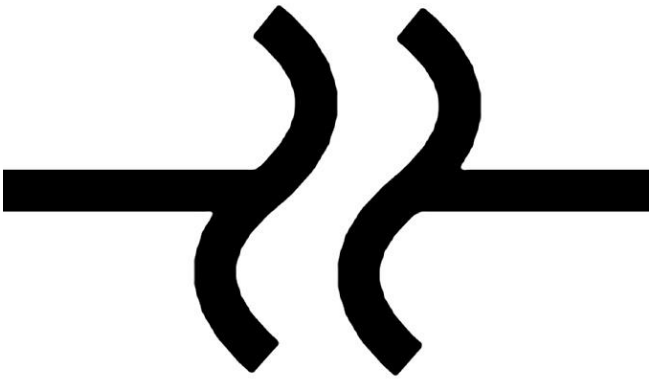
Technical Information



Galvanic Isolation

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V0

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1 Introduction

Amperometric sensors measure currents that are proportional to the concentration of a specific chemical substance. These sensors are frequently used in industrial analytics and environmental monitoring. Galvanic isolation is a method which ensures that there is no direct electrical contact between different circuits. In systems with amperometric sensors galvanic isolation is especially important to prevent measurement disturbances and damage of devices and to ensure the safety of the entire system.

2 Purpose of galvanic isolation

The main objectives of galvanic isolation in amperometric sensors comprise:

- **Prevention of interference signals:** Galvanic isolation eliminates interference signals such as ground loops which may lead to significant errors of measurement.
- **Increasing the safety:** Galvanic isolation protects devices from damage caused by voltage differences between system components.

3 Position of galvanic isolation

3.1 Galvanic isolation in the sensor

If the sensor is equipped with galvanic isolation, the selection of the measuring transducer is flexible. Disturbances caused by fault currents are excluded.

3.2 Galvanic isolation in the measuring transducer

If the measuring transducer is equipped with galvanic isolation, a sensor without galvanic isolation can be used. However, the following points must be considered for such use:

- Galvanic isolation must not be made ineffective by grounding.
- Each sensor needs its own galvanic isolation in the measuring input and voltage supply.

3.3 Galvanic isolation with an isolating amplifier

An isolating amplifier must be used if neither the measuring transducer nor the sensor is equipped with galvanic isolation.

Example:

Manufacturer: Knick
Type: WG 25

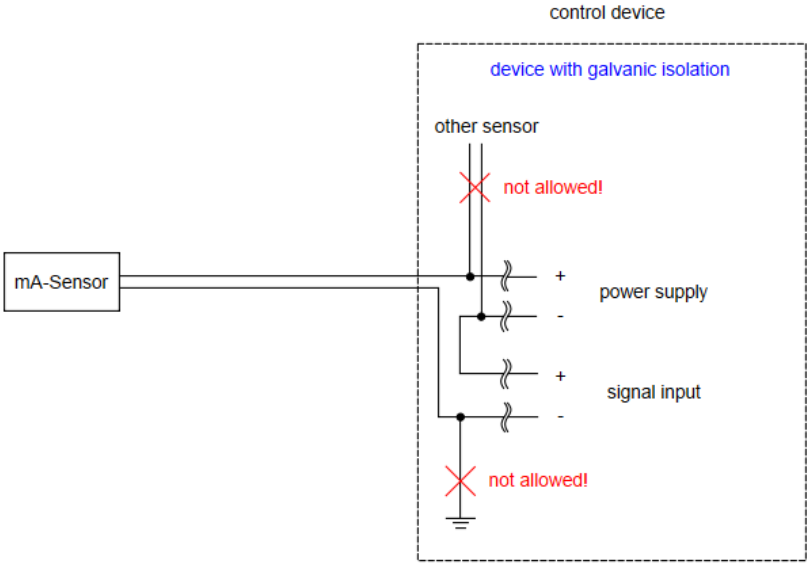
4 Effects of a non-existing galvanic isolation

- Fluctuating signals
- Shifted zero points
- Discolouration of the electrodes
- Destruction of the electronic system of the sensor

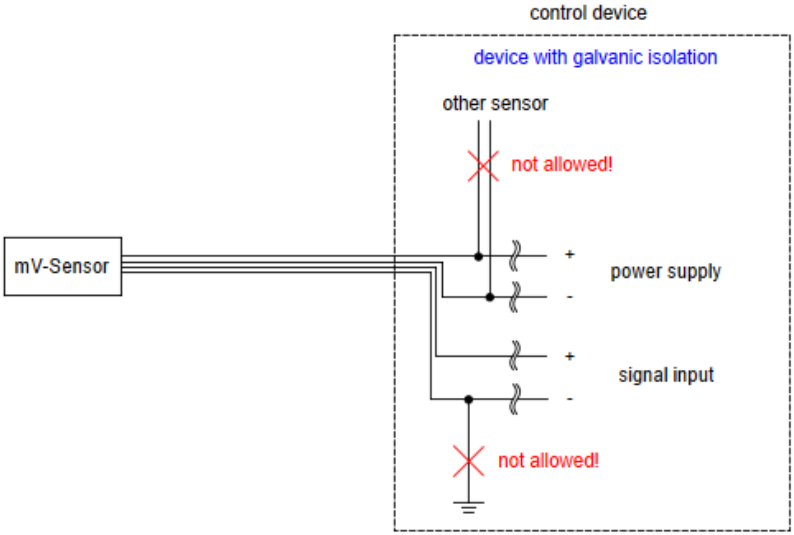
5 Circuit diagrams

5.1 Galvanic isolation in the measuring transducer

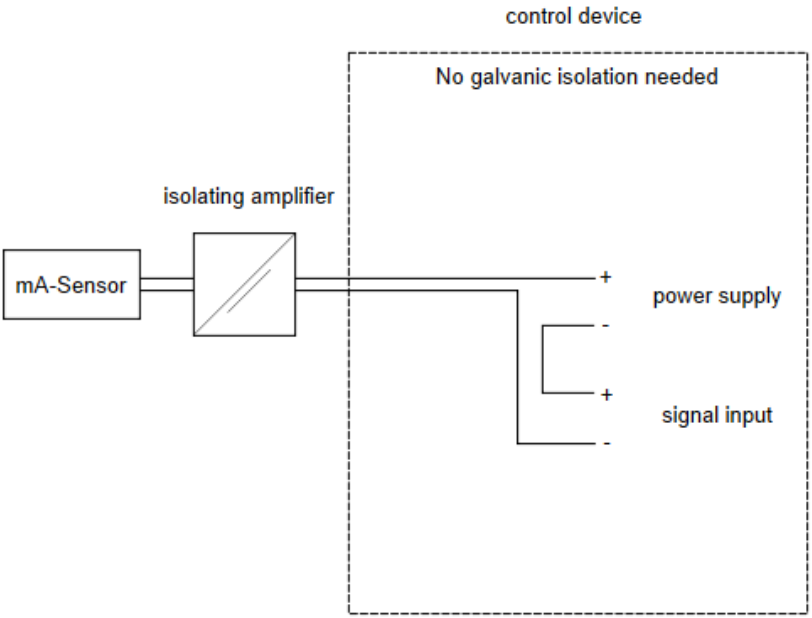
5.1.1 mA Sensor



5.1.2 mV Sensor



5.2 Galvanic isolation with an isolating amplifier



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