the board which will cause intrinsically safety failure. Use AM2000K to fill when isolated barriers on board are less than 8.



Intrinsically safe explosion-proof technology

The most common types of EX-proof protection in industrial automation control are:
Ex-i, Ex-d and Ex-e.

Ex-i is the only type that can be used in zone 0.

Basic principle of intrinsic safety “i”

Type of protection based on the restriction of electrical energy within equipment and of interconnecting wiring exposed to the explosive atmosphere to a level below that which can cause ignition by either sparking or heating effects. Call this type of electrical equipment intrinsically safe apparatus.

Characters of intrinsically safe explosion-proof technology Ex marking for intrinsically safe apparatus

Intrinsically safe apparatus with simple structure, small volume and light weight; Can live maintain, calibrate and replace components; Not reduce the safety and reliability of electrical equipment because of external structure damage; It is a “weak electricity” technology, applications in field will not cause accidents like electric shock and other accidents; The only EX-proof protection type can be used in zone 0; Simple apparatus(RTD, TC, etc.) can access the intrinsically safe explosion-proof circuit system without certification especially.

Level of protection “ia” , “ib”

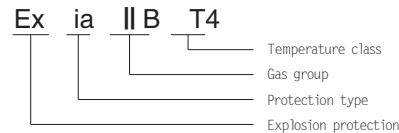
Intrinsically safe apparatus and intrinsically safe parts of associated apparatus shall be placed in Levels of protection “ia”, “ib” Level “ia” shall not be capable of causing ignition in normal operation and with the application of one countable faults and two countable faults plus those non-countable faults which give the most onerous condition. Intrinsic safety “ia” can be used in Zone 0/1/2 hazardous area. Level “ib” shall not be capable of causing ignition in normal operation and with the application of one countable faults. Intrinsic safety “ib” can be used in Zone 1/2 hazardous area.

Temperature class of electrical equipment

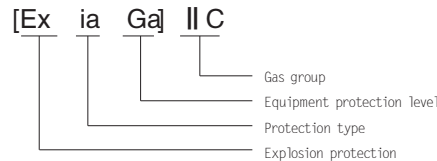
Temperature class of electrical equipment specifies the max. surface temperature of equipment. Temperature class of electrical equipment shall be lower than ignition temperature of flammable substances in hazardous area otherwise it may cause combustion and explosion.

Classification of max. surface temperatures

Max. surface temperature(°C)	450	300	200	135	100	85
Temperature class	T1	T2	T3	T4	T5	T6



Ex marking for associated apparatus (isolated barrier)



Certification standards and bodies

Certification standards

GB3836.1-2010 (equivalent IEC 60079-0-2007.MOD) is issued at 2010-08-09, implemented at 2011-08-01.
GB 3836.4-2010 (equivalent IEC 60079-11: 2006.MOD) is issued at 2010-08-09, implemented at 2011-08-01, replace the former GB3836-2000.

Certification bodies and symbols

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI). It is the body in charge of safety supervision and inspection of domestic and imported instruments EX-proof products. It also gained the mutual recognition of EX-proof certification technology with foreign certification bodies like FMRC, PTB. (See www.nepsi.com)



Certificate markings of foreign certification bodies

European



United States

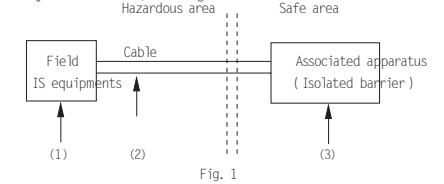


Canada



Basic structure of intrinsically safe circuit system

Intrinsically safe circuit system is intrinsically safe EX-plosion proof system in short, see Fig.1



Intrinsically safe electrical equipments in field

Simple apparatus and intrinsically safe apparatus.

Simple apparatus

According to the technology conditions of manufactures, electrical equipments which electrical parameters are under 1.2V, <0.1A, <25mW, <20μJ, no need EX-proof certification. Can be freely arranged in intrinsically safe circuit.
For example: Resistance(including variable resistance), LED, switch, TC, RTD, strain gauge.

Intrinsically safe apparatus

Intrinsically safe electrical equipments with energy storage components, need EX-proof certification. Like transmitters, proximity detectors and so on.

Certification parameters of intrinsically safe performance of IS equipments

Intrinsically safe performance parameters of IS equipments are given when EX-proof certification, parameters definition as below: Max. input voltage(U): Max. voltage(peak a.c. or d.c.) that can be applied to the connection facilities of apparatus without invalidating the type of protection.

Max. input current(I_i): Max. current(peak a.c. or d.c.) that can be applied to the connection facilities of apparatus without invalidating the type of protection.

Max. input power(P_i): Max. power that can be applied to the connection facilities of apparatus without invalidating the type of protection.

Max. internal capacitance(C_i): Max. equivalent internal capacitance of the apparatus which is considered as appearing across the connection facilities.

Max. internal inductance(L_i): Max. equivalent internal inductance of the apparatus which is considered as appearing at the connection facilities.

Associated apparatus (isolated barriers)

Electrical equipment which contains both intrinsically safe circuits and non-intrinsically safe circuits and is constructed so that the non-intrinsically safe circuits cannot adversely affect the intrinsically safe circuits.

Intrinsically safe performance certification parameters of isolated barriers

Intrinsically safe performance parameters of isolated barriers are given when EX-proof certification, parameters definition as below: Max. r.m.s a.c. or d.c. voltage (Um): Max. voltage that can be applied to the non-intrinsically safe connection facilities of associated apparatus without invalidating the type of protection.

Max. output voltage(Uo): Max. voltage(peak a.c. or d.c.) that can appear at the connection facilities of the apparatus at any applied voltage up to the max. voltage.

Max. output current(Io): Max. current(peak a.c. or d.c.) in apparatus that can be taken from the connection facilities of the apparatus.

Max. output power(Po): Max. electrical power that can be taken from the apparatus.

Max. external capacitance(Co): Max. capacitance that can be connected to the connection facilities of the apparatus without invalidating the type of protection.

Max. external inductance(Lo): Max. value of inductance that can be connected to the connection facilities of the apparatus without invalidating the type of protection.

Connection cable

The connection cable has distributed capacitance and distributed inductance, making the connection cable an energy storage component.

Basic parameters of its intrinsically safe performance shown as below

Max. allowable distributed capacitance of cable $C_c=C_k \times L$

Max. allowable distributed inductance of cable $L_c=L_k \times L$

Where C_k — Distributed capacitance of cable per unit length;

L_k — Distributed inductance of cable per unit length;

L — Actual distribution length.

General cable parameters that comply with intrinsically safe performance

$C_k = 0.1154 \mu F/km$

$L_k = 0.20mH/km$

Intrinsically safe circuit system parameters EX-proof certification

In order to ensure normal safe use of equipments, intrinsically safe circuit system configuration must meet the following conditions.

1、Ex marking level of intrinsically safe electrical equipments shall not be higher than level of isolated barriers.

2、Certification parameters among associated apparatus, intrinsically safe electrical equipment and connection cable shall meet the following inequality:

Isolated barrier parameters	Safety parameter matching conditions	IS Instrument parameter + cable parameter
U_o	\leq	U_i
I_o	\leq	I_i
P_o	\leq	P_i
C_o	\geq	C_i+C_c
L_o	\geq	L_i+L_c

Safety barriers

Safety barriers included Zener barriers and isolated barriers.

Zener barrier

Zener barriers achieve energy limiting by adopting fast fuse and current limiting resistor in series and zener diode in parallel in circuit, ensure safety limiting when connecting instrument signal between hazardous area and safe area, see Fig.2 It adopts very few components, is small and cheap, but also has some fatal weakness so that restricts application hardly. It presented downward trend in current.

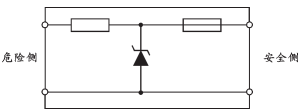


Fig. 2

Application notice in using zener barrier

- 1、The factory must has special intrinsically safe grounding system and the grounding resistor must be less than 1Ω when using zener barrier.
- 2、Intrinsically safety instrument in field must be isolated type when using zener barrier. Non-isolated type instrument can not be used.
- 3、Using zener barrier is greatly affected by power supply, the supply voltage fluctuation may lead current leakage of zener diode, that results in signal error or mistake level, seriously the fast fuse will break and be damaged forever. According to the regulations, zener barrier's internal zener diode, current limiting resistor and fuse are encapsulated as a whole, cannot be repaired once damaged.
- 4、Using zener barrier, negative signal must be connected to intrinsically safe grounding, which greatly reduce signal anti-interference ability of system, affect reliability of system, especially the DCS system.

Isolated barrier

Isolated barrier not only has energy limiting function but also has isolation function. It is mainly composed of circuit limiting module, signal and power isolation module and signal processing module. The basic function diagram see Fig.3

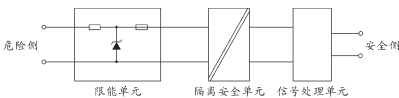


Fig. 3

Advantages of isolated barrier application

- 1、Compared with zener barrier, although isolated barrier is more expensive, it has many advantages and features, and brings a lot convenience to users, more and more users prefer to choose isolated barrier.
- 2、Using isolated barrier can effectively isolate circuit signal between hazardous area and safe area. Intrinsically safe system does not require intrinsically safe grounding which simplifies the construction of intrinsically safe EX-proof system application.
- 3、Using isolated barrier can greatly enhance anti-interference ability of detection and control loop, improve system reliability.
- 4、Using isolated barrier, field instrument grounding is allowable, field instrument can be non-isolated type.
- 5、Isolated barrier has many protection function circuit, is not likely to accidental damage, live maintenance of field instrument is allowable, which can shorten preparing time of power on and reduce shut down time.
- 6、Isolated barrier has strong signal processing capability. Such as digital input state control, mV、Pt100 transfer into $4 \sim 20mA$ and so on. Provide field instrument and control system a reasonable, effective and convenient solution.
- 7、When user apply DCS and ESD at the same time, choose isolated barrier with 1 input and 2 outputs can effectively isolate the two system, avoid interaction between systems.
- 8、Loop powered isolated barrier maintain the advantages of active isolated barrier, also easy to wire as zener barrier, no need another 24V power supply, which is especially suitable for DCS system powered by I/O card directly.

General requirements of intrinsically safe circuit system design

Selection principle of intrinsically safe electric equipment

Simple apparatus

According to standard GB 3836.4-2000, electrical equipment which voltage not over 1.2V, current not over 0.1A, energy not over $20\mu\text{J}$ or power not over 25mW can be regarded as simple apparatus, the most common instruments are TC, RTD, pH electrodes, strain gauges and switches, etc. Their typical features are internal equivalent inductance $L=0$, internal equivalent inductance $C=0$.

General intrinsically safe electrical equipment:

1. Whether designed according to GB 3836.1-2010 and GB 3836.4-2010, whether has been recognized by authorized explosion-proof inspection agencies.

2. Whether the degree stipulated by EX-marking suitable for the safe requirements of hazardous area application.

3. Clear certification parameters like U_i , I_i , P_i , C_i and L_i .

4. Whether the intrinsically safe circuit grounded or the intrinsically safe circuit of grounding part has been effectively isolated with safety barrier.

5. Signal transmission in which way.

6. Max. operation voltage of intrinsically safe electrical equipment and normal operation current of circuit.

Certification standard and product certificate

1. EX-marking degree of safety barrier shall not below EX-marking degree of intrinsically safe electrical equipment.

2. Ensure the end resistance and circuit resistance of safety barrier can meet the min. operation voltage of intrinsically safe electrical equipment.

3. Intrinsically safe terminal parameters of safety barrier can meet the requirements of certificate.

4. Choose the matching safety barrier according to the polarity of power supply and signal transmission mode.

5. Avoid leakage current of safety barrier affect normal operation of field intrinsically safe equipments.

6. There are two types of safety barrier, one is zener barrier, the other is isolated barrier(difference see front page).

Selection principle of connection facilities

The connection facilities which connect intrinsically safe electrical equipment and safety barrier used in intrinsically safe system, its distribution parameters determined rationality of intrinsically safe system and using range in a certain extent. So must comply with the following conditions

1. Connection facilities' specifications

Connection facilities are copper stranded wire, cross-section area of each core is no less than 0.5mm^2

Medium strength shall be able to withstand 2 times rated voltage of intrinsically safe circuit, no less than 500V.

2. Length restriction of connection facilities

In intrinsically safe circuit system, both field intrinsically safe instruments and connection facilities are the load of safety barrier, connection facilities' length has been determined after selected safety barrier and field intrinsically safe instrument. Specific method as follow:

Calculate max. external distribution parameters of cable according to formula $C_i \leq C_0 - C_i$ and $L_i \leq L_0 - L_i$;

Calculate cable length according to formula $L = C_i/C_k$ and $L = L_i/L_k$, take the minor value as the actual wiring length L. But multi-core cable need to consider superposition effects.

3. Reference: KW cable parameters: $C_k = 0.115\mu\text{F/km}$, $L_k = 0.20\text{mH/km}$.

Wiring principle of field intrinsically safe system

1. Whole system connection must be composed with systems approved by inspection agency.

2. Be careful to prevent intrinsically safe circuit and non-intrinsically safe circuit mixed.

3. Intrinsically safe cable and non-intrinsically safe cable from control room to field are laid in their sinks, middle separated with baffle. The sink with cover to prevent external mechanical operation damage.

4. The cable lead from field junction box or sink to intrinsically safe instruments laid in the steel pipe to prevent danger caused by mechanical damage and electromagnetic induction.

5. Intrinsically safe cable and non-intrinsically safe not share the same metal pipe and the same field junction box.

6. Connection facility and its steel pipe, terminal board shall be marked blue(or wrapped in blue tape)for identification.

7. Grounding bus bar and device of zener barrier must meet the requirements of user manual and national electrical safety regulations.

8. Variety intrinsically safe circuits or associated circuits shall not share the same cable(except for cable cores shield separately)or under a same steel pipe(except for shield conductors).

AMG1000 series Ultra-thin signal isolators

AMG1000 series ultra-thin signal isolators effectively solve industrial automation control system field interference problem through infallible separation of power supply, input and output, to ensure system stability and infallible operation. 7.6mm thick, save space

Low power design, concentrated installation and long-term infallible operation
Screw connection mode

Characteristic

Power supply: Independent power supply, loop-powered

Channels: 1, 1/2

Function: Transmit signal isolatedly, signal conversion, distribute field instruments

Signal matching:

2-wire, 3-wire transmitter(including HART) input
Current signal input
TC, RTD input
Frequency signal input

General Technical Parameters

Power supply protection: Reverse Protection

Dielectric strength: 1500V AC;1min

EMC:

According to GB/T 18268 (equivalent IEC 61326-1)

ESD: Air Discharge 8kV

EFT/Burst: Power ports 2kV, I/O signal ports 1kV

Surge: Line to Ground 2kV, Line to Line 1kV

Electromagnetic Field: 10V/m

Operation conditions:

The air should not contain any medium corrupting the coat of chrome, nickel and silver. Moreover, violent quiver and impact or any cause of electromagnetic induction (such as big current or spark, etc.) must be avoided when using.

Ambient temperature: $-20^\circ\text{C} \sim +60^\circ\text{C}$

Relative humidity: 10%~90%

Storage conditions:

Temperature: $-40^\circ\text{C} \sim +80^\circ\text{C}$

Relative humidity: 10%~90%

Structure and Dimensions

Structure: Ultra-thin flame retardant plastic-case

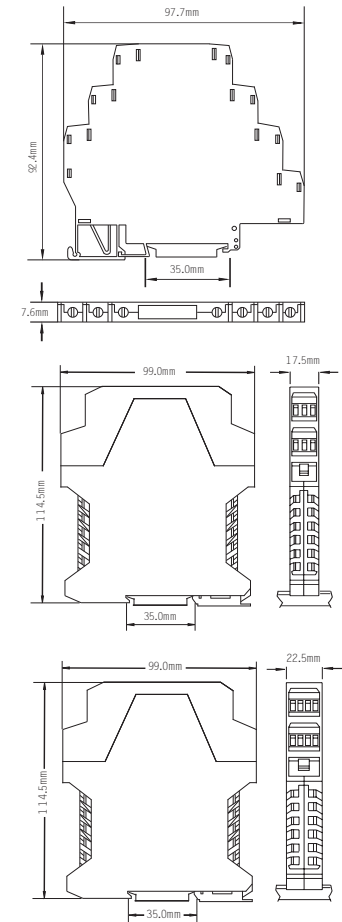
Installation: Mounting on DIN35mm guide rail

Terminals: Screw connection mode, multi or single wire of $0.5\text{mm}^2 \sim 2.5\text{mm}^2$ can be accessed.

Dimensions: $92.4\text{mm} \times 97.7\text{mm} \times 7.6\text{mm}$

$114.5\text{mm} \times 99.0\text{mm} \times 17.5\text{mm}$

$114.5\text{mm} \times 99.0\text{mm} \times 22.5\text{mm}$



AMG1000 series isolator

Field instruments	Type	Model	Channels	Input	Output	Feature	Page
	AI	AMG1031	1	2-wire/3-wire transmitter	0/4~20mA, 0/1~5V	Independent power supply	36
	Input	AMG1031H	1	Current source	0/4~20mA, 0/1~5V HART		
		AMG1032	1/2		0/4~20mA, 0/1~5V		37
	A0	AMG1041	1	4~20mA	0/4~20mA, 0/1~5V	Independent power supply	38
	Output	AMG1041H	1		0/4~20mA, 0/1~5V HART		
	RTD	AMG1051D	1	RTD, TC	0/4~20mA, 0/1~5V	Programmable	39
	TC			mV signal in common use		Independent power supply	
	mV	AMG1051H	1	RTD, TC	4~20mA	Programmable	40
	Input	Frequency AMG1055	1/2	Switch, proximity detector	4~20mA	Alarm setting and output	41
				Frequency pulse level, transistor	Alarm relay		

1 input 1 output: AMG1031

Input
Input current
Distribution voltage
Output
Output current/Load resistance
Output voltage/Load resistance
General parameter
Supply voltage
Power supply protection
Current consumption(at 24V supply, 20mA output)
Transfer accuracy (20℃, 4~20mA)
Temperature drift
Response time
Dielectric strength(Among input, output and power)
Insulation resistance(Among input, output and power)
EMC
Ambient temperature
Suitable IS apparatus

0/4 ~ 20mA
≥ 19V
0/4 ~ 20mA / R _L ≤ 550 Ω
0/1 ~ 5V / R _L ≥ 300k Ω
20 ~ 30V DC
Reverse Protection
≤ 60mA
0.1 %F.S. (Typical: 0.05 %F.S.)
0.005 %F.S./℃
Reach 90% of final value in 3ms
1500V AC;1min
≥ 100M Ω;500V DC
GB/T 18268 (IEC 61326-1)
-20℃ ~ +60℃
2-wire/3-wire transmitter, current source

1 input 1 output: AMG1031H

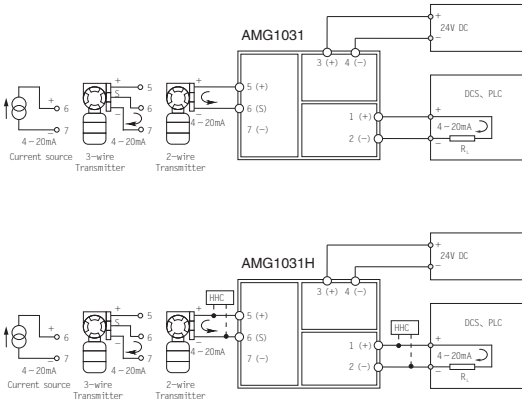
0/4 ~ 20mA (HART)
≥ 19V
0/4 ~ 20mA / R _L ≤ 550 Ω
0/4 ~ 20mA (HART) / R _L ≥ 250 Ω
0/1 ~ 5V / R _L ≥ 300k Ω
20 ~ 30V DC
Reverse Protection
≤ 60mA
0.1 %F.S. (Typical: 0.05 %F.S.)
0.005 %F.S./℃
Reach 90% of final value in 3ms
1500V AC;1min
≥ 100M Ω;500V DC
GB/T 18268 (IEC 61326-1)
-20℃ ~ +60℃
2-wire/3-wire transmitter, current source

Structure and Dimensions

AMG1031: 92.4mm×97.7mm×7.6mm
AMG1031H: 92.4mm×97.7mm×7.6mm



Application



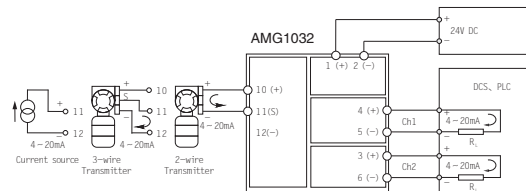
1 input 2 outputs: AMG1032

Input	
Input current	0/4 ~ 20mA
Distribution voltage	17.5 ~ 25V, current < 35mA
Output	
Output current/Load resistance	0/4 ~ 20mA / $R_L \leq 300\Omega$
Output voltage/Load resistance	0/1 ~ 5V / $R_L \geq 300k\Omega$
	0/2 ~ 10V / $R_L \geq 600k\Omega$
General parameter	
Supply voltage	20 ~ 35V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 20mA output)	$\leq 75mA$
Transfer accuracy (20℃, 4~20mA)	0.1%F.S. (Typical: 0.05%F.S.)
Temperature drift	0.005%F.S./℃
Response time	Reach 90% of final value in 2ms
Dielectric strength(Among input, output and power)	1500V AC;1min
Insulation resistance(Among input, output and power)	$\geq 100M\Omega$;500V DC
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20℃ ~ +60℃
Suitable IS apparatus	2-wire/3-wire transmitter, current source

Structure and Dimensions

AMG1032: 114.5mm × 99.0mm × 17.5mm

Application



1 input 1 output: AMG1041

Input	
Input current	0/4 ~ 20mA
Input voltage drop	$\leq 2V$
Output	
Output current/Load resistance	0/4 ~ 20mA / $R_L \leq 680\Omega$
Output voltage/Load resistance	0/1 ~ 5V / $R_L \geq 300k\Omega$
General parameter	
Supply voltage	20 ~ 30V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 20mA output)	$\leq 50mA$
Transfer accuracy (20℃, 4~20mA)	0.1%F.S. (Typical: 0.05%F.S.)
Temperature drift	0.005%F.S./℃
Response time	Reach 90% of final value in 3ms
Dielectric strength(Among input, output and power)	1500V AC;1min
Insulation resistance(Among input, output and power)	$\geq 100M\Omega$;500V DC
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20℃ ~ +60℃
Suitable IS apparatus	2-wire valve positioner, electric converter

1 input 1 output: AMG1041H

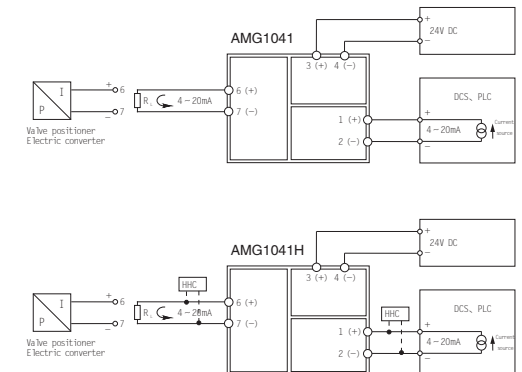
Input	
Input current	0/4 ~ 20mA
Input voltage drop	$\leq 2V$
Output	
Output current/Load resistance	0/4 ~ 20mA / $R_L \leq 680\Omega$
Output voltage/Load resistance	0/4 ~ 20mA (HART) / $R_L \geq 250\Omega$
	0/1 ~ 5V / $R_L \geq 300k\Omega$
General parameter	
Supply voltage	20 ~ 30V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 20mA output)	$\leq 50mA$
Transfer accuracy (20℃, 4~20mA)	0.1%F.S. (Typical: 0.05%F.S.)
Temperature drift	0.005%F.S./℃
Response time	Reach 90% of final value in 3ms
Dielectric strength(Among input, output and power)	1500V AC;1min
Insulation resistance(Among input, output and power)	$\geq 100M\Omega$;500V DC
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20℃ ~ +60℃
Suitable IS apparatus	2-wire valve positioner, electric converter

Structure and Dimensions

AMG1041: 92.4mm × 97.7mm × 7.6mm

AMG1041H: 92.4mm × 97.7mm × 7.6mm

Application



Isolated temperature transmitter (independent power supply)

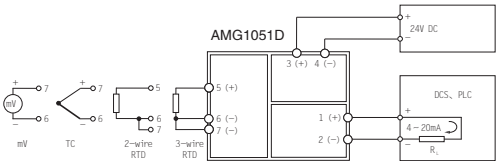
1 input 1 output: AMG1051D

Input	
Signal type and measure range	See the following table (Users can program)
Internal cold junction compensation range	-20℃ ~ +60℃
Cold junction compensation accuracy	±1℃, Intensive install: ±3℃
Output	
Output current/Load resistance	0/4 ~ 20mA / $R_L \leq 300\Omega$
Output voltage/Load resistance	0/1 ~ 5V / $R_L \geq 20k\Omega$
Upper/lower limit overflow alarm output current	$I_L=20.8mA$; $I_L=3.8mA$
Input breakage alarm output current	20.8mA
General parameter	
Supply voltage	20 ~ 35V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 20mA output)	$\leq 35mA$
Transfer accuracy (20℃)	See the following table (Cold junction compensation error not included)
Temperature drift	0.01%F.S./℃
Response time	Reach 90% of final value in 1s
Dielectric strength(Among input, output and power)	1500V AC;1min
Insulation resistance(Among input, output and power)	$\geq 100M\Omega$;500V DC
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20℃ ~ +60℃
Suitable IS apparatus	RTD, TC, mV signal sensor

Structure and Dimensions

AMG1051D: 92.4mm × 97.7mm × 7.6mm

Application



- Notes: 1. 3-wire RTD input, ensure resistance of 3 wire equal as far as possible;
2. 2-wire RTD input, terminals 6 & 7 must be shorted;
3. TC input, compensation wire shall be added.

Input signal and range list

	Type	Range	Min. Span	Accuracy
TC	T	-200℃ ~ +400℃	50℃	1℃ / 0.2%
	E	-200℃ ~ +900℃	50℃	1℃ / 0.2%
	J	-200℃ ~ +1200℃	50℃	1℃ / 0.2%
	K	-200℃ ~ +1372℃	50℃	1℃ / 0.2%
	N	-200℃ ~ +1300℃	50℃	1℃ / 0.2%
	R	0℃ ~ +1768℃	500℃	3℃ / 0.2%
	S	0℃ ~ +1768℃	500℃	3℃ / 0.2%
	B	+320℃ ~ +1820℃	500℃	3℃ / 0.2%
mV		-100mV ~ +100mV	10mV	40μV / 0.2%
RTD	Pt100	-200℃ ~ +850℃	20℃	0.4℃ / 0.2%
	Cu50	-50℃ ~ +150℃	20℃	0.4℃ / 0.2%
	Cu100	-50℃ ~ +150℃	20℃	0.4℃ / 0.2%

Note: "% " of transfer accuracy is relative to measure range, should take a bigger of range error and absolute error in application.



Isolated temperature transmitter (Loop-powered)

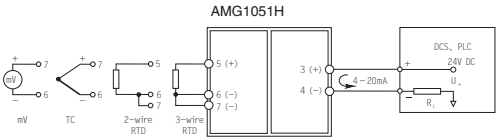
1 input 1 output: AMG1051H

Input	
Signal type and measure range	See the following table (Users can program)
Internal cold junction compensation range	-20℃ ~ +60℃
Cold junction compensation accuracy	±1℃, Intensive install: ±3℃
Output	
Output current	4 ~ 20mA
Load resistance	$R_L \leq (U-9) / 0.021$
Upper/lower limit overflow alarm output current	$I_L=20.8mA$; $I_L=3.8mA$
Input breakage alarm output current	20.8mA
General parameter	
Supply voltage (U_s)	9 ~ 30V DC
Power supply protection	Reverse Protection
Transfer accuracy (20℃)	See the following table (Cold junction compensation error not included)
Temperature drift	0.01%F.S./℃
Response time	Reach 90% of final value in 1s
Dielectric strength(Among input, output and power)	1500V AC;1min
Insulation resistance(Among input, output and power)	$\geq 100M\Omega$;500V DC
电磁兼容性	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20℃ ~ +60℃
Suitable IS apparatus	RTD, TC, mV signal sensor

Structure and Dimensions

AMG1051H: 92.4mm × 97.7mm × 7.6mm

Application



- Notes: 1. 3-wire RTD input, ensure resistance of 3 wire equal as far as possible;
2. 2-wire RTD input, terminals 6 & 7 must be shorted;
3. TC input, compensation wire shall be added.

Input signal and range list

	Type	Range	Min. Span	Accuracy
TC	T	-200℃ ~ +400℃	50℃	1℃ / 0.2%
	E	-200℃ ~ +900℃	50℃	1℃ / 0.2%
	J	-200℃ ~ +1200℃	50℃	1℃ / 0.2%
	K	-200℃ ~ +1372℃	50℃	1℃ / 0.2%
	N	-200℃ ~ +1300℃	50℃	1℃ / 0.2%
	R	0℃ ~ +1768℃	500℃	3℃ / 0.2%
	S	0℃ ~ +1768℃	500℃	3℃ / 0.2%
	B	+320℃ ~ +1820℃	500℃	3℃ / 0.2%
mV		-100mV ~ +100mV	10mV	40μV / 0.2%
RTD	Pt100	-200℃ ~ +850℃	20℃	0.4℃ / 0.2%
	Cu50	-50℃ ~ +150℃	20℃	0.4℃ / 0.2%
	Cu100	-50℃ ~ +150℃	20℃	0.4℃ / 0.2%

Note: "% " of transfer accuracy is relative to measure range, should take a bigger of range error and absolute error in application.



1 input 2 outputs: AMG1055

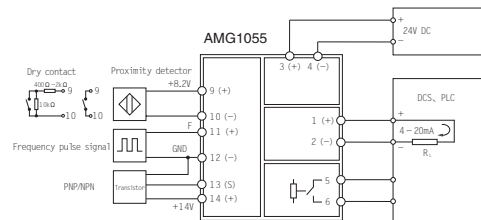
Input	
PNP / NPN transistor	Distribution voltage 14V, current <20mA, frequency≤100kHz
Frequency pulse signal	Max. input voltage 30V, frequency≤100kHz
Switch, proximity detector	Distribution voltage 8V, short circuit current 8mA, frequency≤100kHz
Pulse width	≥2μs
Output	
Output current/Load resistance	0/4 ~ 20mA/ $R_L \leq 400\Omega$
Output voltage/Load resistance	0/1 ~ 5V / $R_L \geq 300k\Omega$
Alarm output	1 channel relay
Drive ability	250V AC, 2A or 30V DC, 2A Resistive load
Response time	≤20ms
General parameter	
Supply voltage	20 ~ 35V DC
Power supply protection	Reverse Protection
Current consumption(at 24V supply, 20mA output)	≤90mA
Transfer accuracy (20℃)	0.1%F.S. (Typical≤0.05%F.S.)
Temperature drift(-20℃ ~ +60℃)	0.01% F.S./℃
Dielectric strength(Among input, output and power)	1500V AC; 1min
Insulation resistance(Among input, output and power)	≥100MΩ; 500V DC
EMC	GB/T 18268 (IEC 61326-1)
Ambient temperature	-20℃ ~ +60℃
Suitable IS apparatus	DIN 19234 standard NAMUR proximity detector, dry contact, level pulse signal, 3-wire PNP/NPN sensor, incremental encoder

Structure and Dimensions

AMG1055: 114.5mm × 99.0mm × 22.5mm



Application



Cause and solution of interference

In industrial production process need to use varieties of automatic instruments, control systems and actuators to realize monitoring and control. Signal transmission among them both have small signals like mv, mA, large signals like dozens of volts, even thousands of volts, hundreds of amperes; Have low frequency DC signal and high frequency pulse signal also. Sometimes found signal transmission interference between instruments and system which cause system instability even incorrect operation. Under this circumstance, except for poor anti-EMI performance of equipment or instrument, also may mainly caused by the following reasons.

Multi-point grounding form "grounding loop" effect

Due to varieties of reasons may multi-point grounding exist, thus potential difference may exist between equipment signal reference which form "grounding loop" and cause distortion during signal transmission(Fig. 1)

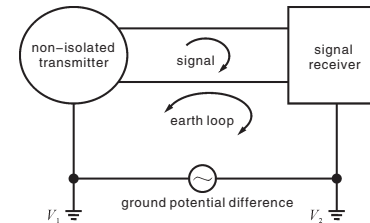


Fig. 1

To solve "grounding loop" signal distortion, according to theory and practice analyze, there are three solutions:

First way: All field equipments not grounded, thus there is only one grounding point in process circuit which cannot form loop-circuit. This way looks simple but is hard to realize in actual application because some equipments require that only grounding can ensure measurement accuracy or personal safety. Some equipments may form a new grounding point because of insulation decrease after suffering long-term corrosion and abrasion or climate effect.

Second way: Try to make the two grounding point become the same potential(as Fig.1, $V_1=V_2$), but due to the grounding resistor affected by many factors like geological conditions and climate change, this way actually cannot realize in reality.

Third way: Using signal isolation in each process circuit, disconnect process circuit and not affect normal transmission of process signal at the same time, so that solve the grounding loop problem thoroughly(Fig. 2).

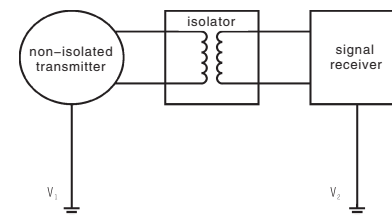


Fig. 2

EMI, high frequency signal infiltration

In industrial process monitoring system, always occur measured signal instability, one situation was caused by EMI (Fig. 3). The other reason may be high frequency signal infiltration, like current signal output control inverter, the high frequency interference of converter infiltrate into signal, so that the inverter and valve does not work stable and normal, as Fig.4

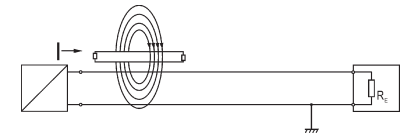


Fig. 3

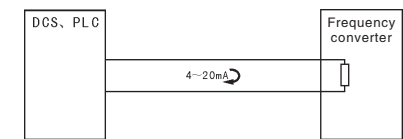


Fig. 4

To solve EMI, high frequency signal infiltration effect, add appropriate signal isolators between signal connection of two equipments is one of the most effective ways according to experimental experience, illustrate as Fig.5 Fig.6.

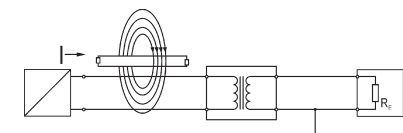


Fig. 5

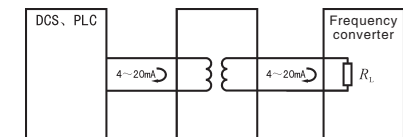


Fig. 6

General Description of SPD (Surge Protective device)

AML range SPD

AML range SPDs are designed for those vulnerable industrial automation control systems. When surge occurs, they response instantaneously and connect the protected lines to the equipotential bonding system to dis-charge the surge current and limit the voltage so as to protect the elec-trical and electronic devices.

Signal and DC power supply SPDs are both multi-stage SPDs which can protect pressure/flow/temperature transmitters, positioners, solenoid valves, proximity switches, thermocouple, thermal resistors, communication signals and DC power supplies

In an intrinsic safety automation control system, intrinsic safety SPDs are needed.

Feature

signal and DC power supply SPDs

7.6mm small thickness

working voltage optional for different I/Os

discharge current up to 10kA (8/20 μ s)

total discharge current up to 20kA (8/20 μ s)

ground through terminals or DIN 35mm rails

Explosion-proof certification: Ex ia IIC T4~T6

AC power supply SPDs

status indication:

green window: OK

red window: failed

protective modules hot-pluggable, easy maintenance

Max. discharge current up to 40kA (8/20 μ s)

Compliant criterias and certifications

Compliant criterias:

GB/T 18802.21-2012 (Low voltage surge protective devices - Part 21: Surge protective devices connected to telecommunications and signal networks -- Performance requirements and tests) (IEC 61643.21-2012)

GB18802.1-2011 (Surge protective devices connect to low-voltage power distribution systems-requirements and tests) (IEC 61643.1-2011)

Certifications:

Protection performance test by Shanghai Lightning Protection Center
Explosion-proof certification by NEPSI

General information

Operation environment

SPDs should be installed where there is no strong vibration, no corrosive gas or dust

Continuous operation temperature: -40°C ~ +80°C

Relative humidity: 10%~90%

Storage environment:

Temperature: -40°C ~ +80°C

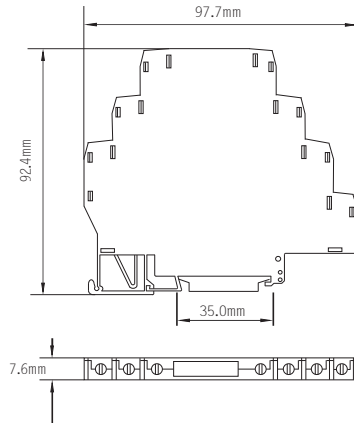
Relative humidity: 10%~90%

Dimensions

Signal and DC power supply SPDs

mounting method: standard DIN35mm rail

dimension: 92.4mm×97.7mm×7.6mm



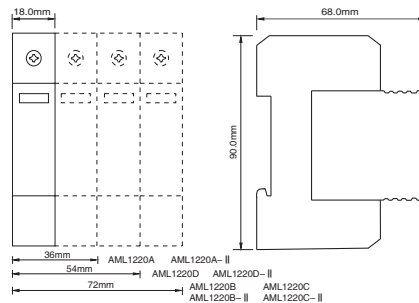
mounting method: standard DIN35mm rail

dimension: 92.4mm×97.7mm×7.6mm

AC power supply SPDs

mounting method: standard DIN35mm rail

dimension: 63.0mm×91.0mm×18.0mm per mode(AML1220 range)



Selection guide

AML1000 range intrinsic safety SPD for signal

Model number	Wires Protected	Nominal operation voltage Un	Max. operation voltage Uc	Nominal discharge current In(8/20 μ s)	Max. discharge current Imax(8/20 μ s)	Voltage Protection level Up(8/20 μ s)	Applied objects	Page
AML1005EA	2	5V	6V	5kA	10kA	40V	thermocouple	45
AML1005EB	3	5V	6V	5kA	10kA	40V	thermal resistor	45
AML1005EC	2	5V	6V	5kA	10kA	40V	RS-485	45
AML1021E	2	24V	32V	5kA	10kA	60V	2 wire transmitters or switches	46
AML1021EB	3	24V	32V	5kA	10kA	60V	3 wire transmitters or switches	46

AML1000 range non-intrinsic safety SPD for signal

Model number	Wires Protected	Nominal operation voltage Un	Max. operation voltage Uc	Nominal discharge current In(8/20 μ s)	Max. discharge current Imax(8/20 μ s)	Voltage Protection level Up(8/20 μ s)	Applied objects	Page
AML1005A	2	5V	6V	5kA	10kA	40V	thermocouple	47
AML1005B	3	5V	6V	5kA	10kA	40V	thermal resistor	47
AML1005C	2	5V	6V	5kA	10kA	40V	RS-485	47
AML1021	2	24V	32V	5kA	10kA	60V	2 wire transmitters or switches	48
AML1021B	3	24V	32V	5kA	10kA	60V	3 wire transmitters or switches	48

AML1000 range screwable SPD for signal

Model number	Wires Protected	Nominal operation voltage Un	Max. operation voltage Uc	Nominal discharge current In(8/20 μ s)	Max. discharge current Imax(8/20 μ s)	Voltage Protection level Up(8/20 μ s)	Applied objects	Page
AML1021X	2/3/4	24V	48V	5kA	10kA	85V	transmitters	49

AML1000 range SPD for DC power

Model number	Wires Protected	Nominal operation voltage Un	Max. operation voltage Uc	Nominal discharge current In(8/20 μ s)	Max. discharge current Imax(8/20 μ s)	Voltage Protection level Up(8/20 μ s)	Applied objects	Page
AML1024		24V	32V	5kA	10kA	85V	equipments which need an extra 24V power	50

AML1000 range SPD for AC power supply

Model number	Wires Protected	Nominal operation voltage Un	Max. operation voltage Uc	Nominal discharge current In(8/20 μ s)	Max. discharge current Imax(8/20 μ s)	Voltage Protection level Up(8/20 μ s)	Applied power supply system	Page
AML1220A	220VAC	320VAC	40A	10kA	20kA	1500V	Singal phase 2 or 3 wires	51
AML1220B	220VAC	320VAC	40A	10kA	20kA	1500V	TT	51
AML1220C	220VAC	320VAC	40A	10kA	20kA	1500V	TN-S	52
AML1220D	220VAC	320VAC	40A	10kA	20kA	1500V	TN-C	52
AML1220A-II	220VAC	440VAC	80A	20kA	40kA	2200V	Singal phase 2 or 3 wires	53
AML1220B-II	220VAC	440VAC	80A	20kA	40kA	2200V	TT	53
AML1220C-II	220VAC	440VAC	80A	20kA	40kA	2200V	TN-S	54
AML1220D-II	220VAC	440VAC	80A	20kA	40kA	2200V	TN-C	54

AML1000 range SPD for network

Model number	Wires Protected	Nominal operation voltage Un	Max. operation voltage Uc	Nominal discharge current In(8/20 μ s)	Max. discharge current Imax(8/20 μ s)	Voltage Protection level Up(8/20 μ s)	Applied interface	Page
AML10RJ11		110V	170V	2kA	4kA	250V	Rj11	55
AML10RJ45		5V	8V	2.5kA	5kA	40V	Rj45	55
AML10BNC-1	video	5V	8V	10kA	20kA	40V	BNC	56
AML10BNC-2	Power	24V	36V	10kA	20kA	60V	video, power 2 in 1	56
AML10BNC-3	control	24V	32V	10kA	20kA	60V	video, power, control 3 in 1	56

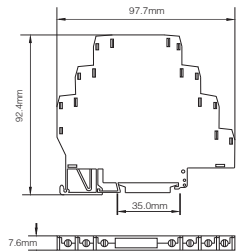
Intrinsic safety SPD for signal

Features

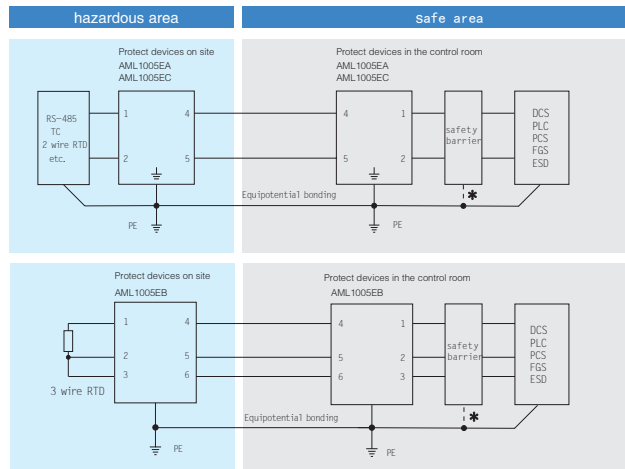
7.6mm small thickness
Low resistance
Discharge current up to 10kA (8/20 μ s)
Total discharge current up to 20kA (8/20 μ s)
Ground through terminals or DIN 35mm rails
Explosion-proof certification: Ex ia IIC T4~T6

Technical parameters	2 wires	3 wires	RS-485 (2 wires)
Nominal operation voltage Un (DC)	5V	5V	5V
Max. operation voltage Uc (DC)	6V	6V	6V
Rated current IL (DC)	250mA	250mA	250mA
Nominal discharge current In (8/20 μ s)	5kA	5kA	5kA
Max. discharge current I _{max} (8/20 μ s)	10kA	10kA	10kA
Total discharge current I _{total} (8/20 μ s)	20kA	20kA	20kA
Voltage protection level Up (8/20 μ s)	40V	40V	40V
Bandwidth (–0.5dB)	10MHz	10MHz	10MHz
Response time	<1ns	<1ns	<1ns
Resistance per wire	1 Ω	1 Ω	1 Ω
Operation temperature	–40℃ ~ +85℃	–40℃ ~ +85℃	–40℃ ~ +85℃
Protection grade (acc. to IEC60529)	IP 20	IP 20	IP 20
Housing material / Flame retardant grade (UL94)	PA66 / V0	PA66 / V0	PA66 / V0
Compliant criterias	GB/T 18802.21–2016 / IEC61643–21	GB/T 18802.21–2016 / IEC61643–21	GB/T 18802.21–2016 / IEC61643–21
Certificates			
Explosion-proof certificate and related parameters authorized by NEPSI	Ex ia IIC T4~T6 U _i =6V, I _i =250mA, P _i =1.3W L _i =0mH, C _i =0 μ F	Ex ia IIC T4~T6 U _i =6V, I _i =250mA, P _i =1.3W L _i =0mH, C _i =0 μ F	Ex ia IIC T4~T6 U _i =6V, I _i =250mA, P _i =1.3W L _i =0mH, C _i =0 μ F
Protection performance test	Shanghai Lightning Protection Center		

Dimension



Typical applications



* Note: If a zener safety barrier is used, ground zener safety barrier to SPD first.

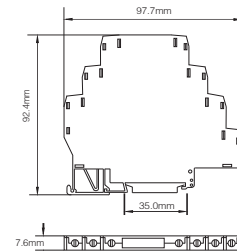
Intrinsic safety SPD for signal

Features

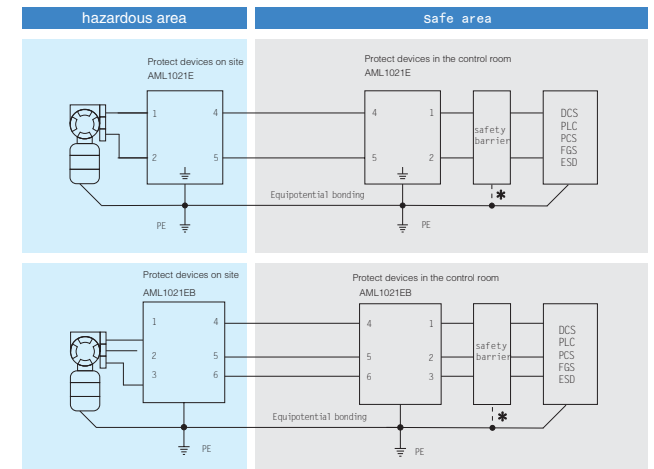
7.6mm small thickness
Low resistance
Discharge current up to 10kA (8/20 μ s)
Total discharge current up to 20kA (8/20 μ s)
Ground through terminals or DIN 35mm rails
Explosion-proof certification: Ex ia IIC T4~T6

Technical parameters	2 wires	3 wires
Nominal operation voltage Un (DC)	24V	24V
Max. operation voltage Uc (DC)	32V	32V
Rated current IL (DC)	250mA	250mA
Nominal discharge current In (8/20 μ s)	5kA	5kA
Max. discharge current I _{max} (8/20 μ s)	10kA	10kA
Total discharge current I _{total} (8/20 μ s)	20kA	20kA
Voltage protection level Up (8/20 μ s)	60V	60V
Bandwidth (–0.5dB)	10MHz	10MHz
Response time	<1ns	<1ns
Resistance per wire	1 Ω	1 Ω
Operation temperature	–40℃ ~ +85℃	–40℃ ~ +85℃
Protection grade (acc. to IEC60529)	IP 20	IP 20
Housing material / Flame retardant grade (UL94)	PA66 / V0	PA66 / V0
Compliant criterias	GB/T 18802.21–2016 / IEC61643–21	GB/T 18802.21–2016 / IEC61643–21
Certificates		
authorized by NEPSI		
Protection performance test	Shanghai Lightning Protection Center	

Dimension



Typical applications



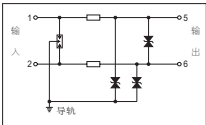
* Note: If a zener safety barrier is used, ground zener safety barrier to SPD first.

Non-Intrinsic safety SPD for signal

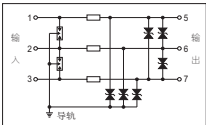
Features

- 7.6mm small thickness
- Low resistance
- Discharge current up to 10kA (8/20 μs)
- Total discharge current up to 20kA (8/20 μs)
- Ground through terminals or DIN 35mm rails

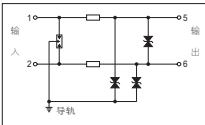
AML1005A



AML1005B

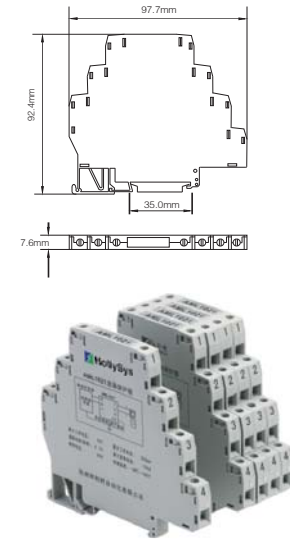


AML1005C

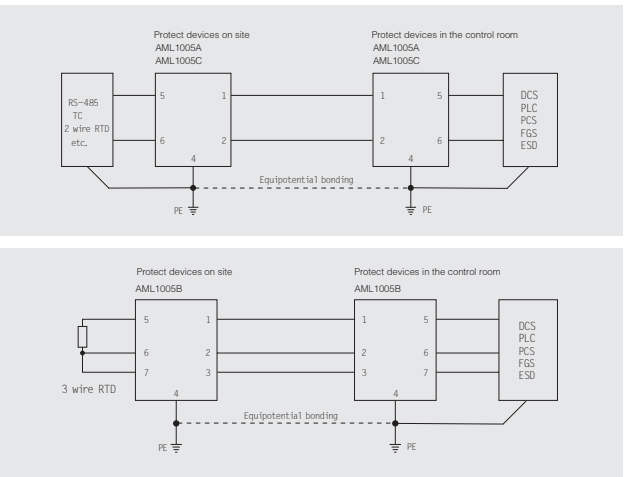


Technical parameters	2 wires	3 wires	RS-485 (2 wires)
Nominal operation voltage Un (DC)	5V	5V	5V
Max. operation voltage Uc (DC)	6V	6V	6V
Rated current IL (DC)	250mA	250mA	250mA
Nominal discharge current In (8/20 μs)	5kA	5kA	5kA
Max. discharge currentImax (8/20 μs)	10kA	10kA	10kA
Total discharge currentItotal (8/20 μs)	20kA	20kA	20kA
Voltage protection level Up (8/20 μs)	40V	40V	40V
Bandwidth (-0.5dB)	10MHz	10MHz	10MHz
Response time	<1ns	<1ns	<1ns
Resistance per wire	1 Ω	1 Ω	1 Ω
Operation temperature	-40℃ ~ +85℃	-40℃ ~ +85℃	-40℃ ~ +85℃
Protection grade (acc. to IEC60529)	IP 20	IP 20	IP 20
Housing material / Flame retardant grade (UL94)	PA66 / V0	PA66 / V0	PA66 / V0
Compliant criterias	GB/T 18802.21-2016 / IEC61643-21	GB/T 18802.21-2016 / IEC61643-21	GB/T 18802.21-2016 / IEC61643-21
Certificates	Shanghai Lightning Protection Center		
Protection performance test			

Dimension



Typical applications

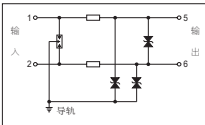


Non-Intrinsic safety SPD for signal

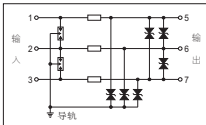
Features

- 7.6mm small thickness
- Low resistance
- Discharge current up to 10kA (8/20 μs)
- Total discharge current up to 20kA (8/20 μs)
- Ground through terminals or DIN 35mm rails

AML1021

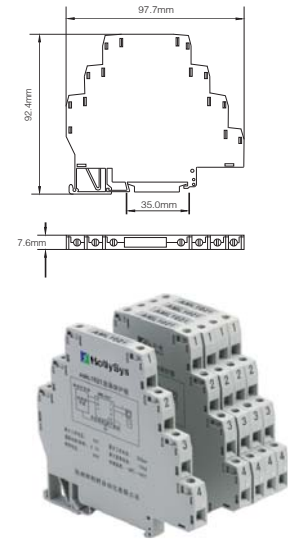


AML1021B

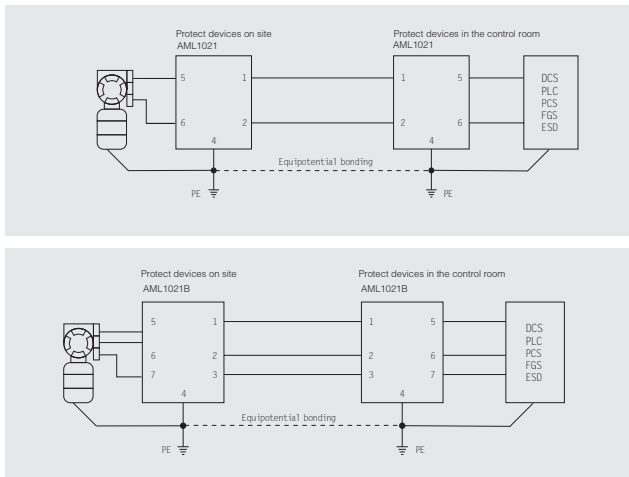


Technical parameters	2 wires	3 wires
Nominal operation voltage Un (DC)	24V	24V
Max. operation voltage Uc (DC)	32V	32V
Rated current IL (DC)	250mA	250mA
Nominal discharge current In (8/20 μs)	5kA	5kA
Max. discharge currentImax (8/20 μs)	10kA	10kA
Total discharge currentItotal (8/20 μs)	20kA	20kA
Voltage protection level Up (8/20 μs)	60V	60V
Bandwidth (-0.5dB)	10MHz	10MHz
Response time	<1ns	<1ns
Resistance per wire	1 Ω	1 Ω
Operation temperature	-40℃ ~ +85℃	-40℃ ~ +85℃
Protection grade (acc. to IEC60529)	IP 20	IP 20
Housing material / Flame retardant grade (UL94)	PA66 / V0	PA66 / V0
Compliant criterias	GB/T 18802.21-2016 / IEC61643-21	GB/T 18802.21-2016 / IEC61643-21
Certificates	Shanghai Lightning Protection Center	
Protection performance test		

Dimensions



Typical applications



signal SPD for on site installation

Features

Special design for on site installation
No(Low) signal attenuation
Discharge current up to 10kA (8/20 μ s)
Total discharge current up to 20kA (8/20 μ s)
Suitable for 2 wire transmitters, 3 wire transmitters and instruments which output voltage, current and frequency.

Technical parameters

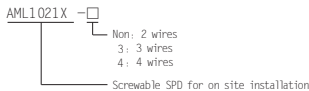
	2 wires	3 wire	4 wires
Nominal operation voltage Un (DC)	24V	24V	24V
Max. operation voltage Uc (DC)	48V	48V	48V
Nominal discharge current In (8/20 μ s)	5kA	5kA	5kA
Max. discharge current Imax (8/20 μ s)	10kA	10kA	10kA
Total discharge current Itotal (8/20 μ s)	20kA	20kA	20kA
Voltage protection level Up (8/20 μ s, L-L)	60V	60V	60V
Voltage protection level Up (8/20 μ s, L-G)	600V	600V	600V
Bandwidth (-0.5dB)	10MHz	10MHz	10MHz
Response time	<1ns	<1ns	<1ns
Operation temperature	-40 $^{\circ}$ C ~ +85 $^{\circ}$ C	-40 $^{\circ}$ C ~ +85 $^{\circ}$ C	-40 $^{\circ}$ C ~ +85 $^{\circ}$ C
Protection grade (acc. to IEC60529)	IP 65	IP 65	IP 65
Housing material	304 stainless steel	304 stainless steel	304 stainless steel
Compliant criterias	GB/T 18802.21-2016 / IEC61643-21	GB/T 18802.21-2016 / IEC61643-21	GB/T 18802.21-2016 / IEC61643-21

Certificates

Protection performance test

Shanghai Lightning Protection Center

Model name explanation

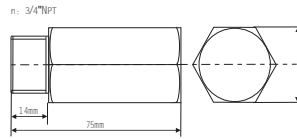
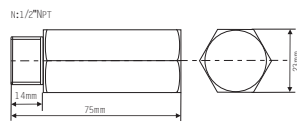
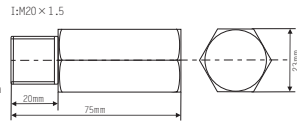


The thread must be specified in orders.

I: M20 \times 1.5
N: 1/2" NPT
n: 3/4" NPT

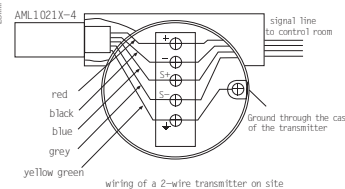
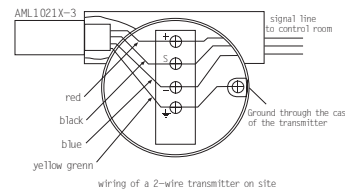
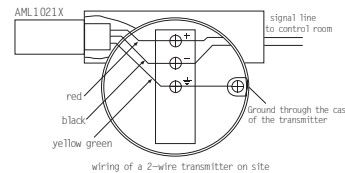


Dimension



Note: Cable specification 32/0.2 (1.0mm², 18AWG), 180mm.

Typical applications



SPD for DC power supply

Features

7.6mm small thickness
Discharge current up to 10kA (8/20 μ s)
Total discharge current up to 20kA (8/20 μ s)
Ground through terminals or DIN 35mm rails
Suitable for DC power consumption devices

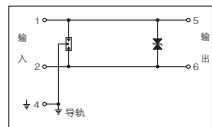
Technical parameters

Nominal operation voltage Un (DC)	24V
Max. operation voltage Uc (DC)	32V
Rated current IL (DC)	16A
Nominal discharge current In (8/20 μ s)	5kA
Max. discharge current Imax (8/20 μ s)	10kA
Total discharge current Itotal (8/20 μ s)	20kA
Voltage protection level Up (8/20 μ s, L-L)	85V
Voltage protection level Up (8/20 μ s, L-G)	600V
Response time	<1ns
Operation temperature	-40 $^{\circ}$ C ~ +85 $^{\circ}$ C
Protection grade (acc. to IEC60529)	IP 20
Housing material / Flame retardant grade (UL94)	PA66 / V0
Compliant criterias	GB/T 18802.21-2016

Certificates

Protection performance test

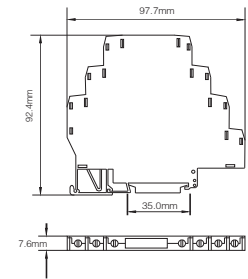
AML1024



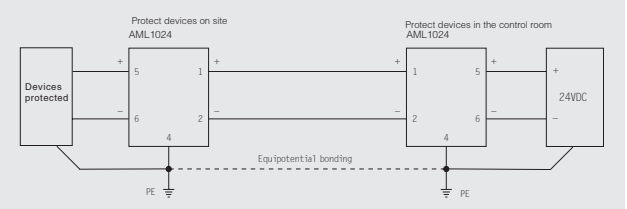
Nominal operation voltage Un (DC)	24V
Max. operation voltage Uc (DC)	32V
Rated current IL (DC)	16A
Nominal discharge current In (8/20 μ s)	5kA
Max. discharge current Imax (8/20 μ s)	10kA
Total discharge current Itotal (8/20 μ s)	20kA
Voltage protection level Up (8/20 μ s, L-L)	85V
Voltage protection level Up (8/20 μ s, L-G)	600V
Response time	<1ns
Operation temperature	-40 $^{\circ}$ C ~ +85 $^{\circ}$ C
Protection grade (acc. to IEC60529)	IP 20
Housing material / Flame retardant grade (UL94)	PA66 / V0
Compliant criterias	GB/T 18802.21-2016

Shanghai Lightning Protection Center

Dimensions



Typical application



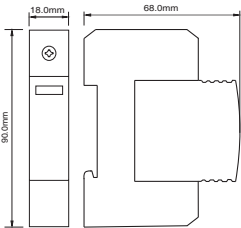
SPD for AC power supply

Features

Status indication:
Green widow: OK
Red window: Failed
Protection module hot-pluggable, easy maintenance
Mounted by DIN35mm rail
Suitable for single-phase and three-phase AC power consuming equipment
Suitable for lightning protection Zone 2, 3

Technical parameters		AML1220-G	
Nominal operation voltage Un	220VAC	220VAC	
Max. operation voltage Uc	320VAC	320VAC	255VAC
Nominal discharge current In (8/20 μs)	10kA	10kA	40kA
Max. discharge current Imax (8/20 μs)	20kA	20kA	60kA
Voltage protection level Up	<1500V	<1500V	<1200V
Max. backup fuse	40A gG	40A gG	
Response time	25ns	25ns	
Operation temperature	-40℃ ~ +70℃	-40℃ ~ +70℃	
Housing material (acc. to IEC60529)	IP 20	IP 20	
Housing material / Flame retardant grade (UL94)	PA66 / V0	PA66 / V0	
Compliant criterias	GB 18802.1-2011 / IEC61643-1	GB 18802.1-2011 / IEC61643-1	
Power supply systems suited	TN system, single phase(2 or 3 wires)	TT system	
Certificates			
Protection performance test	Shanghai Lightning Protection Center	Shanghai Lightning Protection Center	

Dimensions(single module)



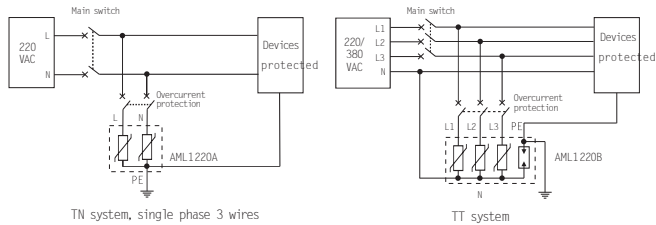
63.0mm × 91.0mm × 36.0mm



63.0mm × 91.0mm × 72.0mm



Typical applications



Notes:
An overcurrent protection device should be used ahead of AC power supply SPDs to avoid action of the main switch when SPDs failed or get shorted.
SPDs should be grounded reliably. A flexible cable with a cross-section area $\geq 2.5 \text{ mm}^2$ should be used to connect L/N and a flexible cable with a cross-section area $\geq 4 \text{ mm}^2$ should be used to connect PE.

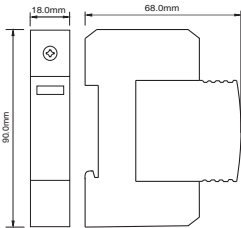
SPD for AC power supply

Features

Status indication:
Green widow: OK
Red window: Failed
Protection module hot-pluggable, easy maintenance
Mounted by DIN35mm rail
Suitable for single-phase and three-phase AC power consuming
Suitable for lightning protection Zone 2, 3

Technical parameters		AML1220-G	
Nominal operation voltage Un	220VAC	220VAC	
Max. operation voltage Uc	320VAC	320VAC	255VAC
Nominal discharge current In (8/20 μs)	10kA	10kA	40kA
Max. discharge current Imax (8/20 μs)	20kA	20kA	60kA
Voltage protection level Up	<1500V	<1500V	<1200V
Max. backup fuse	40A gG	40A gG	
Response time	25ns	25ns	
Operation temperature	-40℃ ~ +70℃	-40℃ ~ +70℃	
Housing material (acc. to IEC60529)	IP 20	IP 20	
Housing material / Flame retardant grade (UL94)	PA66 / V0	PA66 / V0	
Compliant criterias	GB 18802.1-2011 / IEC61643-1	GB 18802.1-2011 / IEC61643-1	
Power supply systems suited	TN-S system	TN-C system, IT system	
Certificates			
Protection performance test	Shanghai Lightning Protection Center	Shanghai Lightning Protection Center	

Dimension



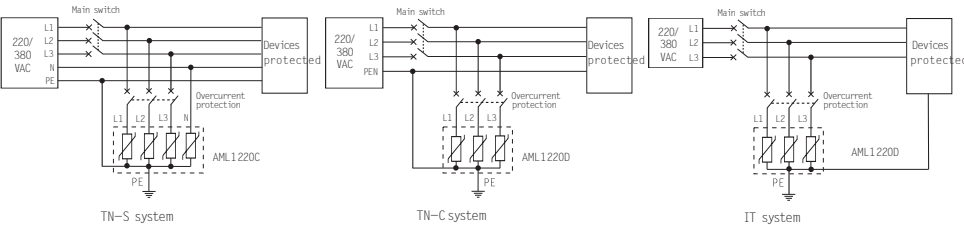
63.0mm × 91.0mm × 72.0mm



63.0mm × 91.0mm × 54.0mm



Typical applications



Notes:
An overcurrent protection device should be used ahead of AC power supply SPDs to avoid action of the main switch when SPDs failed or get shorted.
SPDs should be grounded reliably. A flexible cable with a cross-section area $\geq 4 \text{ mm}^2$ should be used to connect L/N and a flexible cable with a cross-section area $\geq 6 \text{ mm}^2$ should be used to connect PE.

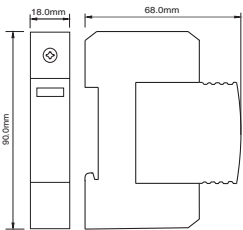
SPD for AC power supply

Features

Status indication:
Green widow: OK
Red window: Failed
Protection module hot-pluggable, easy maintenance
Mounted by DIN35mm rail
Suitable for single-phase and three-phase AC power consuming equipment
Suitable for lightning protection Zone 2, 3

Technical parameters		AML1220-G	
Nominal operation voltage Un	220VAC	220VAC	
Max. operation voltage Uc	440VAC	440VAC	255VAC
Nominal discharge current In (8/20 μs)	20kA	20kA	40kA
Max. discharge current Imax (8/20 μs)	40kA	40kA	60kA
Voltage protection level Up	<2200V	<2200V	<1200V
Max. backup fuse	80A gG	80A gG	
Response time	25ns	25ns	
Operation temperature	-40℃ ~ +70℃	-40℃ ~ +70℃	
Housing material (acc. to IEC60529)	IP 20	IP 20	
Housing material / Flame retardant grade (UL94)	PA66 / V0	PA66 / V0	
Compliant criterias	GB 18802.1-2011 / IEC61643-1	GB 18802.1-2011 / IEC61643-1	
Power supply systems suited	TN system, single phase(2 or 3 wires)	TT system	
Certificates			
Protection performance test		Shanghai Lightning Protection Center	Shanghai Lightning Protection Center

Dimensions(single module)



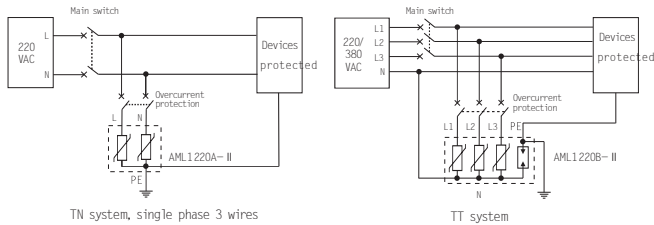
63.0mm × 91.0mm × 36.0mm



63.0mm × 91.0mm × 72.0mm



Typical applications



Notes:
An overcurrent protection device should be used ahead of AC power supply SPDs to avoid action of the main switch when SPDs failed or get shorted.
SPDs should be grounded reliably. A flexible cable with a cross-section area $\geq 4 \text{ mm}^2$ should be used to connect L/N and a flexible cable with a cross-section area $\geq 6 \text{ mm}^2$ should be used to connect PE.

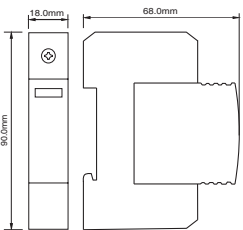
SPD for AC power supply

Features

Status indication:
Green widow: OK
Red window: Failed
Mounted by DIN35mm rail
Protection module hot-pluggable, easy maintenance
Suitable for single-phase and three-phase AC power consuming equipment
Suitable for lightning protection Zone 2, 3

Technical parameters			
Nominal operation voltage Un	220VAC	220VAC	
Max. operation voltage Uc	440VAC	440VAC	
Nominal discharge current In (8/20 μs)	20kA	20kA	
Max. discharge current Imax (8/20 μs)	40kA	40kA	
Voltage protection level Up	<2200V	<2200V	
Max. backup fuse	80A gG	80A gG	
Response time	25ns	25ns	
Operation temperature	-40℃ ~ +70℃	-40℃ ~ +70℃	
Housing material (acc. to IEC60529)	IP 20	IP 20	
Housing material / Flame retardant grade (UL94)	PA66 / V0	PA66 / V0	
Compliant criterias	GB 18802.1-2011 / IEC61643-1	GB 18802.1-2011 / IEC61643-1	
Power supply systems suited	TN-S system	TN-C system, IT system	
Certificates			
Protection performance test		Shanghai Lightning Protection Center	Shanghai Lightning Protection Center

Dimension



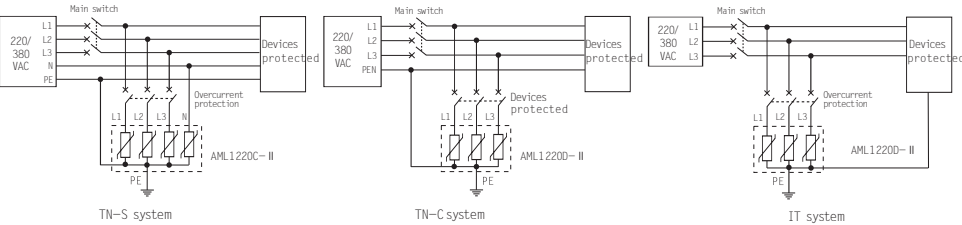
63.0mm × 91.0mm × 72.0mm



63.0mm × 91.0mm × 54.0mm



Typical applications



Notes:
An overcurrent protection device should be used ahead of AC power supply SPDs to avoid action of the main switch when SPDs failed or get shorted.
SPDs should be grounded reliably. A flexible cable with a cross-section area $\geq 4 \text{ mm}^2$ should be used to connect L/N and a flexible cable with a cross-section area $\geq 6 \text{ mm}^2$ should be used to connect PE.

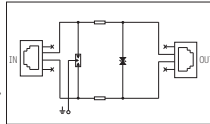
Features

good electromagnetic shielding because of the aluminum alloy enclosure

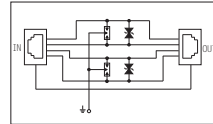
mounted by DIN 35mm rail is optional, please specify in orders.

suitable for networks such as telephone , fax, ADSL, ethernet and etc.

AML10RJ11
for phone



AML10RJ45
for ethernet



Technical parameters

Nominal operation voltage Un (DC)	110V	5V
Max. operation voltage Uc (DC)	170V	6V
Nominal discharge current In (8/20 μs)	2kA	2.5kA
Max. discharge currentImax (8/20 μs)	4kA	5kA
Voltage protection level Up (L-L)	280V	40V
Voltage protection level Up (L-G)	600V	600V
Bandwidth (-0.5dB)	10MHz	100MHz
Response time	<1ns	<1ns
Operation temperature	-40℃ ~ +85℃	-40℃ ~ +85℃
Protection grade (acc. to IEC60529)	IP 20	IP 20
Housing material	aluminum alloy	aluminum alloy
Number of wires protected	2	4
interface for connection	RJ11	RJ45
Compliant criterias	GB/T 18802.21-2016	GB/T 18802.21-2016

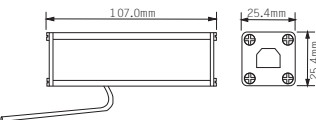
Certificates

Protection performance test

Shanghai Lightning Protection Center

Shanghai Lightning Protection Center

Dimensions



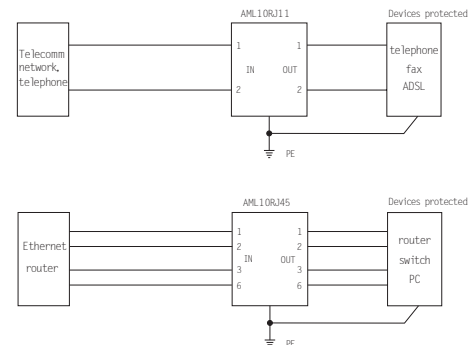
71.0mm × 25.0mm × 25.0mm



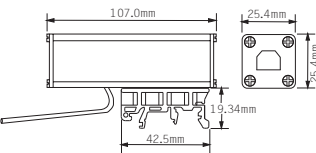
71.0mm × 25.0mm × 25.0mm



Typical applications



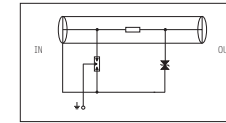
Dimensions (mounted by DIN 35mm rail)



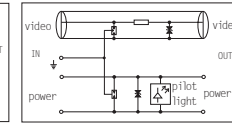
Features

Good electromagnetic shielding because of the aluminum alloy enclosure.
Suitable for video network.

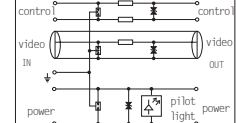
AML10BNC-1
for video



AML10BNC-2
video, power 2 in 1



AML10BNC-3
video, power, control 3 in 1



Technical parameters

Nominal operation voltage Un (DC)	5V	24V	24V
Max. operation voltage Uc (DC)	8V	36V	32V
Nominal discharge current In (8/20 μs)	10kA	10kA	10kA
Max. discharge currentImax (8/20 μs)	20kA	20kA	20kA
Voltage protection level Up (L-L)	40V	60V	60V
Voltage protection level Up (L-G)	600V	900V	600V
Bandwidth (-0.5dB)	20MHz	20MHz	20MHz
Response time	<10ns	<10ns	<10ns
Operation temperature	-40℃ ~ +70℃	-40℃ ~ +70℃	-40℃ ~ +70℃
Protection grade (acc. to IEC60529)	IP20	IP20	IP20
Housing material	aluminum alloy	aluminum alloy	aluminum alloy
interface for connection	BNC	screw terminals	screw terminals
Compliant criterias	GB/T 18802.21-2016	GB 18802.1-2011	GB/T 18802.21-2016

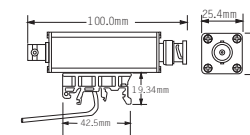
Certificates

Protection performance test

Shanghai Lightning Protection Center

Dimensions

AML10BNC-1 (Mounted by DIN rail is optional)



100.0mm × 25.0mm × 25.0mm



102.0mm × 76.0mm × 38.0mm

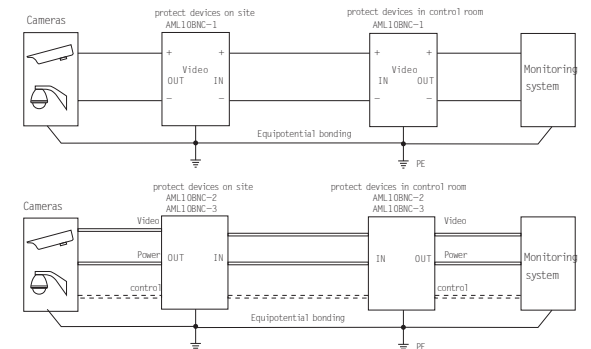
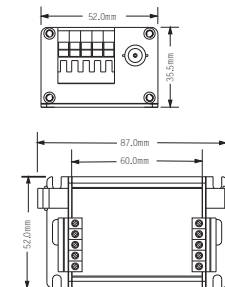


102.0mm × 76.0mm × 38.0mm



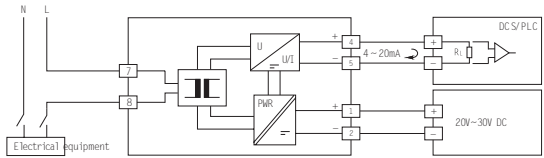
Typical applications

AML10BNC-2
AML10BNC-3:



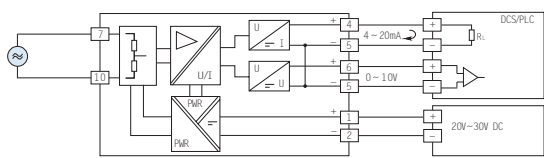
1. Principle of transmitter

1、Current transmitter



AC/DC current signal access transmitter through terminals or perforation, transfer into standard voltage or current signal and output through collection, transfer and isolated transmission of internal sensor.

2、Voltage transmitter



AC/DC voltage signal access transmitter through terminal, transfer into standard voltage or current signal and output through collection, tranfer and isolation transmission after internal resistance network divided.

3、Signal isolation

Current or voltage transmitter have three parts including power supply, input and output circuit. Each part are isolated through transformer or optocoupler to ensure electrical isolation of the connected equipment and keep safe.

2. Main parameter definition

- 1、Input current range: current range which can be measured by current transmitter.
- 2、Max. input current: current upper limit which is allowed input by the current transmitter that does not damage the performance of current transmitter, exceed this value may damage the transmitter forever.
- 3、Input voltage range: voltage range which can be measured by voltage transmitter.
- 4、Max. input voltage: voltage upper limit which is allowed input by the voltage transmitter that does not damage the performance of voltage transmitter, exceed this value may damage the transmitter forever.
- 5、Frequency range: input signal (current or voltage) virbaration frequency range which can be measured by transmitter exactly, if exceed the frequency range, the accuracy of transmitter will decrease.
- 6、Current output: transmitter indicated input signal at 4~20mA or 0~20mA.
- 7、Max. output current: when the transmitter is selected as current output, the possible max. output current after input signal exceed range.
- 8、Current output load: when the transmitter is selected as current output, the max. load resistance that is under range of current output and output accuracy.
- 9、Voltage output: transmitter indicated input signal at 0~5V or 0~10V.
- 10、Max. output voltage: when the transmitter is selected as voltage output, the possible max. output voltage after input signal exceed range.
- 11、Voltage output load: when the transmitter is selected as voltage output, the min. allowed external impedance under range of voltage output and output accuracy.

3. Special specification

- 1、When voltage output is $\pm 5V$ or $\pm 10V$, the output voltage value represent the direction of input signal, take $\pm 5V$ as an example, when input signal increased from 0A to 5A, output signal increased from 0V to 5V, when input signal decreased from 0A to -5A, output signal decreased from 0V to -5V.
- 2、Max. input voltage can be specified as 900V when ordering.
- 3、Max. input current of current transmitter is 60A, can be customized up to 100A, larger current measurement need to configure a current transformer into 0~5A or 0~10A signal, then connect into the current transmitter.

AD10SC series power transmitter

Model	Name	Input signal	Output signal	Power supply	Page
AD10SC-I-30	Current transmitter	0~20A/25A/30A AC/DC	4~20mA/0~20mA	20~30V DC	59
AD10SC-I-60	Current transmitter	0~40A/50A/60A AC/DC	0~5V/0~10V/±5V/±10V	20~30V DC	59

AD10 series small size power transmitter

Model	Name	Input signal	Output signal	Power supply	Page
AD10IA-10	AC current transmitter	0~5A/10A AC	4~20mA/1~5V	20~30V DC	60
AD10IA-10A	AC current transmitter	0~5A/10A AC	4~20mA/1~5V	90~260V AC	60
AD10ID-10	DC current transmitter	0~1A/2A/5A/10A DC	4~20mA/1~5V	20~30V DC	61
AD10ID-10A	DC current transmitter	0~1A/2A/5A/10A DC	4~20mA/1~5V	90~260V AC	61
AD10VA-370	AC voltage transmitter	0~500V AC	4~20mA/0~20mA/1~5V/0~5V/0~10V	20~30V DC	62
AD10VA-370A	AC voltage transmitter	0~30V/50V/120V/250V/500V AC	4~20mA/0~20mA/1~5V/0~5V/0~10V	90~260V AC	62
AD10VD-400	DC voltage transmitter	0~(10~100V DC), 0~(100~1000V DC)	4~20mA/1~5V	20~30V DC	63
AD10VD-400A	DC voltage transmitter	0~50V/70V/120V/250V/500V DC	4~20mA/0~20mA/1~5V/0~5V/0~10V	90~260V AC	63

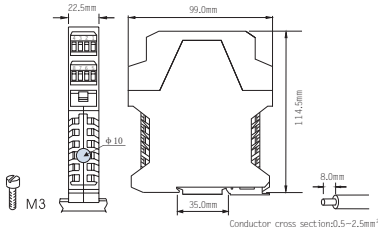
Single phase current transmitter

Characteristics

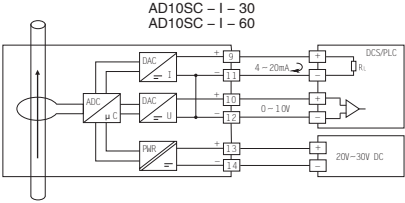
- Variety voltage, current output
- Output signal can represent DC direction
- Measure range selectable

AD10SC - I - 30		AD10SC - I - 60	
Input current access through perforation		Input current access through perforation	
Input parameter		Input parameter	
Input current range (I _{in})	0~20A/25A/30A AC/DC	0~40A/50A/60A AC/DC	
Max. input current (I _{max})	Depending on the wire retention capacity	Depending on the wire retention capacity	
Frequency range	15Hz~400Hz	15Hz~400Hz	
Output parameter		Output parameter	
Current output	4~20mA/0~20mA	4~20mA/0~20mA	
Max. output current	22mA	22mA	
Current output load	≤500Ω	≤500Ω	
Voltage output	0~5V/0~10V/±5V/±10V	0~5V/0~10V/±5V/±10V	
Max. output voltage	±12V	±12V	
Voltage output load	≥10kΩ	≥10kΩ	
General parameter		General parameter	
Supply voltage	20V~30V DC	20V~30V DC	
Rated power consumption	1.2W(50mA, 24V)	1.2W(50mA, 24V)	
Response time	<330ms	<330ms	
Basic accuracy	≤0.5% F.S.	≤0.5% F.S.	
Temperature Coefficient	≤0.03%/°C	≤0.03%/°C	
Ambient temperature	-20°C~+60°C	-20°C~+60°C	
Storage temperature	-40°C~+80°C	-40°C~+80°C	
Relative humidity	10%~90%	10%~90%	
Pollution degree	3	3	
EMC	GB/T 18268.1 (IEC 61326-1)	GB/T 18268.1 (IEC 61326-1)	
Dimensions	114.5mm×99.0mm×22.5mm	114.5mm×99.0mm×22.5mm	
Safety parameters		Safety parameters	
Insulation performance test standards	GB4793.1 (IEC 61010-1)	GB4793.1 (IEC 61010-1)	
Dielectric strength (input~power, output)	4000V AC, 1min	4000V AC, 1min	
Impulse voltage	4000V	4000V	
Insulation resistance	100MΩ	100MΩ	
IP degree (Comply with IEC60529)	IP20	IP20	

Dimensions



Application



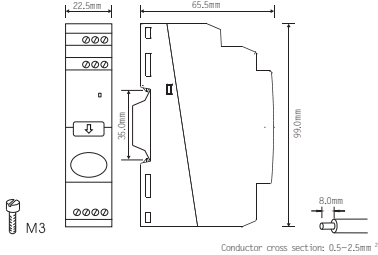
Single phase current transmitter

Characteristics

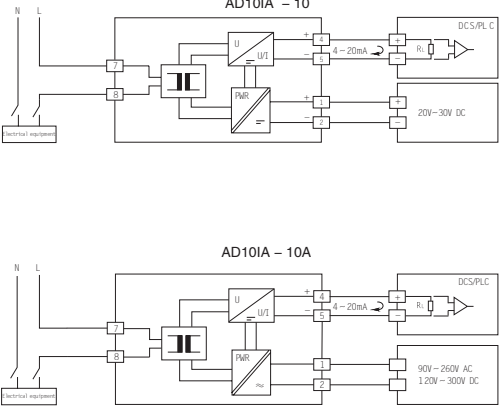
- Compact shell structure
- DIN35mm standard rail mounting
- Variety current, voltage output selectable

AD10IA - 10		AD10IA -10A	
Single phase AC current transmitter		Single phase AC current transmitter	
Input parameter		Input parameter	
Input current range (I _{in})	0A~5A/10A AC	0A~5A/10A AC	
Max. input current (I _{max})	1.2×I _{in} (continuous)	1.2×I _{in} (continuous)	
Frequency range	40Hz~60Hz	40Hz~60Hz	
Output parameter		Output parameter	
Current output	4~20mA	4~20mA	
Max. current output	30mA	30mA	
Current output load	≤550Ω	≤550Ω	
Voltage output	1~5V	1~5V	
Max. voltage output	15V	15V	
Voltage output load	≥300kΩ	≥300kΩ	
General parameter		General parameter	
Supply voltage	20V~30V DC	120V~300V DC/90V~260V AC	
Rated power consumption	1W(40mA, 24V)	3VA(1.2A)	
Response time	<330ms	<330ms	
Basic accuracy	≤0.5% F.S.	≤0.5% F.S.	
Temperature Coefficient	≤0.02%/°C	≤0.02%/°C	
Ambient temperature	-20°C~+60°C	-20°C~+60°C	
Storage temperature	-40°C~+80°C	-40°C~+80°C	
Relative humidity	10%~90%	10%~90%	
Pollution degree	3	3	
EMC	GB/T 18268.1 (IEC 61326-1)	GB/T 18268.1 (IEC 61326-1)	
Dimensions	99.0mm×65.5mm×22.5mm	99.0mm×65.5mm×22.5mm	
Safety parameters		Safety parameters	
Insulation performance test standards	GB4793.1 (IEC 61010-1)	GB4793.1 (IEC 61010-1)	
Dielectric strength (input~power, output)	4000V AC, 1min	4000V AC, 1min	
Impulse voltage	4000V	4000V	
Insulation resistance	100MΩ	100MΩ	
IP degree (Comply with IEC60529)	IP20	IP20	

Dimensions



Application



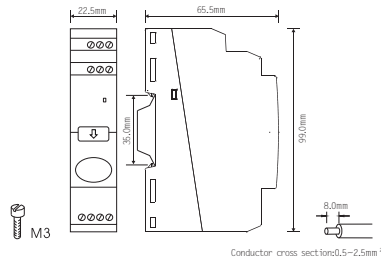
Single phase current transmitter

Characteristics

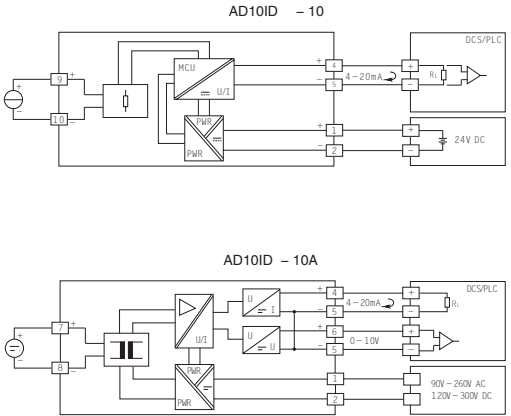
- Compact shell structure
- DIN35mm standard rail mounting
- Variety current, voltage output selectable

	AD10ID - 10	AD10ID -10A
Single phase DC current transmitter		
Input parameter		
Input current range (In)	0A~1A/2A/5A/10A DC	0A~1A/2A/5A/10A DC
Max. input current (Imax)	1.2×In (continues) , 2×In (1分钟)	1.2×In (continues)
Current input impedance	5mΩ	47mΩ/47mΩ/5mΩ/5mΩ
Output parameter		
Current output	0~20mA/4~20mA/~-20~20mA	4~20mA
Max. current output	24mA	30mA
Current output load	≤550Ω	≤550Ω
Voltage output	0~10V/0~5V/1~5V/~-10~10V	1~5V
Max. voltage output	12V	15V
Voltage output load	≥300kΩ	≥300kΩ
General parameter		
Supply voltage	20V~30V DC	120V~300V DC/90V~260V AC
Rated power consumption	≤1W	3VA(1.2W)
Response time	Reach 90% of final value in 200ms	<330ms
Basic accuracy	0.5%F.S.	≤0.5% F.S.
Temperature Coefficient	0.02%/°C	≤0.02%/°C
Ambient temperature	-20°C ~ +60°C	-20°C ~ +60°C
Storage temperature	-40°C ~ +80°C	-40°C ~ +80°C
Relative humidity	15%~90%	10%~90%
Pollution degree	3	3
EMC	GB/T 18268.1 (IEC 61326-1)	GB/T 18268.1 (IEC 61326-1)
Dimensions	99.0mm×65.5mm×22.5mm	99.0mm×65.5mm×22.5mm
Safety parameters		
Insulation performance test standards	GB4793.1 (IEC 61010-1)	GB4793.1 (IEC 61010-1)
Dielectric strength (input~power, output)	2500V AC, 1min	2500V AC, 1min
Impulse voltage	4000V	4000V
Insulation resistance	100MΩ	100MΩ
IP degree (Comply with IEC60529)	IP20	IP20

Dimensions



Application



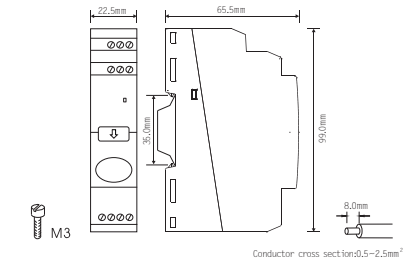
Single phase voltage transmitter

Characteristics

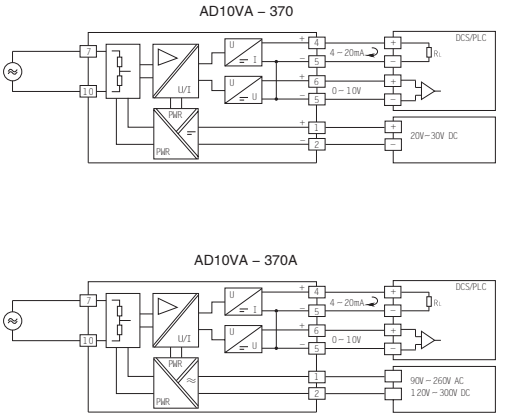
- Compact shell structure
- DIN35mm standard rail mounting
- Variety current, voltage output selectable

	AD10VA - 370	AD10VA - 370A
Single phase AC voltage transmitter		
Input parameter		
Input voltage range (Un)	0~500V AC (range can be configured)	0V~30V/50V/120V/250V/500V AC
Max. input voltage (Umax)	1.2×Un (continues)	1.2×Un (continues)
Voltage input impedance	800kΩ	60kΩ/100kΩ/240kΩ/500kΩ/1MΩ
Frequency range	40Hz~400Hz	40Hz~400Hz
Output parameter		
Current output	4~20mA/0~20mA	4~20mA/0~20mA
Max. current output	25mA	30mA
Current output load	≤550Ω	≤550Ω
Voltage output	1~5V/0~5V/0~10V	1~5V/0~5V/0~10V
Max. voltage output	12.5V	15V
Voltage output load	≥10kΩ	≥10kΩ
General parameter		
Supply voltage	20V~30V DC	120V~300V DC/90V~260V AC
Rated power consumption	1W(40mA, 24V)	3VA(1.2W)
Response time	<330ms	<330ms
Basic accuracy	≤0.5% F.S.	≤0.5% F.S.
Temperature Coefficient	≤0.02%/°C	≤0.02%/°C
Ambient temperature	-20°C ~ +60°C	-20°C ~ +60°C
Storage temperature	-40°C ~ +80°C	-40°C ~ +80°C
Relative humidity	10%~90%	10%~90%
Pollution degree	3	3
EMC	GB/T 18268.1 (IEC 61326-1)	GB/T 18268.1 (IEC 61326-1)
Dimensions	99.0mm×65.5mm×22.5mm	99.0mm×65.5mm×22.5mm
Safety parameters		
Insulation performance test standards	GB4793.1 (IEC 61010-1)	GB4793.1 (IEC 61010-1)
Dielectric strength (input~power, output)	2500V AC, 1min	2500V AC, 1min
Impulse voltage	4000V	4000V
Insulation resistance	100MΩ	100MΩ
IP degree (Comply with IEC60529)	IP20	IP20

Dimensions



Application



Characteristics

- Compact shell structure
- DIN35mm standard rail mounting
- Variety current, voltage output selectable

Input parameter

Input voltage range (Un)
Max. input voltage (Umax)
Voltage input impedance

Output parameter

Current output
Max. current output
Current output load
Voltage output
Max. voltage output
Voltage output load

General parameter

Supply voltage
Rated power consumption
Response time
Basic accuracy
Temperature Coefficient
Ambient temperature
Storage temperature
Relative humidity
Pollution degree
EMC
Dimensions

Safety parameters

Insulation performance test standards
Dielectric strength (input~power, output)
Impulse voltage
Insulation resistance
IP degree (Comply with IEC60529)

AD10VD - 400

Single phase DC voltage transmitter

0 ~ (10 ~ 100V DC), 0 ~ (100 ~ 1000V DC)
 $1.2 \times U_n$ (continues), $2 \times U_n$ (1 minute)
 $\geq 200k\Omega$ ($10V \leq \text{Input} \leq 100V$)
 $\geq 2M\Omega$ ($100V < \text{Input} \leq 1000V$)

0 ~ 20mA/4 ~ 20mA

24mA

$\leq 550\Omega$

0 ~ 10V/0 ~ 5V/1 ~ 5V

12V

$\geq 300k\Omega$

20V ~ 30V DC

$\leq 1W$

Reach 90% of final value in 200ms

0.1% F.S. (0 ~ 100V); 0.2% F.S. (0 ~ 1000V)

0.01% F.S./°C

-20°C ~ +60°C

-40°C ~ +80°C

15% ~ 90%

3

GB/T 18268 (IEC 61326-1)

99.0mm × 65.5mm × 22.5mm

GB4793.1 (IEC 61010-1)

2500V AC, 1min

4000V

100MΩ

IP20

AD10VD - 400A

Single phase DC voltage transmitter

50V/0V/120V/250V/500V DC
 $1.2 \times U_n$ (continues)
 $100k\Omega$ / $140k\Omega$ / $240k\Omega$ / $500k\Omega$ / $1M\Omega$

4 ~ 20mA/0 ~ 20mA

30mA

$\leq 550\Omega$

1 ~ 5V/0 ~ 5V/0 ~ 10V

15V

$\geq 10k\Omega$

120V ~ 300V DC/90V ~ 260V AC

3VA(1.2W)

$< 100ms$

$\leq 0.2\%$ F.S.

$\leq 0.01\%$ /°C

-20°C ~ +60°C

-40°C ~ +80°C

10% ~ 90%

3

GB/T 18268.1 (IEC 61326-1)

99.0mm × 65.5mm × 22.5mm

GB4793.1 (IEC 61010-1)

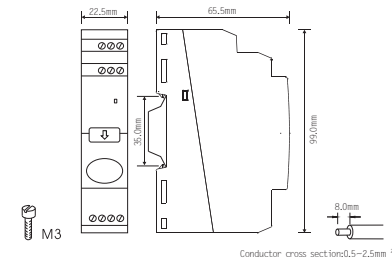
2500V AC, 1min

4000V

100MΩ

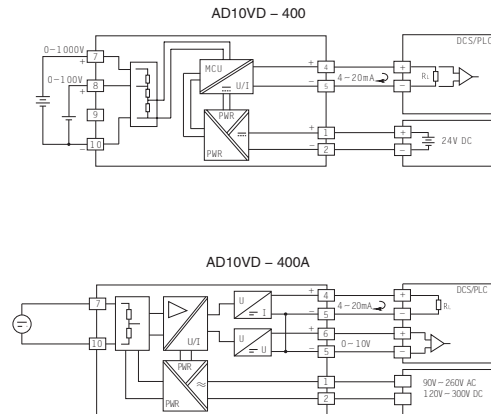
IP20

Dimensions



Conductor cross section: 0.5~2.5mm²

Application



HOLLIAS Config software

HOLLIAS Config is configure software of AM1000EX/AM2000EX series isolated barrier. Based on Windows system, using USB interface, easy to use and with friendly interface. Users can configure parameters such as sensor type, measure range, alarm current, damping coefficient, temperature drift of RTD/TC input isolated barrier through this software.

SW/HW configuration requirements

Operating system: Windows2000, WindowsXP

Hardware interface: USB

Dedicated communication adapter: HOLLIAS Config USB
(Dedicated USB - RS232 serial cable)

Hardware connection shown as Fig 1



Fig 1 Hardware connection diagram

Install serial USB Driver

After installing drive program successfully, connect communication adapter to USB port on PC side to verify: right click on "My computer", select "Manage" item to access "Computer management" interface, click "Device manager" on the left side of menu, then double-click "Port (COM and LPT)" on the right menu, its lower menu will display "com*" in "prolific USB-to-Serial Comm Port(com*)" is the converted serial port number, shown as Fig 2.

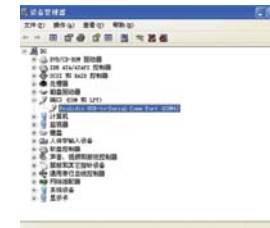


Fig 2 COM port number

Install HOLLIAS Config

Install according to the installation prompt procedure, shortcut will be created automatically on the desktop after succeed in installing.

Type selection

After ensuring both side of communication cable are reliable connected and instrument under test is powered normally, double-click the desktop shortcut of configuration software, type selection interface will appear, shown as Fig 3.



Fig 3 Type selection interface

COM ports setting

Usually program will search the correct port automatically. Click on test connection, usually it will prompt connection successfully, if prompt fail to connect, please refer to "Configuration software installation" to view the actual connecting COM port number, and choose the correct port in "COM ports setting" interface.

Configuration interface

Access configuration interface through menu "Instrument -> Configuration" or through clicking "Start communication" after succeed in connecting through click "Start communication" after succeed in connecting. Users can modify parameters such as sensor type (graduation number), input temperature range, RTD connection mode, temperature drift, damping coefficient in configuration interface. Shown as Fig 4.



Fig 4 Configuration interface

Monitoring interface

Access monitoring interface through menu "Instrument -> Monitor". The main function of monitoring interface is real-time display temperature, cold junction compensation, output current, alarm status, etc. Shown as Fig 5.



Fig 5 Monitoring interface

Enclosure of isolated barriers

AM1000EX series isolated barriers adopt DME series plastic enclosure which is injected with completely insulated material. The enclosure is connected by locking, does not need dedicated tool to install or disassemble, easy to separate the enclosure. This series isolated barriers are with removable terminals. Signal terminals leading to hazardous area adopts blue terminals which is easy to recognize. This product installed on standard 35mmDIN rail.



Wire connection

Copper cross section area of connected wire should be, 0.5mm²~2.5mm², dielectric strength should over 500V. A length of 8mm bared wire is locked by the M3 bolt. Choose blue-marked intrinsically safe wire for the intrinsically safe area.

- 1) Insert the stripped connection wire into the mounting hole;
- 2) Tighten and fix with a screwdriver.



Disassembly of terminals

AM1000EX series isolated barriers are with removable terminals.

- 1) Insert the straight screwdriver into the gap of terminal and housing;
- 2) Pull outside the terminal.



Disassembly

The front panel housing is tightly joined together with the base housing through the structural parts without using any other auxiliary devices such as screws.

- 1) Open the housing, only need to push inside the orange locking both on side tightly.



- 2) Gently pull the front panel housing together with the circuit board from the guide rail of the base.
- 3) When assembling, insert the front panel housing together with the circuit board into the guide rail of the base so that the front panel housing is in close contact with the base housing, and the lock will be locked automatically.



Installation requirements of isolated barrier

Isolated barrier should be located at safe area, comply with the related requirements in GB 50257-1996, GB 3836.15-2000 GB 3836.13-2003 and GB 3836.16-2006.

Arrangement of isolated barrier

Dimensions of cabinet: 800mm × 2100mm × 800mm

Open the cabinet from back and forth, fan at top of the cabinet. Ventilated window on the door with filter.

Installation density of isolated barrier

Install two column isolated barrier back and forth.

Isolated barrier dimensions

114.5mm × 99.0mm × 12.5mm

114.5mm × 99.0mm × 17.5mm

About 82 isolated barriers can be installed front in each column (regulated power supply installed front)

About 96 isolated barriers can be installed back in each column
About 356 isolated barriers can be installed in each cabinet.

Each cabinet needs install accessories as below

- 1) 2 Regulated power supplies with 24VDC/20A
- 2) 2 power circuit breakers with 220VAC
- 3) 4 circuit breakers with 24VDC, install 2 pieces both back and forth
- 4) 4 installation rails: standard 35mmDIN rail, about 1800mm each rail
- 5) 8 wiring ducts

Wiring density

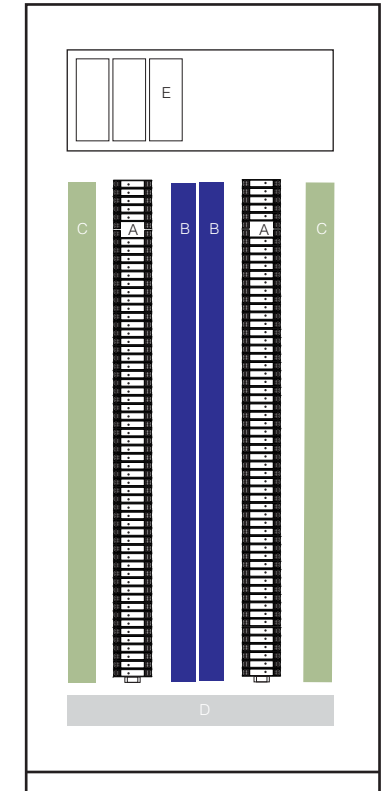
About 700~1000 wire in field side and 1400 wire in system side of each cabinet. Both system side and field side with 4 wiring ducts. Pluggable terminal cross section area of isolated barrier is 0.5mm²~2.5mm². Field signal wire and wire connected to DCS can be directly connected to isolated barrier.

Terminals (Optional)

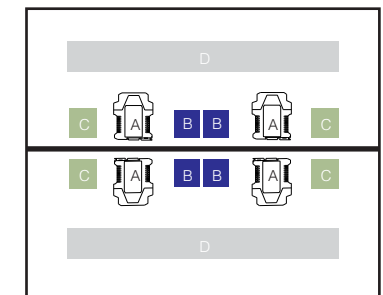
Terminals is a transition connector between isolated barriers and field signal wire, the field signal wire is connected on the terminal, the terminal is connected on the isolated barrier, the isolated barrier arranged according to sequence of I/O card of DCS, isolated barrier connect to DCS wire directly.

Symbol

- A: Isolated barrier
B: Intrinsically safe wiring duct
C: Non-intrinsically safe wiring duct
D: Terminals
E: DCS, I/O card, power supply, etc.



Front view of cabinet



Top view of cabinet

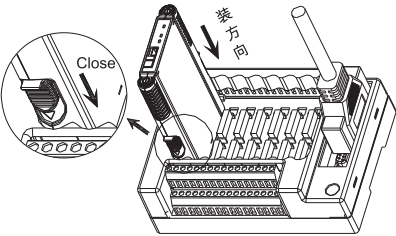
Enclosure of isolated barriers

Installation

AM2000EX series termination board isolated barrier shall be installed in safe area and shall comply with relevant requirements of GB50257-1996、GB3836.15-2010、GB3836.13-2003 and GB3836.16-2006

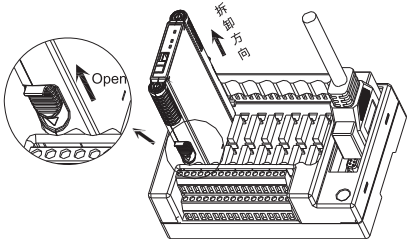
AM2000EX series termination board isolated barriers are used in concert with AM2000EX series termination board, adopts termination board installation. Install as following sequence:

- (1) First make sure both sides of locks are in "Open" state, then insert the instrument along the circular guide groove;
- (2) After confirming the instrument has inserted in the end, lock down and tighten both sides of locks.



Disassembly

- (1) Open up both sides of locks;
- (2) Pull the instrument in the direction of guide groove.



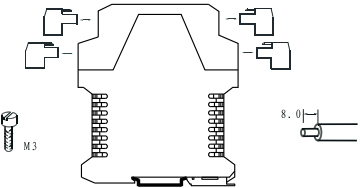
Maintenance

- (1) Before using, must check again whether type and explosion-proof degree of isolated barrier confirms to design and operating environment, whether the wiring and polarity are correct;
- (2) It is forbidden to test insulation among terminals of isolated barrier with a megohm. If necessary, the wiring must be cut off before using, or the internal fuse would blow;
- (3) Every product has been tested strictly before leaving factory, if users find any abnormality in the module, please contact the nearest agent or our company;
- (4) In 5 years from the delivery date, if the product works improperly during normal operation, we will repair or replace it without payment.

AM1000EX series isolated barrier

Wiring of AM1000EX series

- 1) Instruments adopt removable terminals, easy to use. Intrinsically safe terminals(blue) lead to hazardous area, non-intrinsically safe terminals(grey) lead to safe area;
- 2) Copper cross section area of wire is 0.5 ~ 2.5mm², dielectric strength is over 500V;
- 3) Distribution wire of intrinsically safe part and non-intrinsically safe part of isolated barrier shall be laid separately in line duct, each with protective casing;
- 4) A length of 8mm bared wire is locked by M3.



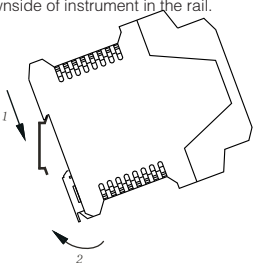
Installation of AM1000EX series

Isolated barriers shall be located at safe area, comply with relevant requirements of standards.

AM1000EX series isolated barriers mounted on DIN35mm guide rail.

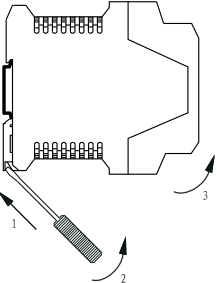
Install as the following sequence:

- 1) Make the upside of instrument locked into the rail;
- 2) Push the downside of instrument in the rail.



Disassembly of AM1000EX series

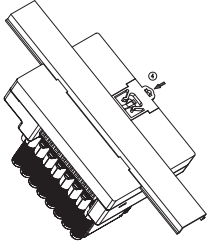
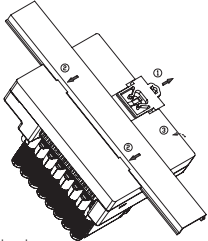
- 1) Insert straight screw into the downside metal lock of instrument;
- 2) Push the screw upwards, then prize the metal lock downwards;
- 3) Pull the instrument out of the guide rail.



AM2000EX series isolated barrier

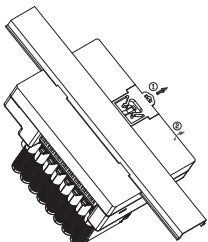
Installation of termination board

- 1) Pull out the bottom rail catch of module with straight screw, make it in the external position;
 - 2) Make the bottom rail card slot of module catch one side of rail, push into the module so that the rail completely placed in the card slot.
 - 3) Push into the rail to catch the other side of rail and fix.
- Install as the following sequence.



Disassembly of termination board

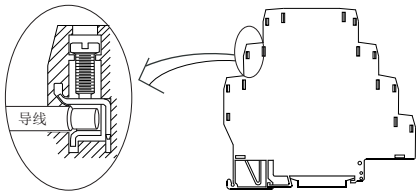
- 1) Pull out the bottom card slot of module with straight screw, make it in the external position;
 - 2) Remove the module from the rail.
- Disassembly as following sequence:



AMG1000 series isolators AML1000 series SPD

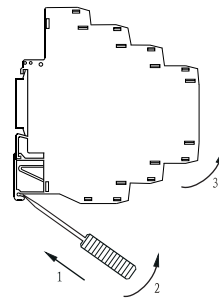
AMG1000 series Wiring of AML1000 series

- 1、Instruments wiring adopt standard M3 screw terminals;
- 2、Adopts cross section area of $1.5 \sim 2.5\text{mm}^2$ cable or single cable;
- 3、A length of 8mm bared wire is locked by M3.



AMG1000 series Disassembly of AML1000 series

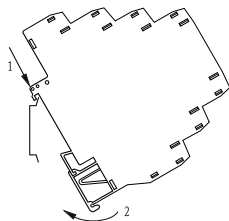
- 1、Insert straight screw into the downside plastic lock of instrument;
- 2、Push upside the screw, leave the metal lock of bottom instrument out guide rail.
- 3、Pull the instrument outside of the rail.



AMG1000 series Installation of AML1000 series

Shall be located at safe area, comply with relevant requirements of standards. Mounted on DIN35mm guide rail. Install as the following sequence:

- 1、Make the upside metal of bottom instrument locked into the rail;
- 2、Push the downside metal of bottom instrument in the rail.



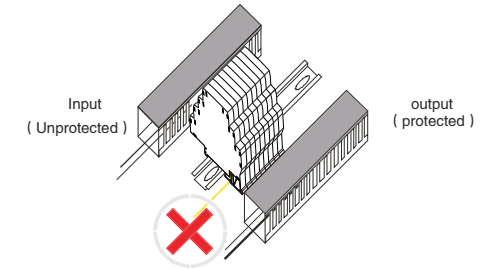
Wiring(Arrangement) of SPD grounding cable

Grounding cable wiring

The grounding terminals of the protected device and the ground terminals of SPD need to be connected and to be grounded through SPD grounding terminals.

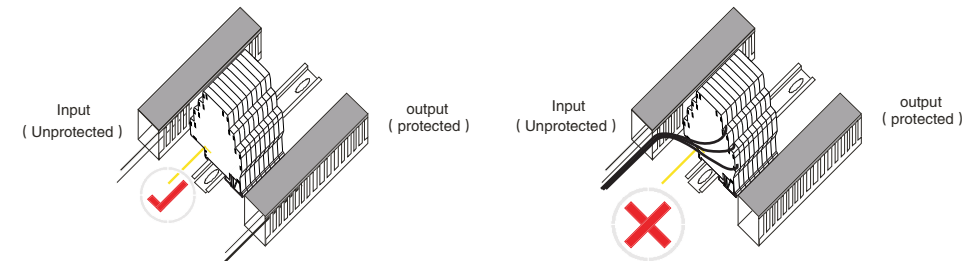
For signal SPDs, a 2.5mm^2 grounding cable is recommended. Grounding through terminals and grounding through DIN rails are both available. For AC power supply SPDs, a backup fuse need to be installed ahead of the SPD. A $4\sim 6\text{mm}^2$ cable should be used to connected SPD and a 6mm^2 cable should be used for grounding.

Incorrect wiring



Grounding cable placed at the protected side

Correct wiring



Grounding cable placed at the unprotected side

Protected cable placed together with the unprotected cable