MORNSUN®

Switch Output isolation safety barrier
—— TSFX02-EX Series

FEATURES
- 2-port electrical isolation between input and output
- Isolation voltage (Intrinsically safe and no-intrinsically safe:2.5KVAC/60S)
- High reliability(MTBF>500,000 hours)
- Protect: power reverse protect
- Operating temperature range:-25 ~ +71℃
- Excellent EMC performance

PART NUMBER SYSTEM
TSF202-EX

- Safety barrier mark
- Channel configuration
- Channel number
- Signal flow
- Signal style
- Isolation transducer

GENERAL DESCRIPTION
The switch output safety barriers, with electrical isolation, which enable a device located in the hazardous area to be controlled from the safe area. The series drive power is 12V/44mA, which is suitable for driving the devices such as electromagnetic valve. Sound and light alarm and so on.

SELECTION GUIDE

TSF	x	02	-EX	Description
Channels	1			1 input 1 output
	2			2 input 2 output
Explosion Protection			EX	Safety Barrier Explosion protection mark

ELECTRICAL CHARACTERISTICS

Safe Area	Input signal	Dry contact input
	Power supply voltage	24VDC
	Power supply voltage range	18~30VDC
Hazardous Area	Open status voltage	24VDC±5%
	Output voltage (current 44mA)	≥12VDC
	Driving capability	12VDC/44mA
	Recovery time	≤5ms
Protection	Power reverse protection	

ISOLATION CHARACTERISTICS

Electrical Isolation	Between intrinsically safe and no-intrinsically safe
Isolation Strength	Between intrinsically safe and no-intrinsically safe: 2.5KVAC/60s
Isolation Resistance	Between intrinsically safe and no-intrinsically safe: ≥100MΩ, 500VDC
Test Conditions: testing for 1minute, humidity < 70%, leakage current < 1mA	

EMC CHARACTERISTICS

EMI	CE	CISPR22/EN55022 CLASS A		
	RE	CISPR22/EN55022 CLASS A		
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV /Air±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3	3V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	Power Port ±2KV	perf. Criteria B
		IEC/EN61000-4-4	Signal Port ±1KV	perf. Criteria B
	Surge	IEC/EN61000-4-5	Power Port±1KV /±2KV	perf.Criteria B
		IEC/EN61000-4-5	Signal Port ±1KV（line to GND）	perf. Criteria B
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A

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STANDARDS & CERTIFICATES

Explosion protection certificate mark	[Exia]IIC
Explosion protection certificate parameters	Pin（9+, 10-）; （11+, 12-） Uo: 26.25VDC Io: 153.5mA Um: 250V Po: 1.01W Co: 0.345uF Lo: 2mH
Explosion protection certificate agency	CHINA NATIONAL QUALITY SUPERVISION AND TEST CENTRE FOR EXPLOSION PROTECTED ELECTRICAL PRODUCTS
Explosion qualified No.	CNEx 12.2417

OTHER CHARACTERISTICS

Ambient temperature	Operating temperature：-25~+71℃
	Transport and Storage temperature: - 50 ~ +105°C
Package	35mm DIN-rail package：T-rail card package (DIN50022), pluggable connection terminal, Plastic UL94-V0
Safety class	IP20(IEC60529 / EN60529)
Weight	1 input 1 output about100g: 1 input 2 output and 2 input 2 output about 128g
Consume current	≤160mA
Hot swap	Support
Size	99.5×111×22.5（L×H×W mm）

CONNECTION

1. Removable terminal;
2. Cross section area of wiring: 0.5mm^2 ~2.5mm^2;
3. The length of bare wire is about 8mm, locked up by the M3 bolt.

Selection guidelines for intrinsically safety explosion protection system

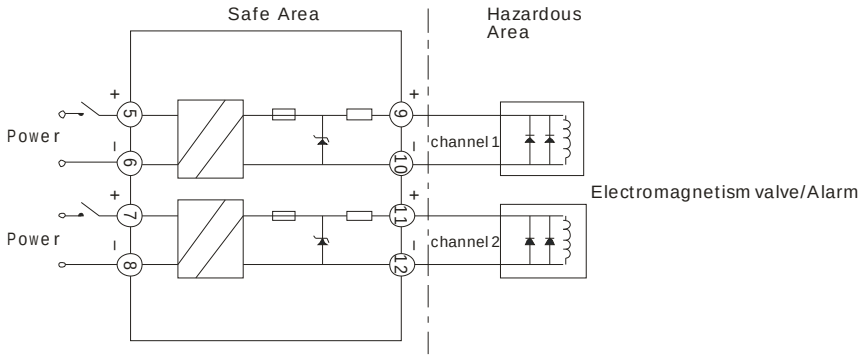
1. The explosion protection grade of the barrier must be not less than that of intrinsically safety explosion protection device in spot.
2. Take inconsideration of hazardous end output resistance and loop resistance make sure the barrier output voltage meets the minimum operation voltage requirement of intrinsically safety device in spot.
3. The safety parameters about intrinsically safety end meets:
   Uo ≤ UI, Io ≤ Iin, Po ≤ Pin
   Co ≥ Cin, Lo ≥ Lin
4. Select suitable safety barrier which matches the intrinsically safety device in spot according to the power polarity, signal type and transmission mode about the device.
5. The wires leading to the dangerous places should use the blue safety wire, wire soft copper area must be greater than 0.5mm^2, dielectric strength should be greater than 500VDC

Operation notes

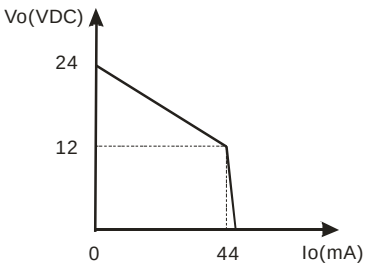
1. Please read the user manual carefully before using. If any question, please contact our technical support department.
2. Please don't use this product in hazardous area.
3. The power supply of this product should be 24VDC power source. It is forbidden to use 220VAC power supply.
4. To avoid void of explosion proof, or any failure, users disassemble this product is forbidden.

APPLICATION CIRCUIT DIAGRAM

2 input 2 output



OUTPUT TYPICAL CURVE



Note:
This diagram is for 2 input & 2 output model only, 1 input & 1 output model connect channel 1 only.

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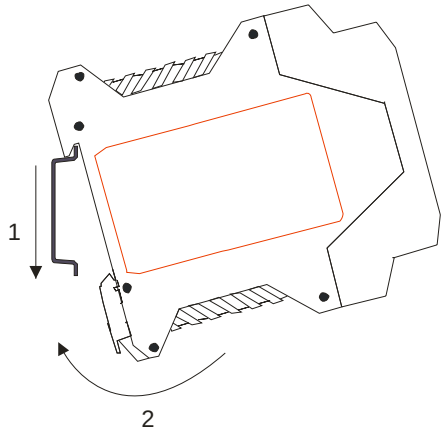
INSTALLATION & DISASSEMBLY

Installation

DIN35mm standard rail installation:

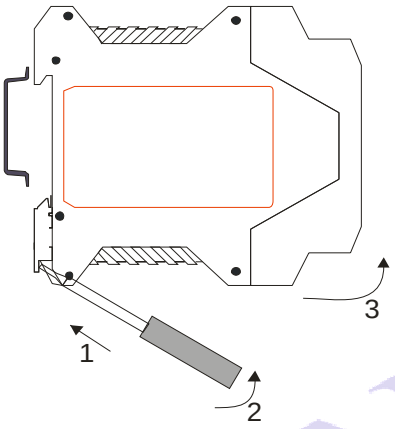
1.Insert the top of the instrument card in the rail;

2.Push the bottom of the instrument into the rail.



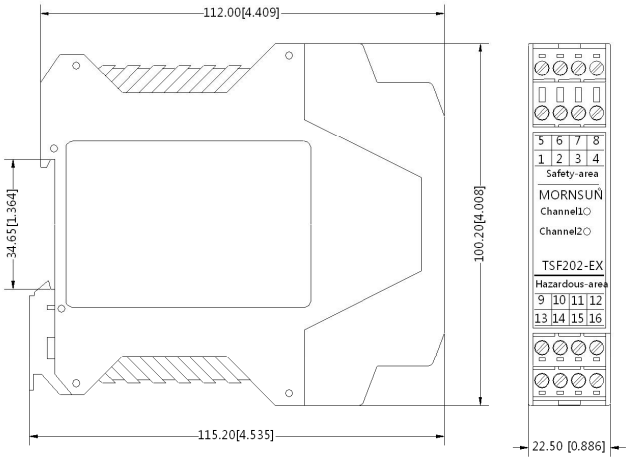
Disassembly

1. Insert a screwdriver between the bottom of the metal card lock and the rail;
2. Pull up the screwdriver and press the card lock downwards;
3. Pull the instrument out of the rail.



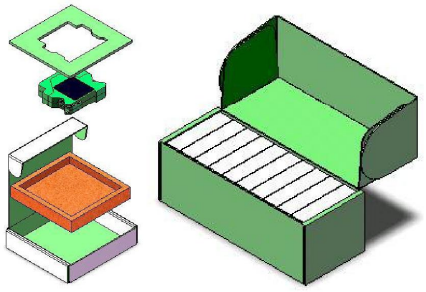
PACKAGING DIMENSION & PACKAGING DIAGRAM

MECHANICAL DIMENSIONS



Note:
Unit:mm[inch]
Wire range : 28-12 AWG
General tolerances:±1.00[±0.039]

PACKAGE DIAGRAM



Note :
Unit:mm[inch]
Small white box:L*W*H=165*155*40
Packaging quantity: 1pcs
Inner carton:L*W*H=425*175*160
Packaging quantity: 10 pcs
Outer carton:L*W*H=560*450*520
Packaging quantity: 90pcs

Note:

1. All specifications are measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. In this datasheet, all the test setup and methods are based on our corporate standards.
3. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more details.
4. Please contact our technical support for any specific requirement.
5. Specifications of this product are subject to changes without prior notice.

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