

TXX2 Explosion-proof Safety Barrier Operations Manual



ATEX II (1) G [Ex ia Ga] IIC
 II (1) D [Ex ia Da] IIIC
 IECEx [Ex ia Ga] IIC
 [Ex ia Da] IIIC

WORKING PRINCIPLE

The barrier is provided to isolate the power supply of a transmitter in a hazardous area, as well as transmit analog signal and digital signal generated by the transmitter to the safe side. The analog 4~20mA output signal can be converted into a 4~20mA isolated type. Moreover, it can read the HART digital signal or RS485 signal in the hazardous side, and isolates the digital output signal to the safe side.

FEATURES

- Wide input voltage range
- Integrated power supply safety barrier and digital communication safety barrier
- Insulation withstand voltage of up to 2500V R in hazardous and safe sides
- RS485 repeater mode for safety digital communication
- HART repeater mode for safety digital communication
- Internal 250 Ohm for HART communication
- Power supply indicator and digital communication indicator
- Intrinsically safe explosion-proof IECEx/ATEX

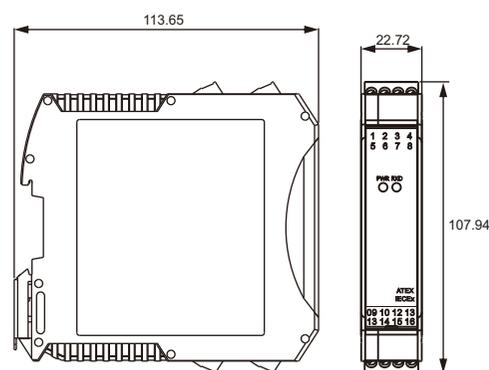
SPECIFICATIONS

Hazardous side	
Input Current	4~20mA or 20~4mA
Voltage	<35 Vdc
Digital output	HART/RS485

Safe side	
Supply voltage	20~35Vdc
Power consumption	4W
Analog output	4~20 mA (active), Load impedance <500Ω
Digital output	HART 7.3(Internal 250Ω communication resistance) RS485

Technical parameters	
Accuracy	0.1% F.S(20°C) <2.0uA / °C(25°C~60°C) <3.0uA / °C(-20°C~25°C)
Ambient temperature	-20~60°C
Insulation strength	2500Vac; Leakage current <1mA; 1min, Hazardous side and safe side
IP grade	IP20
Application environment	Zone 0, Zone 1, Zone 2 · IIA · IIB/IIIC · IIC
Certification (Optional)	IECEx/ATEX

DIMENSION



OPERATING ENVIRONMENT

The working environment must not be subjected to strong vibration, impact, high current or sparks and other forms similar to electromagnetic induction. The ambient air must not contain Cr, Ni and layers of silver coating or any form of corrosive substance, as well as flammable and explosive materials.

PRECAUTIONS FOR USING THE PRODUCT

Before using the intrinsically safe explosion-proof loop system with safety barrier and intrinsically safe field meter, check the following:

1. The explosion-proof level of the intrinsically safe field meter must comply with operating environment requirements. Moreover, it should be certified by an authorized agency and issued an explosion protection certificate.
2. The certification parameters of the safety barrier and intrinsically safe field meter should be clear and must adhere to the standards listed below.

Terminal no. 4-3/5 (Supply voltage) : Un=20~35Vdc

Terminal no. 2-1 (RS485 power) :

Maximum input voltage Ui(V)	Maximum input current Ii (mA)	Maximum input power Pi (mW)	Max. internal equivalent parameter	
			Ci (μF)	Li (mH)
8.5	90	192	0	0

Terminal no. 10-12 (RS485 signal) :

Maximum output voltage Uo (V)	Maximum output current Io (mA)	Maximum output power Po (mW)	Maximum external parameter	
			Co (μF)	Lo (mH)
5.88	19.8	29.11	20	10

Terminal no. 13(HART Signal input) : Ii=4~20mA

Terminal no. 15-14/16 (Sensor signal) :

Maximum output voltage Uo (V)	Maximum output current Io (mA)	Maximum output power Po (mW)	Maximum external parameter	
			Co (μF)	Lo (mH)
28	93	651	IIC = 0.83 IIB/IIIC = 0.65 IIA = 2.15	IIC = 4.1 IIB/IIIC = 16.3 IIA = 32.6

The parameters of power supply apply when one of the two conditions below is given:

- ♦ The total Li of the external circuit(excluding the cable)is <1% of the Lo value or
- ♦ The total Ci of the external circuit(excluding the cable)is <1% of the Co value.

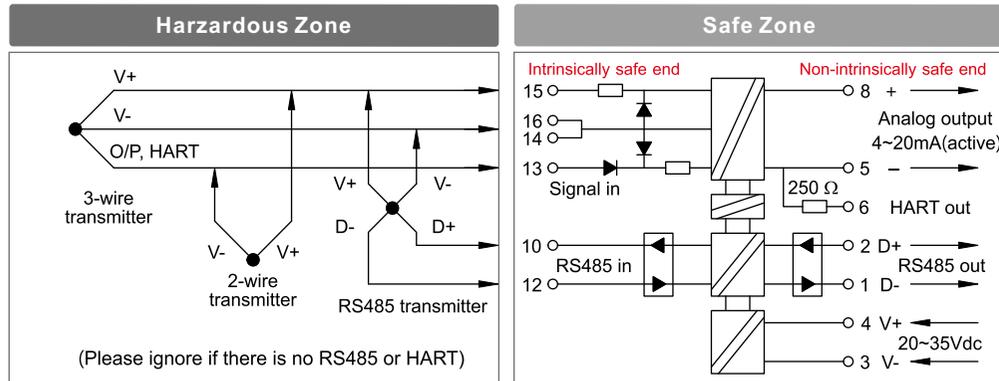
The parameters are reduced to 50% when both of the two conditions below are given:

- ♦ The total Li of the external circuit(excluding the cable)is ≥1% of the Lo value or
- ♦ The total Ci of the external circuit(excluding the cable)is ≥1% of the Co value.

Note: The reduced capacitance of the external circuit (including cable) shall not be greater than 1 μF for IIA & IIB/IIIC and 600nF for IIC.

WIRING

TXX200



TERMINAL DESCRIPTION

Non- intrinsically safe end (toward the safe area)			Intrinsically safe end (toward the hazardous area)		
Code	Definition	Description	Code	Definition	Description
1	RS485,D-	Differential Line for Comm.(-) of RS485 Wiring	15	2-wire sensor power supply V+ 3-wire sensor power supply V+	Maximum open-circuit voltage 28V
2	RS485,D+	Differential Line for Data(+) of RS485 Wiring	13	2-wire sensor power supply V- 3-wire sensor current Input	DC 0V(GND) 3-wire current input mA
3	Power supply GND	Ground wiring(-) for 20-35 VDC	14 or 16	3-wire sensor power supply V-	DC 0V(GND)
4	Power supply V+	Voltage wiring(+) for 20-35 VDC	9	Reserved	Null (Non-used Terminal)
6	HART output	External load resistance 250 Ohm for HART Communication	11	Reserved	
5	HART,GND		10	RS485,D+	Downlink wiring cathode Data+
	Current output-		12	RS485,D-	Downlink wiring cathode Data-
8	Current output+	4~20mA or 20~4mA			

INSTALLATION AND WIRING

1. The safety barrier must be installed in a safe area according to local regulations pertaining to the use of electrical equipment.
2. The safety barrier uses a 35mm DIN rail for installation. During installation, fasten the groove to the upper edge of the pedestal on the guide rail first, then push it downward into the guide rail to finish the installation.
3. Terminal for wiring in which the blue terminal is the signal wire for the intrinsically safe side that goes to the hazardous area. The green terminal is the wiring terminal for the non-intrinsically safe side, which goes to the safe area.
4. The wire of the intrinsically safe side should be the intrinsically safe conductor marked in blue. The cross-sectional area of the annealed copper wire must be greater than 0.5mm², and the insulation strength must be greater than 500V.
5. The wire of the intrinsically safe end and the non-intrinsically safe end must be set up separately in the cable duct, which is equipped with a protective tube.

DAILY MAINTENANCE

1. Before completing the installation of the safety barrier and the connection to the power supply, the model no. and explosion-proof level must be checked whether they match the operating environment, and whether the polarity of the wiring (power supply, communication and transmitter) in the hazardous side and safe side are correct.
2. The user must not modify the internal components of the safety barrier. The explosion-proof labels on the casing of the product must also be checked regularly, so as to prevent damage or loss.
3. When using the safety barrier, the connection in each component must be checked regularly for stability and reliability.

SIMPLE TROUBLESHOOTING

Problem	Cause	Solution
No LED indicator	System has no power	Check and fix the + - polarity of the power line and terminal wiring. Check and switch on the power supply. Check and fix the power supply.
	Damage of safety barrier	Contact the local sales representative.
Power indicator is ON, but there is no signal output.	Open circuit of signal input line	Check and fix the signal input line and pin of the terminal wiring.
	Open circuit of signal output line	Check and fix the + - polarity of the signal output line and the terminal wiring.
	Incompatible input signal and safety barrier	Check if the type of input signal adheres to safety barrier specifications, and make the necessary correction.
LED indicator works normally, but the output value is larger.	Reversed polarity of signal output	Check if the + - polarity of the signal output line is reversed, and make the necessary correction.
	Overloaded output loop	Check whether the impedance of the current output line load exceeds 500Ω, and make the necessary correction.
LED indicator works normally, but the output value is unstable.	Loose wiring terminal and poor connection	Check and secure the input wiring. Check and secure the output wiring..
	Transmitter error	Check the signal fluctuation of the transmitter and fix it.
	Interference of external electric field	Check for electromagnetic fields or high-voltage power lines nearby, and keep the equipment away from them.



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