

Power/input isolating amplifier - MACX MCR-EX-SL-RPSSI-I - 2865340

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Ex i repeater power supply and input signal conditioner, HART. Transmits supplied or active 0/4 - 20 mA signals from the hazardous area to a load (active or passive) in the safe area. 3-way electrical isolation; SIL 2 according to IEC 61508, with screw connection

Why buy this product

- 0/4 mA ... 20 mA input, intrinsically safe, [Ex ia], powered and not powered
- Measuring transducer supply voltage > 16 V
- 0/4 mA ... 20 mA output, active up to 1000 # load or passive
- Bidirectional HART signal transmission
- Error indication according to NAMUR NE 43
- SIL 2 according to IEC 61508/EN 61508
- Installation in Ex zone 2 permitted
- 3-way electrical isolation
- Power supply possible via DIN rail connector
- Plug-in connection terminal blocks, screw connection technology, with integrated sockets for HART communicators
- Housing width: 12.5 mm
- Minimal power dissipation
- High transmission accuracy



Key Commercial Data

| | |
|--------------------------------------|-----------------|
| Packing unit | 1 pc |
| GTIN | 4 046356 160353 |
| Weight per Piece (excluding packing) | 137.4 GRM |
| Country of origin | Germany |

Technical data

Note

Power/input isolating amplifier - MACX MCR-EX-SL-RPSSI-I - 2865340

Technical data

Note

| | |
|-------------------------|---|
| Utilization restriction | EMC: class A product, see manufacturer's declaration in the download area |
|-------------------------|---|

Dimensions

| | |
|--------|----------|
| Width | 12.5 mm |
| Height | 112.5 mm |
| Depth | 114.5 mm |

Ambient conditions

| | |
|---|---|
| Ambient temperature (operation) | -20 °C ... 60 °C (Any mounting position) |
| Ambient temperature (storage/transport) | -40 °C ... 80 °C |
| Maximum altitude | ≤ 2000 m |
| Permissible humidity (operation) | 10 % ... 95 % (non-condensing) |
| Noise immunity | EN 61000-6-2 When being exposed to interference, there may be minimal deviations. |
| Degree of protection | IP20 |

Input data

| | |
|-----------------------------------|--|
| Signal input | Active current input, intrinsically safe |
| Current input signal | 4 mA ... 20 mA |
| Transmitter supply voltage | > 16 V (20 mA) |
| | > 15.3 V (22.5 mA) |
| Polarization and surge protection | Yes |
| Signal input | Passive current input, intrinsically safe |
| Current input signal | 0 mA ... 20 mA |
| | 4 mA ... 20 mA |
| Voltage drop | < 3.5 V (in input isolating amplifier operation) |

Output data

| | |
|--|--|
| Signal output | Current output (active and passive) |
| Current output signal | 4 mA ... 20 mA (active) |
| | 4 mA ... 20 mA (14 ... 26 V ext. source voltage) |
| Transmission Behavior | 1:1 to input signal |
| Load/output load current output | < 1000 Ω (20 mA) |
| | < 825 Ω (24 mA) |
| Output ripple | < 20 mV _{rms} |
| Output behavior in the event of an error | 0 mA (Cable break in the input) |
| | ≥ 22.5 mA (Cable short-circuit in the input) |
| Signal output | Current output (active and passive) |
| Current output signal | 0 mA ... 20 mA (active) |
| | 4 mA ... 20 mA (active) |
| | 0 mA ... 20 mA (14 ... 26 V ext. source voltage) |
| | 4 mA ... 20 mA (14 ... 26 V ext. source voltage) |
| Transmission Behavior | 1:1 to input signal |

Power/input isolating amplifier - MACX MCR-EX-SL-RPSSI-I - 2865340

Technical data

Output data

| | |
|--|---|
| Load/output load current output | < 1000 Ω (20 mA) |
| | < 825 Ω (24 mA) |
| Output ripple | < 20 mV _{rms} |
| Output behavior in the event of an error | 0 mA (Cable break in the input) |
| | 0 mA (Cable short-circuit in the input) |

Power supply

| | |
|--------------------------|---|
| Designation | Repeater power supply operation |
| Nominal supply voltage | 24 V DC |
| Supply voltage range | 19.2 V DC ... 30 V DC (24 V DC -20%...+25%) |
| Max. current consumption | < 76 mA (24 V DC / 20 mA / 1000 #) |
| Power consumption | < 1.1 W (24 V DC / 20 mA / 1000 #) |
| | < 1.8 W (20 mA / 1000 #) |

Connection data

| | |
|---------------------------------------|---------------------|
| Conductor cross section solid min. | 0.2 mm ² |
| Conductor cross section solid max. | 2.5 mm ² |
| Conductor cross section flexible min. | 0.2 mm ² |
| Conductor cross section flexible max. | 2.5 mm ² |
| Conductor cross section AWG min. | 24 |
| Conductor cross section AWG max. | 14 |
| Stripping length | 7 mm |
| Screw thread | M3 |
| Connection method | Screw connection |
| Tightening torque, min | 0.5 Nm |
| Tightening torque max | 0.6 Nm |

General

| | |
|--|--|
| No. of channels | 1 |
| Maximum transmission error | < 0.1 % (of final value) |
| Transmission error, typical | < 0.05 % (of final value) |
| Maximum temperature coefficient | < 0.01 %/K |
| Temperature coefficient, typical | < 0.004 %/K |
| Step response (10-90%) | < 200 μs (for jump 4 mA ... 20 mA, load 600) |
| | < 600 μs (for jump 0 mA ... 20 mA, load 600) |
| Status display | Green LED (supply voltage) |
| Flammability rating according to UL 94 | V0 |
| Degree of pollution | 2 |
| Overvoltage category | II |
| Electromagnetic compatibility | Conformance with EMC directive |
| Housing material | PA 66-FR |
| Color | green |

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Technical data

General

| | |
|-------------------------|--|
| Designation | Input/output/power supply |
| Electrical isolation | 300 V _{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) |
| | 2.5 kV (50 Hz, 1 min., test voltage) |
| Designation | Input/output |
| Electrical isolation | 375 V (Peak value in accordance with EN 60079-11) |
| Designation | Input/power supply |
| Electrical isolation | 375 V (Peak value in accordance with EN 60079-11) |
| Conformance | CE-compliant, additionally EN 61326 |
| ATEX | # II (1) G [Ex ia Ga] IIC/IIB |
| | # II (1) D [Ex ia Da] IIIC |
| | # II 3 (1) G Ex nA [ia Ga] IIC/IIB T4 Gc |
| | # I (M1) [Ex ia Ma] I |
| IECEX | [Ex ia Ga] IIC/IIB |
| | [Ex ia Da] IIIC |
| | Ex nA [ia Ga] IIC/IIB T4 Gc |
| | [Ex ia Ma] I |
| UL, USA / Canada | UL 61010 Listed |
| | Class I Div 2; IS for Class I, II, III Div 1 |
| Functional Safety (SIL) | SIL 2 |

Data communication (bypass)

| | |
|---------------------|------|
| HART function | Yes |
| Protocols supported | HART |

Safety characteristic data

| | |
|--|--|
| Integrity requirement | IEC 61508 - Low demand |
| Equipment type | Type A |
| Safety Integrity Level (SIL) | Up to 2 |
| Safe Failure Fraction (SFF) | 90.7 % |
| λ_{SU} | 4.867×10^{-7} (486.7 FIT) |
| λ_{SD} | 0 |
| λ_{DU} | 5×10^{-8} (50 FIT) |
| λ_{DD} | 0 |
| Probability of a hazardous failure on demand (PFD _{AVG}) | 2.40×10^{-4} (1 year) |
| | 4.76×10^{-4} (2 years) |
| | 7.13×10^{-4} (3 years) |
| | 9.50×10^{-4} (4 years) |
| | 11.9×10^{-4} (5 years) |
| Diagnostic coverage (DC) | DC _S = 0%, DC _D = 0% |
| Integrity requirement | IEC 61508 - High demand |

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Technical data

Safety characteristic data

| | |
|---|--|
| Equipment type | Type A |
| Safety Integrity Level (SIL) | Up to 2 |
| Safe Failure Fraction (SFF) | 90.7 % |
| λ_{SU} | 4.867×10^{-7} (486.7 FIT) |
| λ_{SD} | 0 |
| λ_{DU} | 5×10^{-8} (50 FIT) |
| λ_{DD} | 0 |
| Probability of a hazardous failure per hour (PFH _D) | $4,99 \times 10^{-8}$ |
| Diagnostic coverage (DC) | DC _S = 0%, DC _D = 0% |

Safety data

| | |
|---|---------------------------------|
| Operation | Repeater power supply operation |
| Max. output voltage U _o | 25.2 V |
| Max. output current I _o | 93 mA |
| Max. output power P _o | 587 mW |
| Group | IIC |
| Max. external inductivity L _o | 2 mH |
| Max. external capacity C _o | 107 nF |
| Group | IIB |
| Max. external inductivity L _o | 4 mH |
| Max. external capacity C _o | 820 nF |
| Safety-related maximum voltage U _m | 253 V AC (125 V DC) |
| Operation | Signal conditioner operation |
| Input voltage U _i | ≤ 30 V |
| Input current I _i | ≤ 150 mA |
| Max. internal inductance L _i | negligible |
| Max. internal capacitance C _i | negligible |

EMC data

| | |
|--|--------------------------|
| Designation | Electromagnetic RF field |
| Standards/regulations | EN 61000-4-3 |
| Typical deviation from the measuring range final value | 1 % |
| Designation | Fast transients (burst) |
| Standards/regulations | EN 61000-4-4 |
| Typical deviation from the measuring range final value | 1 % |
| Designation | Conducted interferences |
| Standards/regulations | EN 61000-4-6 |
| Typical deviation from the measuring range final value | 1 % |

Standards and Regulations

| | |
|-------------------------------|--------------------------------|
| Electromagnetic compatibility | Conformance with EMC directive |
|-------------------------------|--------------------------------|

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Technical data

Standards and Regulations

| | |
|--|--|
| Designation | Electromagnetic RF field |
| Standards/regulations | EN 61000-4-3 |
| | EN 61000-4-4 |
| Designation | Conducted interferences |
| Standards/regulations | EN 61000-4-6 |
| Flammability rating according to UL 94 | V0 |
| Conformance | CE-compliant, additionally EN 61326 |
| ATEX | # II (1) G [Ex ia Ga] IIC/IIB |
| | # II (1) D [Ex ia Da] IIIC |
| | # II 3 (1) G Ex nA [ia Ga] IIC/IIB T4 Gc |
| | # I (M1) [Ex ia Ma] I |
| IECEX | [Ex ia Ga] IIC/IIB |
| | [Ex ia Da] IIIC |
| | Ex nA [ia Ga] IIC/IIB T4 Gc |
| | [Ex ia Ma] I |
| UL, USA / Canada | UL 61010 Listed |
| | Class I Div 2; IS for Class I, II, III Div 1 |
| Group | IIC |
| | IIB |

Classifications

eCl@ss

| | |
|------------|----------|
| eCl@ss 4.0 | 27210121 |
| eCl@ss 4.1 | 27210121 |
| eCl@ss 5.0 | 27210121 |
| eCl@ss 5.1 | 27210121 |
| eCl@ss 6.0 | 27210120 |
| eCl@ss 7.0 | 27210120 |
| eCl@ss 8.0 | 27210120 |
| eCl@ss 9.0 | 27210120 |

ETIM

| | |
|----------|----------|
| ETIM 2.0 | EC001431 |
| ETIM 3.0 | EC001596 |
| ETIM 4.0 | EC002653 |
| ETIM 5.0 | EC002653 |

UNSPSC

| | |
|---------------|----------|
| UNSPSC 6.01 | 30211506 |
| UNSPSC 7.0901 | 39121008 |

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Classifications

UNSPSC

| | |
|--------------|----------|
| UNSPSC 11 | 39121008 |
| UNSPSC 12.01 | 39121008 |
| UNSPSC 13.2 | 39121008 |

Approvals

Approvals

Approvals

UL Listed / cUL Listed / Functional Safety / GL / EAC / BV / cULus Listed

Ex Approvals

IECEX / ATEX / UL Listed / cUL Listed / EAC Ex / cULus Listed

Approvals submitted

Approval details

UL Listed

cUL Listed

Functional Safety

GL

EAC

BV

cULus Listed

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Accessories

Accessories

DIN rail connector

DIN rail connector - ME 6,2 TBUS-2 1,5/5-ST-3,81 GN - 2869728



DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

Power module

Power and error message module - MACX MCR-PTB - 2865625



Power and fault signaling module with screw connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GN DIN rail connector

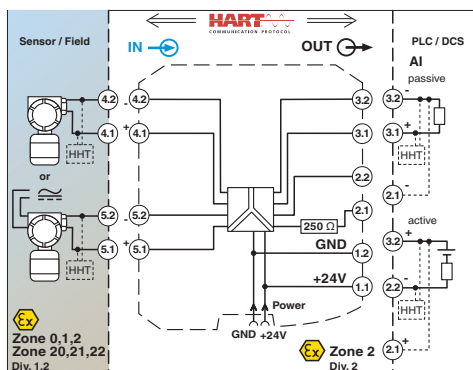
Power and error message module - MACX MCR-PTB-SP - 2924184



Power and fault signaling module with push-in connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GN DIN rail connector

Drawings

Block diagram



Dimensional drawing

