

Summarize

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: Transmitt 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: 6W615.1144

Products List

AM1000EX Series Isolated Barrier

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

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°C ~ +60°C

Relative humidity: 10% ~ 90%

Storage conditions:

Temperature: -40°C ~ +80°C

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

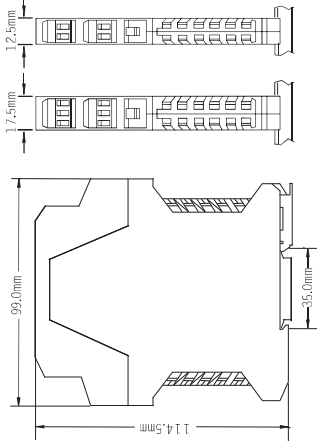


Table 1 Input signal and range list

Type	Range	Min. Span	Accuracy
TC	-200°C ~ +400°C	50°C	0.5% / 0.1%
	-200°C ~ +900°C	50°C	0.5% / 0.1%
	-200°C ~ +1200°C	50°C	0.5% / 0.1%
	-200°C ~ +1372°C	50°C	0.5% / 0.1%
	-200°C ~ +1300°C	50°C	0.5% / 0.1%
	-40°C ~ +1768°C	500°C	1.5% / 0.1%
	-40°C ~ +1768°C	500°C	1.5% / 0.1%
	+320°C ~ +1820°C	500°C	1.5% / 0.1%
	-1.00mV ~ +1.00mV	10mV	20mV / 0.1%
	-200°C ~ +850°C	20°C	0.2% / 0.1%
RTD	0.50	-50°C ~ +150°C	0.2% / 0.1%
	Cu100	-50°C ~ +150°C	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.

2. TC input, transfer accuracy not contain cold junction compensation error, every increase in compensation wire 100Ω, cold junction error increase 0.2°C.

3. TC Type S input, the lower limits of temperature range must be greater than 680°C, to meet the accuracy specifications.

4. mV signal need to be custom lead.

- 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	Switch or NAMUR proximity detector, Frequency ≤ 10Hz
Input signal	≈ 8V
Open circuit voltage	≈ 8mA
Short circuit current	
Safe area output	250V AC/2A or 30V DC/2A, Resistive load
Drive ability	≤ 10ms
Response time	If input > 2.1mA, output relay is energized, with yellow LED ON
Input and output characteristics (Normal phase)	If input < 1.2mA, output relay is de-energized, with yellow LED OFF
Phase reversal	at 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	20 ~ 30V DC
Supply voltage	Reverse Protection
Power supply protection	≤ 30mA (AM1011EX)
Current consumption	≤ 40mA (AM1012EX, AM1013EX)
Gal. 24Vdc supply, output energized)	2500V AC/1min., 500V AC/1min
Dielectric strength(Non IS- IS; Power-Non IS)	680T 18268 (IEC 61326-1)
EMC	Ambient temperature
EMC	-20°C ~ +60°C
Ambient temperature	Switch or 30V 19234 standard NAMUR proximity detector input field devices(including intrinsically safe
Suitable IS apparatus and suitable location	Type pressure switch, temperature switch and liquid level switch; Zone 0/1/2, II/II B/ II C, I/1-16 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 Gaj II C

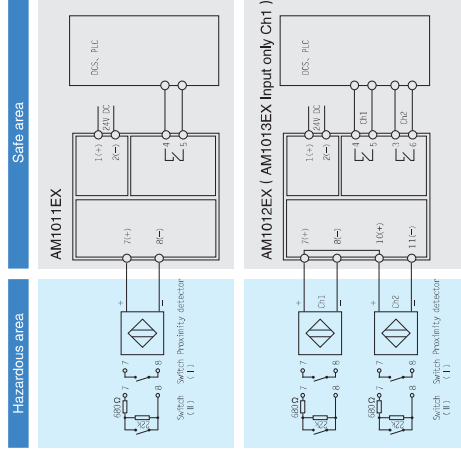
Maximum voltage (Um) : 250V

Intrinsic safety parameter:

- Terminals (between 7, 8), (between 10, 11)
- U=10.5V, I=1.4mA, P=37mW
- II C: C=2.4μF, L=1.65mH
- II B: C=1.6.8μF, L=495mH
- II A: C=75.0μF, L=1000mH

Hazardous area output	Switch or NAMUR proximity detector, Frequency ≤ 10Hz
Open circuit voltage	≈ 8V
Short circuit current	≈ 8mA
Safe area output	250V AC/2A or 30V DC/2A, Resistive load
Drive ability	≤ 10ms
Response time	If input > 2.1mA, output relay is energized, with yellow LED ON
Input and output characteristics (Normal phase)	If input < 1.2mA, output relay is de-energized, with yellow LED OFF
Phase reversal	at 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	20 ~ 30V DC
Supply voltage	Reverse Protection
Power supply protection	≤ 30mA (AM1011EX)
Current consumption	≤ 40mA (AM1012EX, AM1013EX)
Gal. 24Vdc supply, output energized)	2500V AC/1min., 500V AC/1min
Dielectric strength(Non IS- IS; Power-Non IS)	680T 18268 (IEC 61326-1)
EMC	Ambient temperature
EMC	-20°C ~ +60°C
Ambient temperature	Switch or 30V 19234 standard NAMUR proximity detector input field devices(including intrinsically safe
Suitable IS apparatus and suitable location	Type pressure switch, temperature switch and liquid level switch; Zone 0/1/2, II/II B/ II C, I/1-16 hazardous area

Application



Certificate

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

Ex-marking: [Ex ia Gaj II C

Maximum voltage (Um) : 250V

Intrinsic safety parameter:

- Terminals (between 7, 8), (between 10, 11)
- U=25V, I=1.40mA, P=87.5mW
- II C: C=0.11μF, L=1.32mH
- II B: C=0.84μF, L=3.96mH
- II A: C=2.97μF, L=10.56mH

Hazardous area output	Switch or NAMUR proximity detector, Frequency ≤ 10Hz
Open circuit voltage	≈ 8V
Short circuit current	≈ 8mA
Safe area input	Switch or NAMUR proximity detector, Frequency ≤ 10Hz
Open circuit voltage	≈ 8V
Short circuit current	≈ 8mA
General parameter	20 ~ 30V DC
Supply voltage	Reverse Protection
Power supply protection	≤ 30mA (AM1012EX)
Current consumption(at 24V supply, 45mA output)	≤ 20ms
Response time	2500V AC/1min
Dielectric strength(Non IS part-IS part)	680T 18268 (IEC 61326-1)
EMC	Ambient temperature
EMC	-20°C ~ +60°C
Ambient temperature	Suitable IS apparatus and suitable location
Suitable IS apparatus and suitable location	Zone 0/1/2, II A/II B/II C, I/4 ~ 16 hazardous area

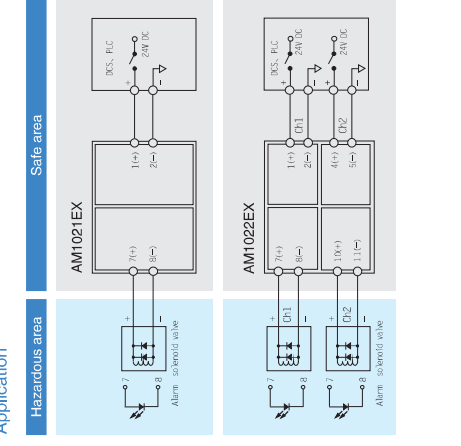
Structure and Dimensions

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



Hazardous area output	Switch or NAMUR proximity detector, Frequency ≤ 10Hz
Open circuit voltage	≈ 8V
Short circuit current	≈ 8mA
Safe area input	Switch or NAMUR proximity detector, Frequency ≤ 10Hz
Open circuit voltage	≈ 8V
Short circuit current	≈ 8mA
General parameter	20 ~ 30V DC
Supply voltage	Reverse Protection
Power supply protection	≤ 30mA (AM1021EX)
Current consumption(at 24V supply, 45mA output)	≤ 20ms
Response time	2500V AC/1min
Dielectric strength(Non IS part-IS part)	680T 18268 (IEC 61326-1)
EMC	Ambient temperature
EMC	-20°C ~ +60°C
Ambient temperature	Suitable IS apparatus and suitable location
Suitable IS apparatus and suitable location	Zone 0/1/2, II A/II B/II C, I/4 ~ 16 hazardous area

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	0/4~20mA, HART
Input signal	≤28V
Open circuit voltage	≥15.5V
Distribution voltage at 20mA	(Voltage or current output should be specified when ordering)
Safe area output	0/4~20mA, HART
Output current	R _L ≤ 300Ω (AM1031EX); R _L ≤ 300Ω (AM1032EX)
Load resistance	R _L ≥ 250Ω
Output voltage	0/4~20mA, HART
Load resistance	R _L ≥ 300Ω
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)	0.006%F.S./°C
Dielectric strength(Non IS; Power-Non IS)	2500V AC1min; 500V AC1min
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, I A-16 hazardous area

Structure and Dimensions

AM1031EX: 11.4.5mm × 99.0mm × 12.5mm
AM1032EX: 11.4.5mm × 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 (U_m): 250V

Intrinsic safety parameter:

Terminals (Among 7, 8, 9)

U_i=28V, I_i=93mA, P_i=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

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	0/4~20mA, HART
Output current	R _L ≤ 800Ω
Load resistance	R _L ≥ 250Ω
Output voltage	0/4~20mA, HART
Load resistance	R _L ≥ 300Ω
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; Power-Non IS)	2500V AC1min; 500V AC1min
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, I A-16 hazardous area

Structure and Dimensions

AM1041EX: 11.4.5mm × 99.0mm × 12.5mm



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_i=28V, I_i=93mA, P_i=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

Application

Hazardous area

Safe area

AM1041EX

Wired positioner
Electric converter

DCS, PLC

24V DC

1(+)

2(-)

4(+)

5(-)

7(+)

8(-)

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	(Signal type and range should be specified when ordering or self programming)
Input signal	See table 1 in P1
Safe area output	(Voltage or current output should be specified when ordering)
Output current	0/4~20mA
Load resistance	R _L ≤300Ω
Output voltage	0/1~5V
Load resistance	R _L ≥20KΩ
Alarm directions	Lower than range, LED L flashing, output current≈3.8mA. Higher than range, LED H flashing, output current≈20.8mA. Breakage, LED L and H flashing at the same time, output current≈20.8mA
General parameter	
Supply voltage	20~35V DC
Power supply protection	Reverse protection
Current consumption(at 24V supply, 20mA output)	≤35mA (AM1051EX) ; ≤55mA (AM1052EX)
Response time	Reach 90% of final value in 1s
Cold junction compensation	See table 1 in P1 (Cold junction compensation error not included)
Temperature drift	±0.1% (Compensation range: -20℃~+60℃)
Dielectric strength(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	TC including I, F, J, K, N, R, S, B, mV signal sensor; Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Structure and Dimensions

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



Certificate

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

Ex-marking: [Ex ia Gaj II C

Maximum voltage (Um) : 250V

Intrinsic safety parameter:

Terminals (Among 7, 8, 9)

U=8.5V, I=20mA, P=4.3mW

II C: C=6.5μF, L=3.6mH

II B: C=60μF, L=10.8mH

II A: C=1000μF, L=28.8mH

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 area 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	(Signal type and range should be specified when ordering or self programming)
Input signal	See table 1 in P1
Safe area output	(Voltage or current output should be specified when ordering)
Output current	0/4~20mA
Load resistance	R _L ≤300Ω
Output voltage	0/1~5V
Load resistance	R _L ≥20KΩ
Alarm directions	Lower than range, LED L flashing, output current≈3.8mA. Higher than range, LED H flashing, output current≈20.8mA. Breakage, LED L and H flashing at the same time, output current≈20.8mA. Short circuit, LED L and H flashing at the same time, current≈3mA.
General parameter	
Supply voltage	20~35V DC
Power supply protection	Reverse protection
Current consumption(at 24V supply, 20mA output)	≤35mA (AM1061EX) ; ≤55mA (AM1062EX)
Response time	Reach 90% of final value in 1s
Transfer accuracy	See table 1 in P1
Temperature drift	0.01% / S, 1℃
Dielectric strength(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	2-wire/3-wire RTD; Zone 0/1/2, II A/II B/II C, T4~T6 hazardous area

Structure and Dimensions

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



Certificate

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

Ex-marking: [Ex ia Gaj II C

Maximum voltage (Um) : 250V

Intrinsic safety parameter:

Terminals (Among 7, 8, 9)

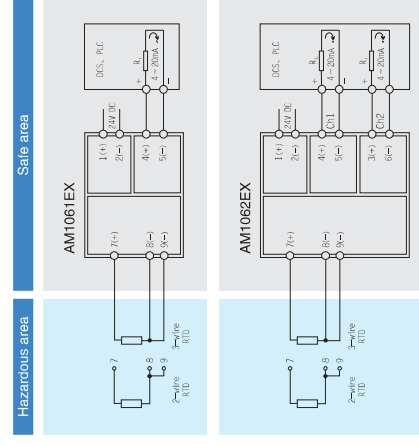
U=8.5V, I=20mA, P=4.3mW

II C: C=6.5μF, L=3.6mH

II B: C=60μF, L=10.8mH

II A: C=1000μF, L=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 8 & 9 must be shorted.