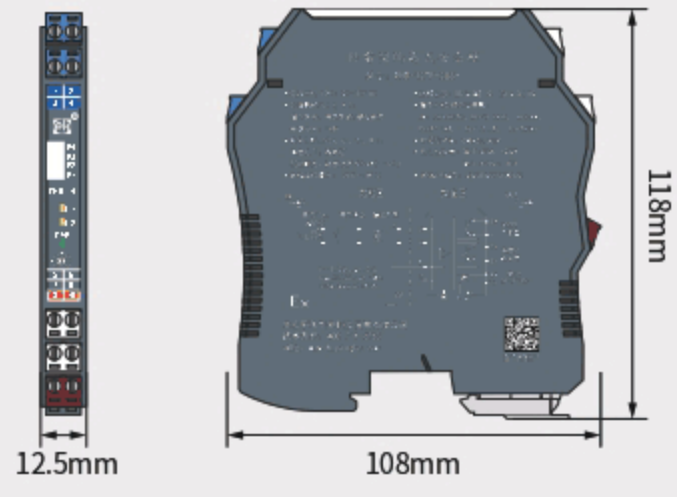
Surge Protection Type Digital Input Isolated Safety Barrier

PHD-12TF-288+

1 input 2 outputs

Input: Switch contacts/proximity switches

Output: Transistor



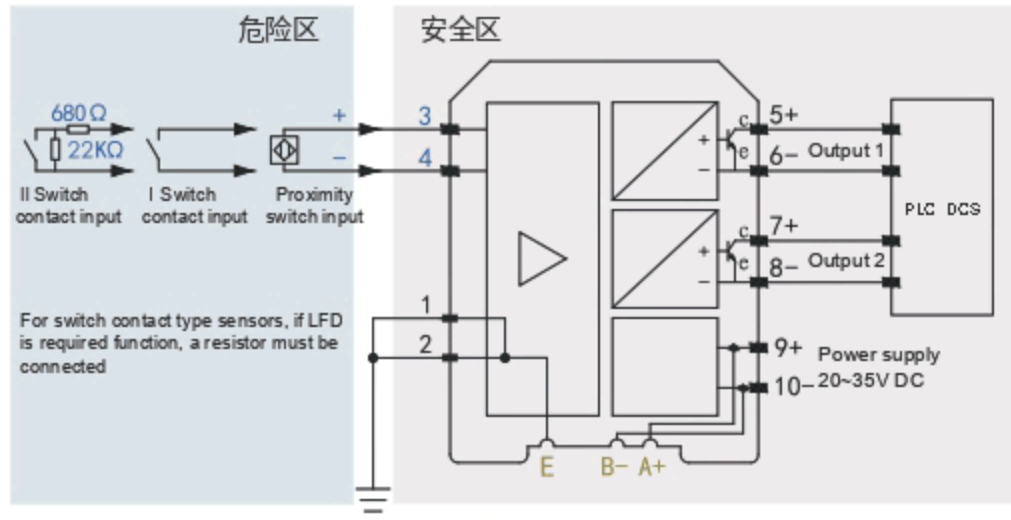
Overview

The isolated safety barrier with surge protection function of switch input transistor output, which isolates and transmits input signals from switch contacts or proximity switches in hazardous areas to of the safety zone with output transistor through the safety barrier. Line fault detection is achieved through LED on the top of the module. The dial switch of the module is used to set input and output in-phase or reverse control, as well as to enable or disable the line fault detection alarm indication function.
This product requires independent power supply, with isolated power supply, input, and output terminals.

Specifications

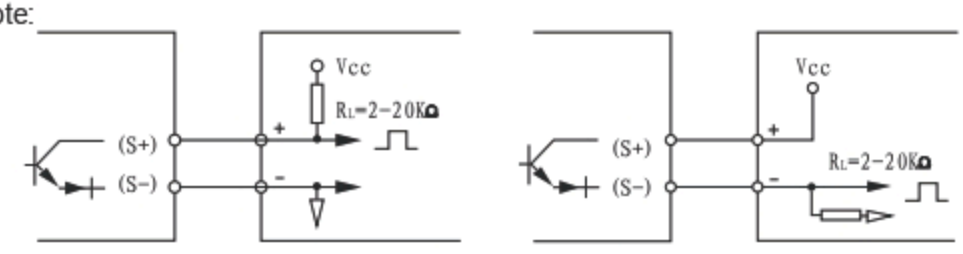
Input in harzadous area:
Input signal: Switch contacts/proximity switches
The supply voltage of the sensor: About 8V
Input frequency range: ≤5kHz
Input/output characteristics:
On site input current: >2.1mA, the output is closed, indicating ON;
When<1.2mA, the output is open circuit, indicating OFF
Switched control between inverted phase and normal phase of outputs e-c: When the dial switch K1,K3 is at "ON", the transistor output e-c are in inverted phase
When the dial switch K1,K3 is at "OFF", the transistor output e-c are in normal phase
When the K2,K4 is at "ON", the circut will select the red light LFD indication alarm function
Output in safe area:
Output signal: Transistor
Output characteristic: NPN type transistor emitter or collector open circuit output
Drive capability: Output current ≤ 20mA (1.2k Ω), maximum internal current 100mA, equipped with short-circuit current protection
Surge protection features:
Nominal discharge current In(8/20μs): 5kA
Voltage protection level Up(8/20μs): 60V(line to line)
Voltage protection level Up(8/20μs): 600V(line to ground)
According to standards: GB/T18802.21-2016
(equivalent to IEC61643-21:2012)
Basic parameters:
Supply voltage: 20~35V DC
Power consumption: <50mA(24V power supply,
when the transistor is conducting)
LED indicator: Green: Power indicator
Yellow: Output relay in normal working state
Red: LFD indication, line fault alarm
Temperature parameters: Working temperature: -20℃ ~ +60℃,
Storage temperature: -40℃ ~ +80℃
Relative humidity: 10%~95% RH no condensation
Insulation strength: Between intrinsically safe side and non-intrinsically safe side (≥3000VAC/min); between power supply and non-intrinsically safe side (≥1500VAC/min)
Insulation resistance: ≥100MΩ (between input/output/power supply)
EMC: According to IEC 61326-1(GB/T 18268), IEC 61326-3-1
MTBF: 100000h
Wire requirements: Horizontal cutting surface ≥0.5mm²;
Insulation strength ≥500W
Applicable field equipments: Field equipment such as dry contacts or NAMUR type proximity switch inputs that comply with DIN19234 standard
Installation place: Installed in a safe zone, it can be connected to intrinsic safety instruments in hazardous areas up to Zone 0, IIC, Zone 20, and IIIC

Schematic diagram



Note: The power supply of the power rail is an optional function. Users need to specify the power supply mode when ordering.
Please refer to attachment on page 89.

Note:



Line Fault Detection (LFD)

Users can select the "ON" side of the switch at the top of the module to enable fault detection function and indicate an alarm through the red LED light. On site input current>7mA, short circuit alarm (SC); On site input current<0.1mA, open circuit alarm (LB). If the switch contact input requires fault detection function (wire breakage, short circuit), a 22k Ω resistor should be connected in parallel at both ends of the switch, and a 680 Ω resistor should be connected in series (as shown in the wiring diagram for switch contact II).

Intrinsically safe certification

Explosion proof mark: [Ex ia Ga] IIC [Ex ia Da] IIIC
Explosion-proof standard: GB/ T 3836.1-2021 GB/T 3836.4-2021
Terminals 3-4 Um：250V AC/DC Uo=10.5V DC Io=15mA
Po=39.4mW Co=1.7μF Lo=165mH
Certification body: CQST(China National Quality Supervision and Test Centre for Explosion Protected Electrical Products)
Shanghai lightning protection products testing center