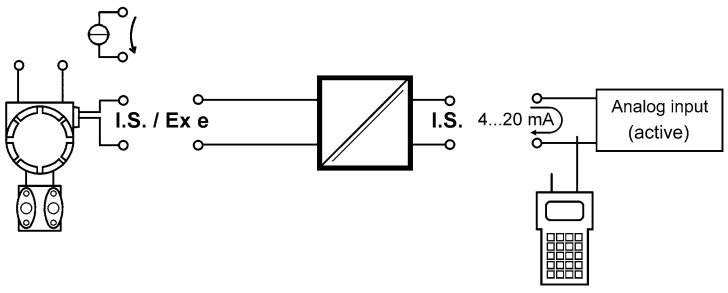
# I.S. Isolators


10512E00

**mA - Isolating Repeater**
**Type 9164**

- Interconnection of mA-sources and active 2-wire inputs is possible
- Perfect solution to integrate 4-wire transmitters with 2 wire I/O-cards
- Instrinsically safe input (I.S.) or increased safety protection Ex e version
- Be-directional HART transmission 4 mA ... 20 mA
- 1 channel
- Galvanic isolation between input and output
- Installation possible in Zone 1 and Zone 2

Basic function: Analog signal transmission 4 mA ... 20 mA for 4-wire transmitters with HART communication, 1 channel.
The mA - isolating repeaters are used for connection of 4-wire transmitters to active 2-wire inputs as well as to galvanic isolation.
The 4-wire transmitters can optionally be equipped with an intrinsically safe or increased safety protection output circuit.
The devices be-directionally transfer a superimposed HART communications signal.

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## Selection table

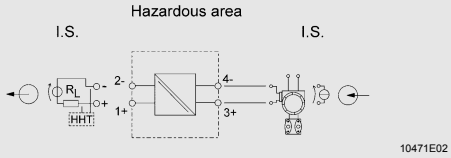
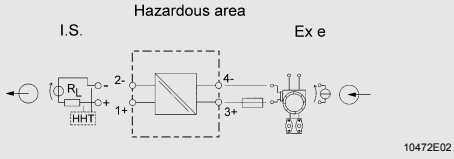
| Version | Channels | Input | Output | Ordering code |
|---|---|---|---|---|
| Isolating Repeater Type 9164 | 1 | I.S.: 4 mA ... 20 mA HART | I.S.: passive HART | **9164/13-22-08** |
| | | Ex e: 4 mA ... 20 mA HART | I.S.: passive HART | **9164/13-22-09** |

## Technical Data

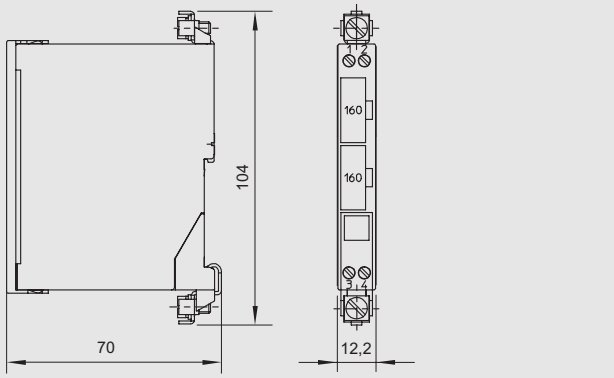
| **Version** | **9164/13-22-08 (I.S. Input)** | **9164/13-22-09 (Ex e Input)** |
|---|---|---|
| Certificates | KEMA 04 ATEX 1236 X | KEMA 04 ATEX 1298 |
| Other certificates | Brazil (UL do Brasil) | Brazil (UL do Brasil) |
| Explosion protection | ⟨Ex⟩ II 2G (1) GD EEx ia IIC T4 | ⟨Ex⟩ II 2 G (1) GD EEx e mb [ia] IIC T4 |
| Installation | In Zone 1, Zone 2 and in the safe area | In Zone 1, Zone 2 and in the safe area |
| Safety data (CENELEC) | | |
| Input | 4-wire transmitter-side<br>I.S. connection<br>Output parameters: $U_o$, $I_o$, $P_o$ = 0<br><br>Internal capacitance $C_i$: negligible<br>Internal inductance $L_i$: negligible<br>max. voltage $U_i$: 30 V<br>max. current $I_i$: 150 mA<br>max. power $P_i$: 1 W | 4-wire transmitter-side<br>Ex e connection<br><br>Nominal voltage $U_n$: 30 V<br>Nominal current $I_n$: 30 mA<br>Nominal power $P_n$: 1 W<br>Back-up fuse: 63 mA;<br>external (R.STAHL Type 8560) |
| Output | 2-wire-output<br>Output parameters: $U_o$, $I_o$, $P_o$ = 0<br><br>Internal capacitance $C_i$: negligible<br>Internal inductance $L_i$: negligible<br>max. voltage $U_i$: 30 V<br>max. corrent $I_i$: 150 mA<br>max. Leistung $P_i$: 800 mW<br><br>Further information and combinations of values, see certification. | 2-wire-output<br>Output parameters: $U_o$, $I_o$, $P_o$ = 0<br><br>Internal capacitance $C_i$: negligible<br>Internal inductance $L_i$: negligible<br>max. voltage $U_i$: 30 V<br>max. corrent $I_i$: 150 mA<br>max. Leistung $P_i$: 800 mW<br><br>If installed in Zone 1:<br>the isolating repeater has to be fitted into an enclosure which meets the requirements of EN 50 020<br><br>If installed in Zone 2:<br>the isolating repeater has to be fitted into an enclosure which meets the requirements of EN 50 021<br><br>Furhter information and combinations of values, see certification. |
| Galvanic isolation | Test voltage<br>I.S. input to I.S. output: 60 V AC | Test voltage<br>Ex e input to I.S. output: 1500 V AC |
| Power supply | without | without |
| Ex i / Ex e Input | | |
| Version | passive (current sink up) | passive (current sink up) |
| Signal input | 3.6 mA ... 21 mA with HART | 3.6 mA ... 21 mA with HART |
| Function area | 2.4 mA ... 25 mA | 2.4 mA ... 25 mA |
| Constant voltage drop | ≤ 3.5 V | ≤ 3.5 V |
| Input resistance | at 0.5 kHz ... 5 kHz; 240 Ω ... 260 Ω (AC-Impedance HART) | at 0.5 kHz ... 5 kHz; 240 Ω ... 260 Ω (AC-Impedance HART) |
| Communication signal | HART transmission be-directional; 0.5 kHz ... 5 kHz | HART transmission be-directional; 0.5 kHz ... 5 kHz |
| Polarity reversal protection | yes | yes |

# mA - Isolating Repeater
# Type 9164

## Technical Data

| Version | 9164/13-22-08 (I.S. Input) | 9164/13-22-09 (Ex e Input) |
|---|---|---|
| I.S. output | | |
| Version | passive (current sink up) | passive (current sink up) |
| Signal output | 3.6 mA ... 21 mA with HART | 3.6 mA ... 21 mA with HART |
| Area around supply voltage of 2-wire input (active) | 12 V ... 30 V | 12 V ... 30 V |
| Response time (10 % ... 90 %) | ≤ 1 ms | ≤ 1 ms |
| Input resistance | > 10 kΩ | > 10 kΩ |
| | HART transmission be-directional; 0.5 kHz ... 5 kHz | HART transmission be-directional; 0.5 kHz ... 5 kHz |
| Polarity reversal protection | yes | yes |
| Error detection, input $I_e$ ~ 0 | | |
| Open circuit | Output current < 2.4 mA | Output current < 2.4 mA |
| Short-circuit | Output current < 2.4 mA | Output current < 2.4 mA |
| Error limits | | |
| | Accuracy, typical data expressed as % of calibrated span (21 mA) at 23 °C | Accuracy, typical data expressed as % of calibrated span (21 mA) at 23 °C |
| Linearity error | ≤ 0.1 % | ≤ 0.1 % |
| Offset error | ≤ 0.1 % | ≤ 0.1 % |
| Temperature effect | ≤ 0.1 % / 10 K | ≤ 0.1 % / 10 K |
| Electromagnetic compatibility | Tested under the following standards and regulations: EN 61326 (IEC/EN 61000-4-2,3,4,5,6 EN 55022 Class B) | Tested under the following standards and regulations: EN 61326 (IEC/EN 61000-4-2,3,4,5,6 EN 55022 Class B) |
| Ambient temperature | | |
| Ambient temperature | - 20 °C ... + 70 °C (watch instructions) | - 20 °C ... + 70 °C (watch instructions) |
| Storage temperature range | - 40 °C ... + 80 °C | - 40 °C ... + 80 °C |
| Relative humidity (no condensation) | ≤ 90 % | ≤ 90 % |
| Connection diagram | 9164/13-22-08 (I.S. Input)   10471E02 | 9164/13-22-09 (Ex e Input)   10472E02 |
| Mechanical data | | |
| Enclosure material | Polyamide 6 GF | Polyamide 6 GF |
| Degree of Protection | according to IEC 60529 | according to IEC 60529 |
| | terminal enclosure: IP 20 | terminal enclosure: IP 20 |
| | housing: IP 40 | housing: IP 40 |
| Connection | 4 cage terminals, each maximum 1.5 mm² flexible / solid | 4 cage terminals, each maximum 1.5 mm² flexible / solid |
| Weight | approx. 0.115 kg | approx. 0.115 kg |

**Dimension drawing** (all dimensions in mm) - subject to alterations

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