

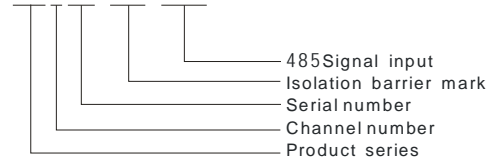
# MORNSUN®

## DETECTION SAFETY BARRIER RS485 INPUT RS485 OUTPUT (HALF-DUPLEX)

—TD100-EX-485-xx Series



### PART NUMBER SYSTEM



### FEATURES

- I Three-port isolation (input, output and power supply)
- I High isolation voltage (2500VAC/60S)
- I High reliability (MTBF>500,000 hours)

### GENERAL DESCRIPTION

TD-EX detection side isolated safety barrier, It can supply isolated DC power of the transmitters from the security zone to the danger zone, transform the RS-485 digital signal of danger zone into isolated RS-485 digital signal transmission to the security zone, while increasing the anti-jamming capability of the industrial production process control system, to ensure system stability and reliability. It meets IEC/EN61326 standards.

One independent power supply is required. Moreover, within the product power supply, input and output are mutually isolated. Field devices connected with this product: RS-485 bus

### SELECTION GUIDE

Power	Power Supply	18~32VDC (Typ. :24VDC)
	Power Dissipation	About 2.8W
	Power Protection	Reverse protection
Hazardous Area	Input signal: RS-485 Half-duplex digital signal	
	On-site power supply: 5V, 6V: I≤100mA 8V, 9V: I≤50mA	
Safe Area	RS-485 Half-duplex digital signal	

### SIGNAL CHARACTERISTICS

RS-485	Signal level rules: Standard RS-485 differential level Transmission delay: ≤10μS Signal transmission rate: ≤56kbps
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### ISOLATION CHARACTERISTICS

Galvanic Isolation	intrinsically safe end and non-intrinsically safe end 2500VAC 1Min
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### EMC CHARACTERISTICS

EMI	RE	CISPR22/EN55022 CLASS A	
	CE	CISPR22/EN55022 CLASS A	
EMS	ESD	IEC/EN61000-4-2 Air ±6KV/Contact ±4KV	perf. Criteria B
	RS	IEC/EN61000-4-3 3V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±1KV	perf. Criteria B
	Surge	IEC/EN61000-4-5 DC Power port ±1KV /±2KV	perf. Criteria B
		I/O Signal port ±1KV(PE)	perf. Criteria B
CS	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A	

### OTHER CHARACTERISTICS

Signal Indicator	Green: Power, lighting at power on.
	Yellow: Send Indicator, safety side lights when data is sending.
	Red: Receive Indicator, safety side lights when data is receiving.

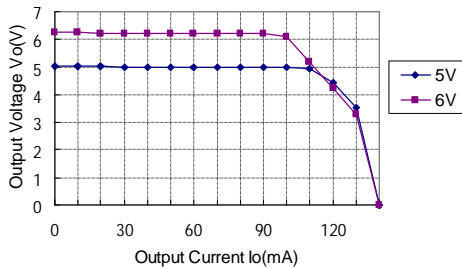
Ambient Temperature	Operation temperature: -25°C ~ +71°C
	Transport and storage temperature: -50°C ~ +105°C
Field Devices Connected and Regions	Equipment with RS-485 communication interface Zone 0, Zone 1, Zone 2, II A, II B, II C, T4~T6 danger zone
Package	35mm DIN-rail package: pluggable connection pin, thickness 22.5mm, Plastic UL94-V0
Safety Class	IP20(IEC60529 / EN60529)
Weight	about 150g

## EXPLOSION PROTECTION

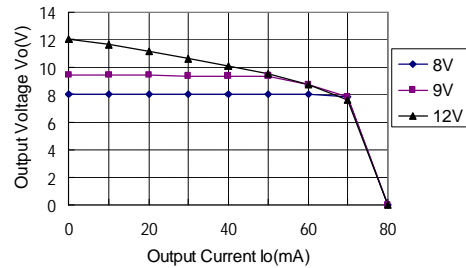
Explosion Protection Mark	[Exia Ga] II C
Certification Parameters	Between the pin 9 and 10 $U_o=11.2\text{ V}$ , $I_o=111\text{ mA}$ , $P_o=0.31\text{ W}$ , $U_m=250\text{ V}$ $C_o=1.2\mu\text{F}$ , $L_o=2\text{ mH}$
	Between the pin 11 and 12 $U_o=12.6\text{ V}$ , $I_o=306\text{ mA}$ , $P_o=0.96\text{ mW}$ , $U_m=250\text{ V}$ $C_o=0.7\mu\text{F}$ , $L_o=0.21\text{ mH}$
Explosion protection certificate agency	NATIONAL QUALITY SUPERVISION AND TEST CENTRE FOR EXPLOSION PROTECTED ELECTRICAL PRODUCTS
Explosion qualified NO.	CNEx11.2587

## ISOLATION POWER OUTPUT CURVE

5V/6V Isolation power output curve



8V/9V/12V Isolation power output curve



## APPLICATION

### Connection

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

### Application in intrinsically safe explosion protection system

In intrinsically safe explosion protection systems, isolating barrier belongs to affiliated device. It is installed at safe area, as a connection between intrinsically safe devices in the hazardous area and non-intrinsically safe devices in the safe area. By limiting the energy to a certain safe threshold, it ensures the safety of field devices and people.

### Selection guidelines for intrinsically safe explosion protection system

1. The explosion protection grade of the barrier must be not less than that of intrinsically safe 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 safe device in spot.
3. The safety parameters about intrinsically safe end meets:
  - $U_o \leq U_I$ ,  $I_o \leq I_{in}$ ,  $P_o \leq P_{in}$
  - $C_o \geq C_{in}$ ,  $L_o \geq L_{in}$
4. Select suitable safety barrier which matches the intrinsically safe device in spot according to the power polarity, signal type and transmission mode about the device.
5. Much more protection is required, which can avoid the influence of the leakage current generated by safety barrier on intrinsically safe device in spot.
6. The wires leading to dangerous field should be constrained in blue intrinsically safe wires, and its copper cross-section should be more than 0.5mm<sup>2</sup>; Insulation intensity should be more than 500VDC.

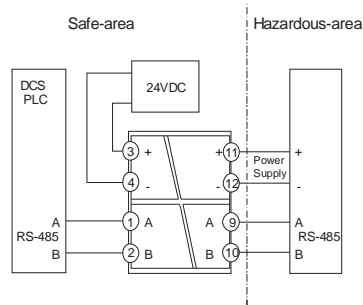
### Operation notes

1. Please read the user manual carefully before using. If any question please contact our technical support department.
2. Please do not 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 invalid explosion protection function, or any failure, users disassemble this product is forbidden.

### After service

1. Products are carefully inspected and controlled before going out from our factory. If they operated abnormally or there were anything wrong in the inner parts, please contact with our agents near you or technical support in our company as soon as possible.
2. 3 years warranty since the delivery date. During the period of quality guarantee, our company will repair or change free of charge if product has any quality problem in the process of normally using.

## APPLICATION CIRCUIT DIAGRAM

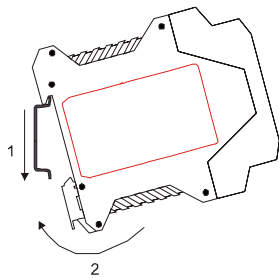


## INSTALLATION & DISASSEMBLY

### Installation

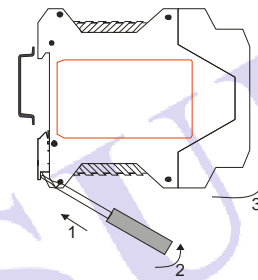
DIN35mm standard rail installation:

1. Insert the top of the instrument card in the rail;
2. Push the bottom of the instrument into the rail.

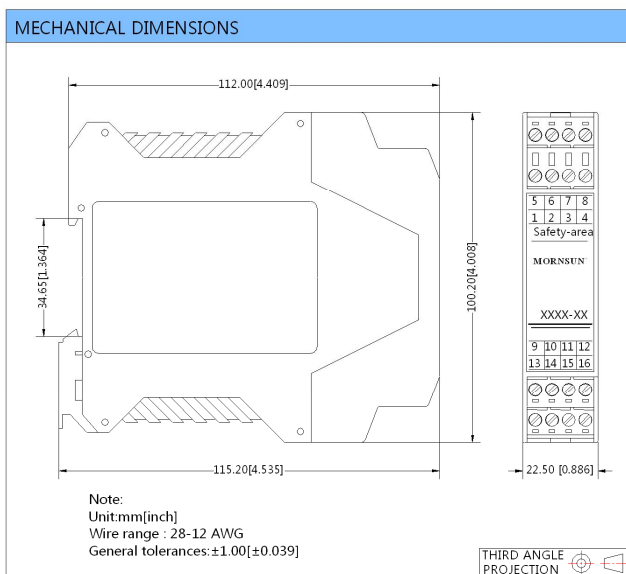


### Disassembly

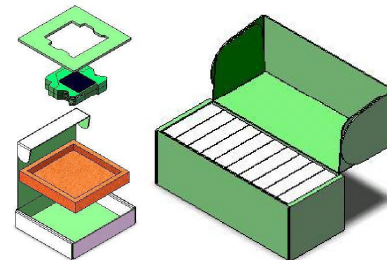
1. Insert a screwdriver between the bottom of the card lock and the rail;
2. Pull up the screwdriver and press the card lock downwards;
3. Pull the instrument out of the rail.



## PACKAGING DIMENSION & PACKAGING DIAGRAM



### 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  $T_a=25^{\circ}\text{C}$ , 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 meant for listed model, non-standard models may perform differently, you can contact MORNSUN FAE for more details.
4. Contact us for your specific requirement.
5. Specifications are subject to change without prior notice.

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