# MCR-CUBE Transducer

## Dry Contact to Current Transducer

## INTERFACE

Data Sheet
2888_en_A



## 1 Description

The MCR-CUBE limit transducer is a dual-step, current limiter in a highly integrated, compact package. Action is determined by the state of the dry contact, high-impedance input leads. If they are open, the output limits current to 8 mA. If they are closed, the output is limited to 16 mA.

Operating power is derived from the current loop while the voltage drop across the unit is kept to approximately 6 V. While loop voltage is present at the dry contact inputs, they are isolated by a very high value resistance which permits no loop current to flow through the dry contact inputs, thus maintaining contact integrity. The dry contacts and loop input/output lines are protected against transients and RF interference to severity level 3 of IEC 801-3 and level 4 of IEC 801-4.

Operation is allowed from loop voltages of 12 to 26 V DC and is compatible with loads of standard 250 Ω and 500 Ω.

## 2 Applications

- Float switch monitor
- Level sensor
- HVAC
- Dry contact transducer interface
- Bi-metal thermo-elements

Make sure you always use the latest documentation.
It can be downloaded at www.phoenixcontact.net/catalog.

This data sheet is valid for all products listed on the following page:

# 3 Ordering Data

**Products**

| Description | Type | Order No. | Pcs./Pkt. |
|---|---|---|---|
| Transducer, dry contact current loop | MCR-CUBE | 5521393 | 1 |

# 4 Technical Data

| General Data | |
|---|---|
| Current limiting | |
| Dry contacts open | 8 mA |
| Dry contacts closed | 16 mA |
| Operating temperature | -20°C… 85°C |
| Error | ±2% |
| Material | Dow Corning® 3112 |
| Termination wire size | 18 AWG |
| IEC 801-3 severity level | 3 |
| IEC 801-4 severity level | 4 |

| Input Data | |
|---|---|
| Input type | Dry contact, switching |
| Maximum input current/voltage | <360 µA |
| Input resistance | >100 kΩ |

| Output Data | |
|---|---|
| Supply voltage | 12… 36 V DC |
| Lead/line resistance or burden | ≤1000 Ω |
| Output signal | 8/16 mA |

# 5 Function Diagram

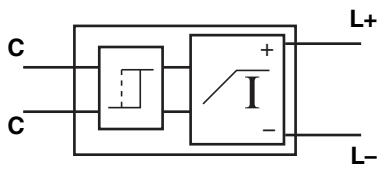


Figure 1 Function diagram

# 6 Applications

## 6.1 Tank level monitoring

As the tank is filled, the level switch closes on rising level. When level drops, the level switch opens.

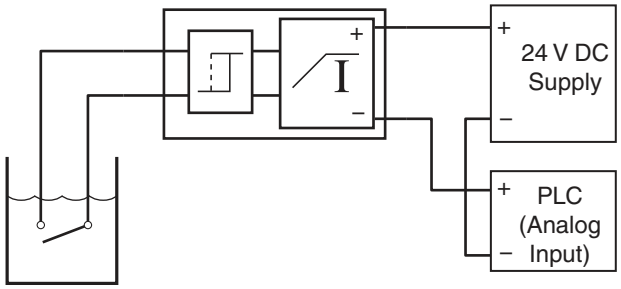


Figure 2 Typical tank schematic

As the switch in the tank opens and closes, the pump is activated and deactivated.

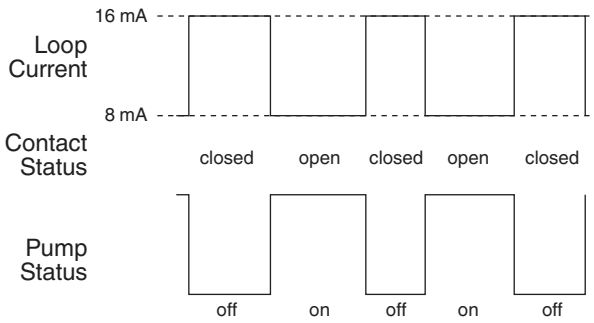


Figure 3 Contact action vs. pump status

## 6.2 Over-pressure Sensor

Over-pressure sensors on tanks are often composed of conductive strips on a plate which blows out when a tank is dangerously over-pressurized. A resistance of several hundred ohms is compatible with the contacts and results in a 16 mA current until the sensor ruptures, causing the current to drop to 8 mA.

By including a 1000 Ω resistor on the current loop, logic levels of 16 V and 8 V are provided, which exceed the typical 12-14 V threshold of 24 V logic.

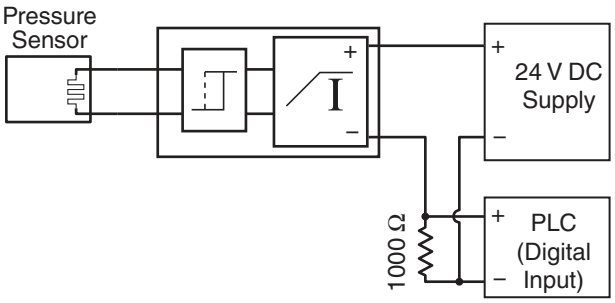


Figure 4 Typical over-pressure sensor schematic

## 6.3 Over-temperature Sensor

Thermostatic contacts can provide reliable over-temperature indication for protective systems, but at the expense of high-resistance contacts. This is overcome by the MCR-CUBE, which lets through 8 mA until the contacts close, at which time the current increases to 16 mA. Standard analog input resistances of 50, 250 or 500 Ω are compatible with the loop. The MCR-CUBE is also resistant to interference generated by commercial two-way radio systems commonly found in industrial environments.

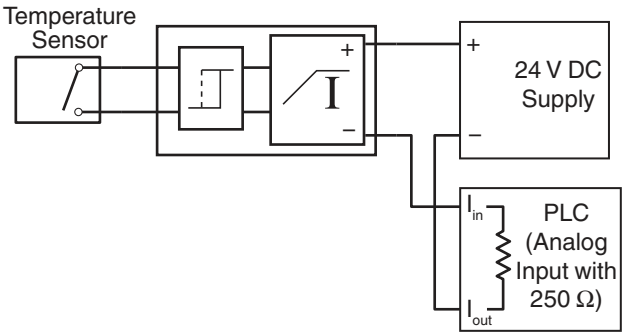


Figure 5 Typical over-temperature sensor schematic