PERFORMANCE MADE SMARTER

## HART transparent repeater

# 9106B

– 24 VDC supply via power rail or connectors
– Active and passive mA input
– Active or passive output via the same two terminals
– Splitter function - 1 in and 2 out
– SIL3 Full Assessment and certified acc. to IEC 61508

### Application

- 9106B is a 1- or 2-channel isolated 1:1 repeater barrier for intrinsic safety applications.
- The device supplies 2-wire SMART transmitters and can also be used for 2-wire SMART current sources. HART & BRAIN protocols are supported and are transferred bi-directionally.
- 9106B can be mounted in the safe area or in zone 2 / Cl. 1, div. 2 and receive signals from zone 0, 1, 2 and zone 20, 21, 22 including mining / Class I/II/III, Div. 1, Gr. A-G.
- For duplication/migration purposes, the outputs can be sent to two different DCS/PLC/HMI or any monitoring system.
- In safety applications (SIL loops), the 9106BxBx can be used as a splitter with the following output configuration: • When using 9106BxBx in a SIL2 safety function, channel 1 is used for the safety loop. Channel 2 can be used for any non-safety device. • For higher safety purposes (SIL 3), 9106BxBx can be used as a splitter for SIL 3 loops. Channel 1 and 2 are then connected to the same safety PLC, where channel 2 is used as a redundant diagnostic channel (for more information, consult the FMEDA Report and the Safety Manual).

### Advanced features

- The PR 4500 detachable display and the green and red front LEDs indicate operation status for each channel.
- Monitoring of error events and cable breakage on input via the individual status relay and/or a collective electronic signal via the power rail.
- Failure rates for 9106B correspond to Performance Level “d” according to ISO-13849.

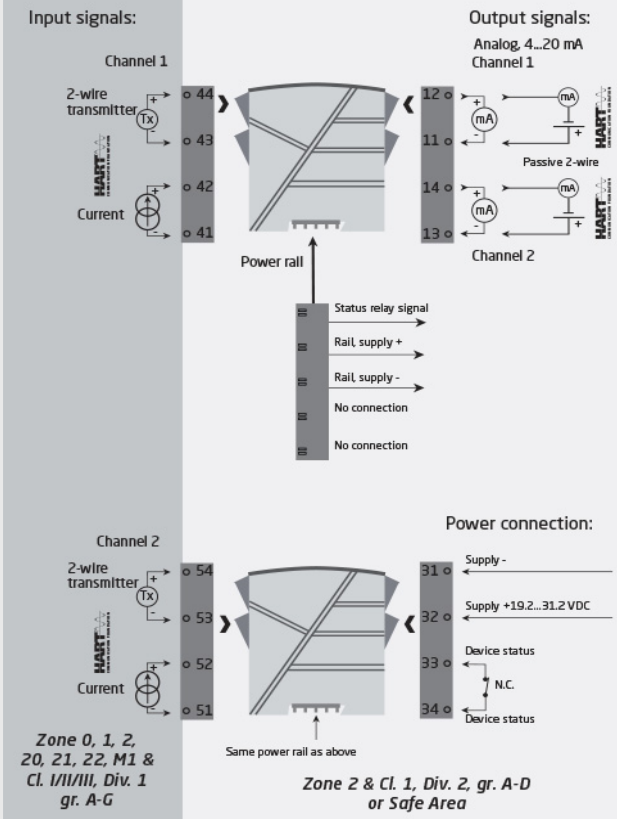
### Technical characteristics

- High galvanic isolation of 2.6 kVAC.
- Fast response time <5 ms
- High accuracy better than 0.1%.
- 2-wire transmitter supply >16 V.

### Mounting

- The devices can be mounted vertically or horizontally without distance between neighboring units.

### Applications



## Order

| Type | Barrier version | | Unit channels | | I.S. / Ex approvals | |
|---|---|---|---|---|---|---|
| 9106B | Uo = 27.5 V | : 1 | Single | : A | ATEX, IECEx, FM, INMETRO, CCC, EAC-Ex, UKEX | : - |
| | Uo = 25.3 V | : 2 | Double | : B | UL913, ATEX, IECEx, FM, INMETRO, CCC, EAC-Ex, UKEX | : -U9 |
| | | | | | KCs, ATEX, IECEx, FM, INMETRO, CCC, EAC-Ex, UKEX | : -KCs |

**Example: 9106B2B**

Remember to order short-circuit bridge(s) ST9106-01 when using the 9106 with no load on the output terminals.

## Environmental Conditions

| | |
|---|---|
| Operating temperature | -20°C to +60°C |
| Storage temperature | -20°C to +85°C |
| Calibration temperature | 20...28°C |
| Relative humidity | < 95% RH (non-cond.) |
| Protection degree | IP20 |
| Installation in | Pollution degree 2 & meas. / overvoltage cat. II |

## Mechanical specifications

| | |
|---|---|
| Dimensions (HxWxD) | 109 x 23.5 x 104 mm |
| Dimensions (HxWxD) w/ PR 4500 | 109 x 23.5 x 131 mm |
| Weight approx | 250 g |
| DIN rail type | DIN EN 60715/35 mm |
| Wire size | 0.13...2.08 $mm^2$ AWG 26...14 stranded wire |
| Screw terminal torque | 0.5 Nm |
| Vibration | IEC 60068-2-6 |
| 2...13.2 Hz | ±1 mm |
| 13.2...100 Hz | ±0.7 g |

## Common specifications

**Supply**

| | |
|---|---|
| Supply voltage | 19.2...31.2 VDC |
| Fuse | 1.25 A SB / 250 VAC |
| Max. required power | ≤ 1.1 W / ≤ 1.9 W (1 ch. / 2 ch.) |
| Max. power dissipation, 1 / 2 ch. | ≤ 0.8 W / ≤ 1.2 W |

**Isolation voltage**

| | |
|---|---|
| Test /working: Input to any | 2.6 kVAC / 300 VAC reinforced isolation |
| Analog output to supply | 2.6 kVAC / 300 VAC reinforced isolation |
| Status relay to supply | 1.5 kVAC / 150 VAC reinforced isolation |

**Response time**

| | |
|---|---|
| Response time (0...90%, 100...10%) | < 5 ms |
| Programming | PR 4500 communication interfaces |
| Signal dynamics, input | Analog signal chain |
| Signal dynamics, output | Analog signal chain |
| SMART bi-directional communication frequency range | 0.5...7.5 kHz |
| Signal / noise ratio | > 60 dB |
| Accuracy | Better than 0.1% of sel. range |
| mA, absolute accuracy | ≤ ±16 µA |
| mA, temperature coefficient | ≤ ±1.6 µA / °C |
| Effect of supply voltage change on output (nom. 24 VDC) | < ±10 µA |
| EMC immunity influence | < ±0.5% of span |
| Extended EMC immunity: NAMUR NE21, A criterion, burst | < ±1% of span |

## Input specifications

**Current input**

| | |
|---|---|
| Measurement range | 3.5...23 mA |
| 2-wire transmitter supply 9106B1x (Uo = 27.5 VDC) | >16 V / 20 mA |
| 2-wire transmitter supply 9106B2x (Uo = 25.3 VDC) | >15 V / 20 mA |
| Sensor error detection: Loop break 4...20 mA | < 1 mA |
| Input voltage drop, supplied unit | < 4 V @ 23 mA |
| Input voltage drop, non-supplied unit | < 6 V @ 23 mA |

## Output specifications

**Current output**

| | |
|---|---|
| Signal range | 3.5...23 mA |
| Load (@ current output) | ≤ 600 Ω |
| Load stability | ≤ 0.01% of span / 100 Ω |
| Current limit | ≤ 28 mA |

**Passive 2-wire mA output**

| | |
|---|---|
| Effect of external 2-wire supply voltage variation | < 0.005% of span / V |
| Max. external 2-wire supply | 26 VDC |

**Status relay**

| | |
|---|---|
| Relay function | N.C. |
| Programmable low setpoint | 0...29.9 mA |
| Programmable high setpoint | 0...29.9 mA |
| Hysteresis for setpoints | 0.1 mA |
| Max. voltage | 125 VAC / 110 VDC |
| Max. current | 0.5 AAC / 0.3 ADC |
| Max. voltage - hazardous installation | 32 VDC / 32 VAC |
| Max. current - hazardous installation | 1 ADC / 0.5 AAC |
| of span | = normal measurement range 4...20 mA |

## Observed authority requirements

| | |
|---|---|
| EMC | 2014/30/EU & UK SI 2016/1091 |
| LVD | 2014/35/EU & UK SI 2016/1101 |
| ATEX | 2014/34/EU & UK SI 2016/1107 |
| RoHS | 2011/65/EU & UK SI 2012/3032 |
| EAC | TR-CU 020/2011 |
| EAC Ex | TR-CU 012/2011 |
| EAC LVD | TR-CU 004/2011 |

## Approvals

| | |
|---|---|
| ATEX | DEKRA 11ATEX0244 X |
| IECEx | DEK 11.0084X |
| UKEX | DEKRA 21UKEX0171X |
| UKEX | DEKRA 23UKEX0107X |
| c FM us | FM16US0465X / FM16CA0213X |
| INMETRO | DEKRA 23.0003X |
| c UL us, UL 61010-1 | E314307 |
| c UL us, UL 913 | E233311 (only 9106xxx-U9) |
| CCC | 2020322309003231 |
| KCs | 21_AV4BO_0167X / 21_AV4BO_0168X (only 9106Bxx-KCs) |
| EAC Ex | EAEU KZ 7500361.01.01.08756 |
| DNV Marine | TAA00000JD |
| ClassNK | TA24034M |
| SIL | SIL 2 / SIL 3 certified & fully assessed acc. to IEC 61508 |