

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



2908855

<https://www.phoenixcontact.com/us/products/2908855>

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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, Screw connection

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2908855       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | C430          |
| Product key                          | DK1211        |
| GTIN                                 | 4055626352190 |
| Weight per piece (including packing) | 255.3 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)<br>< 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 <sub>rms</sub>    |
| 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 <sub>rms</sub> |

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

|                          |                      |
|--------------------------|----------------------|
| Standards/regulations    | IEC/EN 60079-11      |
| Rated insulation voltage | 265 V <sub>rms</sub> |

### 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 <sub>rms</sub>                                       |
| 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 <sub>rms</sub>                  |
| 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                | Screw connection                            |
| Stripping length                 | 7 mm  |
| Screw thread                     | M3  |
| Conductor cross-section rigid    | 0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> |
| Conductor cross-section flexible | 0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> |
| Conductor cross-section AWG      | 24 ... 14                                   |
| Tightening torque                | 0.5 Nm ... 0.6 Nm                           |

## 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 $\mu$ F  |
| IIA (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$    | 26 mH / 2.9 $\mu$ 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 $\mu$ F, 0.005 mH / 2.9 $\mu$ F |
| IIB/IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 16 mH / 370 nF, 1 mH / 430 nF, 500 $\mu$ H / 510 nF, 200 $\mu$ H / 660 nF, 100 $\mu$ 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 $\mu$ H / 80 nF, 200 $\mu$ H / 107 nF                        |
| I (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$       | 37 mH / 0.54 $\mu$ F, 0.2 mH / 1.1 $\mu$ F, 10 $\mu$ H / 2.8 $\mu$ F, 0.001 mH / 4.15 $\mu$ F                |

## Safety data: Signal conditioner operation

|                     |               |
|---------------------|---------------|
| Input voltage $U_i$ | $\leq$ 30 V   |
| Input current $I_i$ | $\leq$ 150 mA |

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|                                      |            |
|--------------------------------------|------------|
| 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

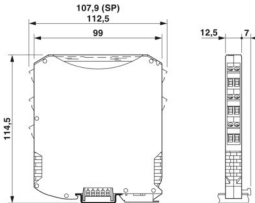
### Data communication (bypass)

|                     |                      |
|---------------------|----------------------|
| 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              | 112.5 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 ( $\leq 2000$ m)

|          |   |
|----------|---|
| Altitude | $\leq 2000$ m (The technical data refers to altitudes $\leq 2000$ m above mean sea level. For altitudes $>2000$ m above mean sea level, refer to the data sheet.) |
|----------|---|

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|                                 |  |
|---------------------------------|--|
| Ambient temperature (operation) | -40 °C ... 60 °C                                   |
|                                 | -40 °C ... 70 °C (Derating)                        |
| Rated insulation voltage        | 375 V <sub>PP</sub> (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

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

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|             |                  |
|-------------|------------------|
| 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] IIIC         |
|                | 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

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

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|  |             |
|--|-------------|
|  | GB/T 3836.4 |
|--|-------------|

## Mounting

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

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



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## Drawings

Dimensional drawing



Diagram



Signal transmission analog and digital at the same time

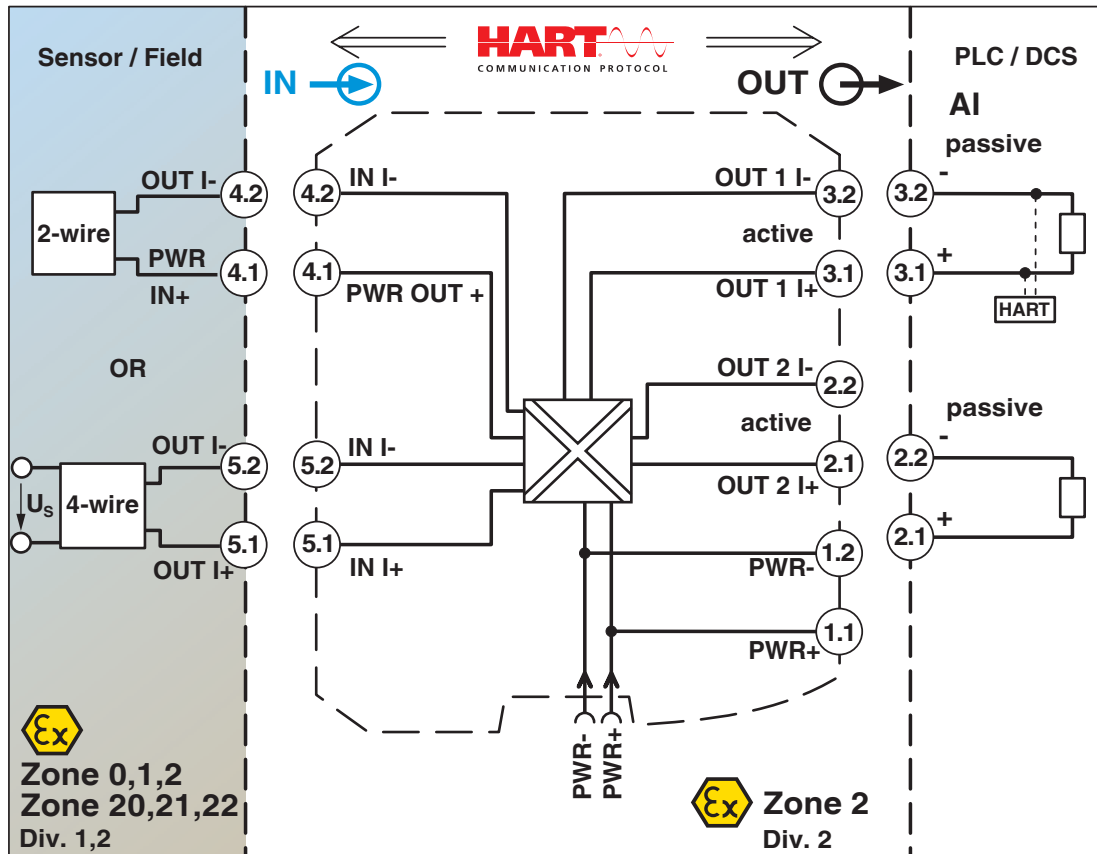
# MACX MCR-EX-SL-RPSSI-2I-1S - Repeater power supply



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Block diagram



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



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2908855>

### 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

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



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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                                | 96051cbb-ba12-447a-aefd-d670c19f0f27                           |

### EF3.1 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 7.288 kg CO2e |
|---------|---------------|

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