

MACX MCR-EX-SL-RPSSI-2I-1S-SP - Repeater power supply



2908856

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Ex i-Measuring transducer repeater power supply and input signal conditioner, only output 1 is HART-transparent. Transmits supplied or active electrically isolated signals from the Ex area to two loads. number of channels: 1, HART transparency, Standard configuration, Safety Integrity Level (SIL, IEC 61508): 2, Performance Level (ISO 13849): d / KAT 2, Systematic Capability: 3, Push-in connection

Commercial data

| | |
|--------------------------------------|---------------|
| Item number | 2908856 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | C430 |
| Product key | DK1211 |
| GTIN | 4055626352183 |
| Weight per piece (including packing) | 250 g |
| Weight per piece (excluding packing) | 175 g |
| Customs tariff number | 85437090 |
| Country of origin | DE |

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Technical data

Product properties

| | |
|-----------------|-----------------------|
| Product type | Repeater power supply |
| Product family | MACX Analog |
| No. of channels | 1 |

Electrical properties

| | |
|---|---|
| Electrical isolation between input and output | yes |
| Signal transmission behavior | In = Out |
| Step response (10-90%) | 1.3 ms (Output 1, for jump 4 mA ... 20 mA, typical) < 100 ms (Output 2, for jump 4 mA ... 20 mA) |
| Maximum temperature coefficient | < 0.01 %/K |
| Maximum transmission error | < 0.1 % (of final value 20 mA) |
| Transmission error, typical | < 0.05 % (of final value 20 mA) |

Electrical isolation

| | |
|----------------------|----|
| Overvoltage category | II |
| Pollution degree | 2 |

Electrical isolation Input/output/power supply IEC/EN 61010-1

| | |
|--------------------------|-------------------------|
| Standards/regulations | IEC/EN 61010-1 |
| Rated insulation voltage | 300 V _{rms} |
| Test voltage | 2.5 kV AC (50 Hz, 60 s) |
| Insulation | Safe isolation |

Electrical isolation Input/output IEC/EN 60079-11

| | |
|--------------------------|----------------------|
| Standards/regulations | IEC/EN 60079-11 |
| Rated insulation voltage | 265 V _{rms} |

Electrical isolation Input/power supply IEC/EN 60079-11

| | |
|--------------------------|----------------------|
| Standards/regulations | IEC/EN 60079-11 |
| Rated insulation voltage | 265 V _{rms} |

Electrical isolation Output 1/output 2

| | |
|--------------|-------------------------|
| Test voltage | 1.5 kV AC (50 Hz, 60 s) |
|--------------|-------------------------|

Supply

| | |
|--------------------------|---------------------------------|
| Designation | Repeater power supply operation |
| Nominal supply voltage | 24 V DC -20 % ... +25 % |
| Supply voltage range | 19.2 V DC ... 30 V DC |
| Max. current consumption | < 75 mA (24 V DC / 20 mA) |
| Power dissipation | < 1.45 W (24 V DC / 20 mA) |
| Power consumption | ≤ 1.8 W |

Supply

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| | |
|--------------------------|------------------------------|
| Designation | Signal conditioner operation |
| Nominal supply voltage | 24 V DC -20 % ... +25 % |
| Supply voltage range | 19.2 V DC ... 30 V DC |
| Max. current consumption | < 46 mA (24 V DC / 20 mA) |
| Power dissipation | < 1.1 W (24 V DC/20 mA) |

Input data

Signal: Repeater power supply operation

| | |
|-----------------------------------|--|
| Description of the input | Repeater power supply operation |
| Number of inputs | 1 |
| Current input signal | 4 mA ... 20 mA |
| Transmitter supply voltage | > 16 V (20 mA) |
| | > 15.1 V (23 mA) |
| Polarization and surge protection | Yes |
| Underload/overload signal range | 0 mA ... 24 mA (Extended transmission range for diagnostics) |

Signal: Signal conditioner operation

| | |
|---------------------------------|--|
| Description of the input | Signal conditioner operation |
| Current input signal | 0 mA ... 20 mA |
| | 4 mA ... 20 mA |
| Voltage drop | approx. 3.9 V (in input isolating amplifier operation) |
| Underload/overload signal range | 0 mA ... 24 mA (Extended transmission range for diagnostics) |

Output data

Signal: Repeater power supply operation

| | |
|--|--|
| Output description | Repeater power supply operation |
| Number of outputs | 2 |
| Current output signal | 4 mA ... 20 mA (Output 1 and output 2 active) |
| Load/output load current output | < 450 Ω (20 mA) |
| | < 380 Ω (23 mA) |
| Output ripple | < 20 mV _{rms} |
| Output behavior in the event of an error | 0 mA (Cable break in the input) |
| | ≥ 23 mA (Cable short-circuit in the input) |
| Underload/overload signal range | 0 mA ... 24 mA (Extended transmission range for diagnostics) |

Signal: Signal conditioner operation

| | |
|--|---|
| Output description | Signal conditioner operation |
| Current output signal | 0 mA ... 20 mA (active) |
| | 4 mA ... 20 mA (active) |
| Load/output load current output | < 450 Ω (20 mA) |
| | < 380 Ω (23 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) |

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| | |
|---------------------------------|--|
| Underload/overload signal range | 0 mA ... 24 mA (Extended transmission range for diagnostics) |
|---------------------------------|--|

Connection data

| | |
|---|---|
| Connection method | Push-in connection |
| Stripping length | 10 mm |
| Conductor cross-section rigid | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross-section flexible | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross-section flexible (2 conductors with same cross section) | 0.25 mm ² ... 0.34 mm ² (TWIN ferrule without plastic sleeve) |
| | 0.5 mm ² ... 1.5 mm ² (TWIN ferrule with plastic sleeve) |
| Conductor cross-section AWG | 24 ... 14 |
| | 24 ... 22 (TWIN ferrule without plastic sleeve) |
| | 20 ... 16 (TWIN ferrule with plastic sleeve) |

Test socket

| | |
|---------------|------|
| Max. diameter | 2 mm |
|---------------|------|

Ex data

| | |
|-----------------------|----------|
| Ex installation (EPL) | Gc |
| | Div. 2 |
| Ex i circuits (EPL) | [Ga] |
| | [Da] |
| | [Ma] |
| | [Div. 1] |

Safety data: 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 |
| Safety-related maximum voltage U_m | 253 V AC |
| | 125 V DC |
| I (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 40 mH / 4.8 μ F |
| IIA (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 26 mH / 2.9 μ F |
| IIB (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 14 mH / 820 nF |
| IIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 3 mH / 107 nF |
| IIA (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 26 mH / 470 nF, 20 mH / 570 nF, 1 mH / 630 nF, 0.5 mH / 720 nF, 0.1 mH / 1.1 μ F, 0.005 mH / 2.9 μ F |
| IIB/IIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 16 mH / 370 nF, 1 mH / 430 nF, 500 μ H / 510 nF, 200 μ H / 660 nF, 100 μ H / 820 nF |
| IIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 2.2 mH / 47 nF, 2 mH / 49 nF, 1 mH / 63 nF, 500 μ H / 80 nF, 200 μ H / 107 nF |
| I (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 37 mH / 0.54 μ F, 0.2 mH / 1.1 μ F, 10 μ H / 2.8 μ F, 0.001 mH / 4.15 μ F |

Safety data: Signal conditioner operation

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| | |
|--------------------------------------|---------------|
| Input voltage U_i | ≤ 30 V |
| Input current I_i | ≤ 150 mA |
| Max. internal inductance L_i | negligible |
| Max. internal capacitance C_i | negligible |
| Safety-related maximum voltage U_m | 253 V AC |
| | 125 V DC |

Interfaces

Data communication (bypass)

| | |
|---------------------|----------------------|
| HART function | HART transparency |
| Protocols supported | HART |
| Protocol | HART (only output 1) |

Signaling

| | |
|----------------|----------------------------|
| Status display | Green LED (supply voltage) |
|----------------|----------------------------|

Dimensions

| | |
|---------------------|--|
| Dimensional drawing | |
| Width | 12.5 mm |
| Height | 107.9 mm |
| Depth | 113.7 mm |
| Depth NS 35/7,5 | 114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715) |

Material specifications

| | |
|--|-----------------|
| Color | gray (RAL 7042) |
| Flammability rating according to UL 94 (Housing) | V0 (Housing) |
| Housing material | PA 6.6-FR |

Environmental and real-life conditions

Ambient conditions

| | |
|---|--|
| Degree of protection | IP20 (not assessed by UL) |
| Ambient temperature (operation) | -40 °C ... 60 °C (Any mounting position) |
| | -40 °C ... 70 °C (Derating) |
| Ambient temperature (storage/transport) | -40 °C ... 80 °C |
| Permissible humidity (operation) | 10 % ... 95 % (non-condensing) |

Altitude range (≤ 2000 m)

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| | |
|---------------------------------|--|
| Altitude | ≤ 2000 m (The technical data refers to altitudes ≤2000 m above mean sea level. For altitudes >2000 m above mean sea level, refer to the data sheet.) |
| Ambient temperature (operation) | -40 °C ... 60 °C -40 °C ... 70 °C (Derating) |
| Rated insulation voltage | 375 V _{PP} (Power supply, input / output) |

Altitude range (≤ 3000 m)

| | |
|---------------------------------|--|
| Height range | > 2000 m ... 3000 m |
| Ambient temperature (operation) | -40 °C ... 54 °C -40 °C ... 63 °C (Derating) |
| Rated insulation voltage | 190 V AC (Power supply, input / output) 110 V DC (Power supply, input / output) |

Altitude range (≤ 4000 m)

| | |
|---------------------------------|---|
| Height range | > 3000 m ... 4000 m |
| Ambient temperature (operation) | -40 °C ... 48 °C -40 °C ... 56 °C (Derating) |
| Rated insulation voltage | 60 V AC/DC (Power supply, input / output) |

Altitude range (≤ 5000 m)

| | |
|---------------------------------|---|
| Height range | > 4000 m ... 5000 m |
| Ambient temperature (operation) | -40 °C ... 42 °C -40 °C ... 49 °C (Derating) |
| Rated insulation voltage | 60 V AC/DC (Power supply, input / output) |

Approvals

CE

| | |
|-------------|--------------|
| Certificate | CE-compliant |
| Note | and EN 61326 |

ATEX

| | |
|----------------|---|
| Identification | ⊕ II (1) G [Ex ia Ga] IIC ⊕ II (1) D [Ex ia Da] IIIC ⊕ II 3(1) G Ex ec [ia Ga] IIC T4 Gc ⊕ I (M1) [Ex ia Ma] I |
| Certificate | BVS 10 ATEX E 143 X |

IECEX

| | |
|----------------|--|
| Identification | [Ex ia Ga] IIC [Ex ia Da] IIIC Ex ec [ia Ga] IIC T4 Gc [Ex ia Ma] I |
| Certificate | IECEX BVS 10.0097X |

CCC / China-Ex

| | |
|--|----------------|
| | [Ex ia Ga] IIC |
|--|----------------|

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| | |
|----------------|-------------------------|
| Identification | [Ex ia Da] IIC |
| | Ex ec [ia Ga] IIC T4 Gc |
| Certificate | 2022122316115971 |

UL, USA/Canada

| | |
|----------------|--|
| Identification | IS for Class I,II,III, Division 1 and Zone 0 |
| | Installation in Class I, Division 2 and Zone 2 |
| Certificate | UL® C.D.-No 83104549 |

Shipbuilding approval

| | |
|-------------|-------------------|
| Certificate | DNV GL TAA000020C |
|-------------|-------------------|

Safety Integrity Level (SIL, IEC 61508)

| | |
|----------------|------------------------|
| Identification | 2 |
| Certificate | IN-AT-AS-MRL-23-00432A |

Systematic Capability

| | |
|----------------|---|
| Identification | 3 |
|----------------|---|

Performance Level (ISO 13849)

| | |
|----------------|-----------|
| Identification | d / KAT 2 |
|----------------|-----------|

INMETRO

| | |
|----------------|-------------------------|
| Identification | [Ex ia Ga] IIC |
| | [Ex ia Da] IIC |
| | Ex ec [ia Ga] IIC T4 Gc |
| | [Ex ia Ma] I |
| Certificate | DNV 18.0139 X |

Shipbuilding data

| | |
|-------------|---|
| Temperature | B |
| Humidity | B |
| Vibration | A |
| EMC | A |
| Enclosure | Required protection according to the Rules shall be provided upon installation on board |

EMC data

| | |
|-------------------------------|--|
| Electromagnetic compatibility | Conformance with EMC directive |
| Noise immunity | EN 61000-6-2 |
| Note | When being exposed to interference, there may be minimal deviations. |

Noise emission

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-6-4 |
|-----------------------|--------------|

Standards and regulations

GB Standard

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| | |
|-----------------------|-------------|
| Standards/regulations | GB/T 3836.1 |
| | GB/T 3836.3 |
| | GB/T 3836.4 |

Mounting

| | |
|---------------|-------------------|
| Mounting type | DIN rail mounting |
|---------------|-------------------|

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Drawings

Dimensional drawing



Diagram



Signal transmission analog and digital at the same time

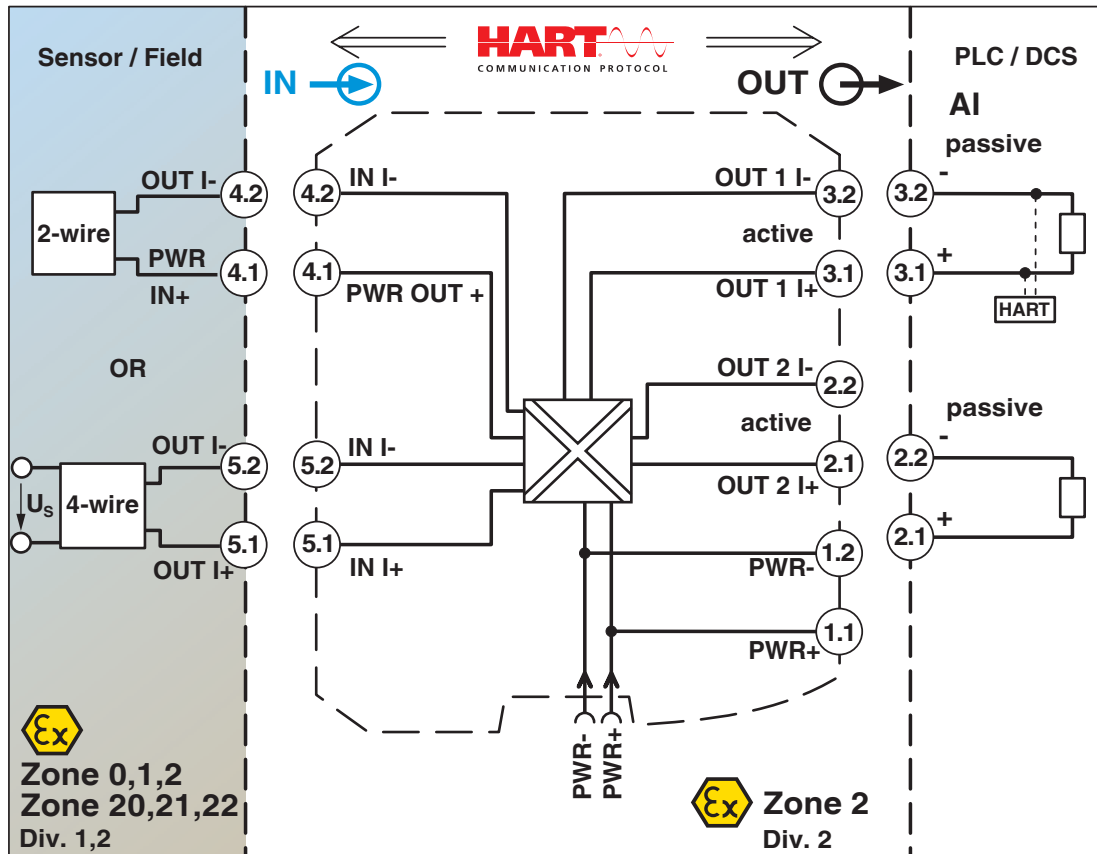
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Block diagram



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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2908856>

DNV

Approval ID: TAA000020C



UL Listed

Approval ID: E330267



cUL Listed

Approval ID: E330267

Functional Safety

Approval ID: BVS PB 13-10-04

TUEV Austria FS

Approval ID: INATAS-MRL-23-00432A

ECAS

Approval ID: 163685 E25 08 169500



EAC Ex

Approval ID: RU C-DE.AB72.B.00093



IECEx

Approval ID: IECEx BVS 10.0097X



CCC

Approval ID: 2022122316115971



cUL Listed

Approval ID: E199827



UL Listed

Approval ID: E199827

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ATEX

Approval ID: BVS 10 ATEX E143 X



ATEX

Approval ID: BVS 10 ATEX E143 X



IECEX

Approval ID: IECEX BVS 10.0097X

INMETRO

Approval ID: DNV 18.0139 X

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Classifications

ECLASS

| | |
|-------------|----------|
| ECLASS-13.0 | 27210120 |
| ECLASS-15.0 | 27210120 |

ETIM

| | |
|-----------|----------|
| ETIM 10.0 | EC002653 |
|-----------|----------|

UNSPSC

| | |
|-------------|----------|
| UNSPSC 21.0 | 39121000 |
|-------------|----------|

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Environmental product compliance

EU RoHS

| | |
|---|--------------------|
| Fulfills EU RoHS substance requirements | Yes |
| Exemption | 6(c), 7(a), 7(c)-I |

China RoHS

| | |
|--|---|
| Environment friendly use period (EFUP) | EFUP-50 |
| | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |

EU REACH SVHC

| | |
|-------------------------------------|--|
| REACH candidate substance (CAS No.) | Lead(CAS: 7439-92-1) |
| | 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol(CAS: 119-47-1) |
| | 2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol(CAS: 79-94-7) |
| SCIP | 4bc34208-53b2-46f7-bd1b-3a47ccff451e |

EF3.1 Climate Change

| | |
|---------|---------------|
| CO2e kg | 7.629 kg CO2e |
|---------|---------------|

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