

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

Please be informed that the data shown in this PDF document is generated from our online catalog. Please find the complete data in the user documentation. Our general terms of use for downloads are valid.



Ex i repeater power supply and input signal conditioner, HART-transparent. Transmits supplied or active 0/4 ... 20 mA signals from the Ex area to a load (active or passive) in the safe area. SIL 2 (1oo1) / SIL 3 (1oo2), wide-range supply.

## Your advantages

- 250  $\Omega$  resistor that can be activated via DIP switches to increase HART impedance for low-resistance systems
- Up to SIL 2 in accordance with EN 61508
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- Wide-range power supply of 19.2 ... 253 V AC/DC
- 3-way electrical isolation
- Plug-in screw or spring-cage connection technology (Push-in technology), with integrated sockets for HART communicators
- 0/4 ... 20 mA input, [Ex ia] IIC (powered or not powered)
- Bidirectional transmission of digital HART communication signals
- 0/4 ... 20 mA output (active or passive), 0/1 ... 5 V, can be selected via DIP switches

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2924029       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | C430          |
| Product key                          | DK1211        |
| GTIN                                 | 4046356338172 |
| Weight per piece (including packing) | 189.2 g       |
| Weight per piece (excluding packing) | 147.1 g       |
| Customs tariff number                | 85437090      |
| Country of origin                    | DE            |

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

## Technical data

### Product properties

|                 |                       |
|-----------------|-----------------------|
| Product type    | Repeater power supply |
| Product family  | MACX Analog           |
| Application     | Analog IN             |
| No. of channels | 1                     |
| Configuration   | DIP switches          |

### Electrical properties

|                                               |                                         |
|-----------------------------------------------|-----------------------------------------|
| Electrical isolation                          | 3-way isolation                         |
| Electrical isolation between input and output | yes                                     |
| Step response (10-90%)                        | < 600 $\mu$ s (for 4 mA ... 20 mA step) |
| Maximum temperature coefficient               | < 0.01 %/K                              |
| Maximum transmission error                    | < 0.1 % (of final value)                |
| Transmission error, typical                   | < 0.05 % (of final value)               |

#### Electrical isolation

|                      |                         |
|----------------------|-------------------------|
| Test voltage         | 2.5 kV AC (50 Hz, 60 s) |
| 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> |
| 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/supply IEC/EN 60079-7

|                          |                      |
|--------------------------|----------------------|
| Standards/regulations    | IEC/EN 60079-7       |
| Rated insulation voltage | 265 V <sub>rms</sub> |

### Supply

|                              |                                                       |
|------------------------------|-------------------------------------------------------|
| Designation                  | Repeater power supply operation                       |
| Nominal supply voltage range | 24 V AC/DC ... 230 V AC/DC -20 % ... +10 % (50/60 Hz) |
| Supply voltage range         | 19.2 V AC/DC ... 253 V AC/DC (50/60 Hz)               |
| Max. current consumption     | < 80 mA (24 V DC / 20 mA)                             |
| Power dissipation            | < 1.6 W (24 V DC / 20 mA)                             |
| Power consumption            | < 2.2 W                                               |

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

## Supply

| Designation                  | Signal conditioner operation                          |
|------------------------------|-------------------------------------------------------|
| Nominal supply voltage range | 24 V AC/DC ... 230 V AC/DC -20 % ... +10 % (50/60 Hz) |
| Supply voltage range         | 19.2 V AC/DC ... 253 V AC/DC (50/60 Hz)               |
| Max. current consumption     | < 45 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   | Active current input, intrinsically safe |
| Number of inputs           | 1                                        |
| Current input signal       | 4 mA ... 20 mA                           |
| Transmitter supply voltage | > 16 V (20 mA)<br>> 15.3 V (22.5 mA)     |

### Signal: Signal conditioner operation

|                          |                                                  |
|--------------------------|--------------------------------------------------|
| Description of the input | Passive current input, intrinsically safe        |
| Current input signal     | 0 mA ... 20 mA<br>4 mA ... 20 mA                 |
| Voltage drop             | < 3.5 V (in input isolating amplifier operation) |

## Output data

### Signal: Repeater power supply operation

|                                          |                                                                                         |
|------------------------------------------|-----------------------------------------------------------------------------------------|
| Output description                       | Current output (active and passive)                                                     |
| Number of outputs                        | 1                                                                                       |
| Voltage output signal                    | 1 V ... 5 V (internal resistance, 250 $\Omega$ , 0.1%)<br>Configurable via DIP switches |
| Current output signal                    | 4 mA ... 20 mA (active)<br>4 mA ... 20 mA (14 ... 26 V ext. source voltage)             |
| Load/output load current output          | < 600 $\Omega$ (20 mA)<br>< 525 $\Omega$ (22.5 mA)                                      |
| Output ripple                            | < 20 mV <sub>rms</sub>                                                                  |
| Output behavior in the event of an error | 0 mA (Cable break in the input)<br>$\geq$ 22.5 mA (Cable short-circuit in the input)    |

### Signal: Signal conditioner operation

|                                 |                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output description              | Current output (active and passive)                                                                                                                        |
| Voltage output signal           | 0 V ... 5 V (internal resistance, 250 $\Omega$ , 0.1%)<br>1 V ... 5 V (internal resistance, 250 $\Omega$ , 0.1%)                                           |
| Current output signal           | 0 mA ... 20 mA (active)<br>4 mA ... 20 mA (active)<br>0 mA ... 20 mA (14 ... 26 V ext. source voltage)<br>4 mA ... 20 mA (14 ... 26 V ext. source voltage) |
| Load/output load current output | < 600 $\Omega$ (20 mA)                                                                                                                                     |

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

|                                          |                                         |
|------------------------------------------|-----------------------------------------|
|                                          | < 525 $\Omega$ (22.5 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) |

## Connection data

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Connection method                                                       | Push-in connection                                                                  |
| Stripping length                                                        | 10 mm                                                                               |
| 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 flexible (2 conductors with same cross section) | 0.25 mm <sup>2</sup> ... 0.34 mm <sup>2</sup> (TWIN ferrule without plastic sleeve) |
|                                                                         | 0.5 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> (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)                                        |

## 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/DC (Supply terminals)                                                                               |
|                                                                                            | 253 V AC (Output terminals)                                                                                  |
|                                                                                            | 125 V DC (Output terminals)                                                                                  |
| 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/III (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 16 mH / 370 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, 0.35 mH / 1 $\mu$ F, 0.009 mH / 2.9 $\mu$ F, 0.001 mH / 4.15 $\mu$ F                   |

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

## Safety data: Signal conditioner operation

|                                      |                                |
|--------------------------------------|--------------------------------|
| Input voltage $U_i$                  | $\leq 30\text{ V}$             |
| Input current $I_i$                  | $\leq 150\text{ mA}$           |
| Max. internal inductance $L_i$       | negligible                     |
| Max. internal capacitance $C_i$      | negligible                     |
| Safety-related maximum voltage $U_m$ | 253 V AC/DC (Supply terminals) |
|                                      | 253 V AC (Output terminals)    |
|                                      | 125 V DC (Output terminals)    |

## Interfaces

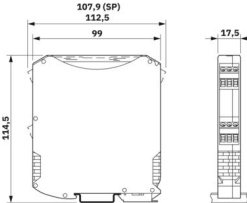
### Data communication (bypass)

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

## Signaling

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

## Dimensions

|                     |                                                                                      |
|---------------------|--------------------------------------------------------------------------------------|
| Dimensional drawing |  |
| Width               | 17.5 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)           |

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

## 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.) |
| Ambient temperature (operation) | -40 °C ... 60 °C<br>-40 °C ... 70 °C (Derating)                                                                                                                    |
| Rated insulation voltage        | 375 V <sub>PP</sub> (Power supply, input / output)                                                                                                                 |

## Altitude range ( $\leq 3000$ m)

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

## Altitude range ( $\leq 4000$ m)

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

## Altitude range ( $\leq 5000$ m)

|                                 |                                                 |
|---------------------------------|-------------------------------------------------|
| Height range                    | $> 4000$ m ... 5000 m                           |
| Ambient temperature (operation) | -40 °C ... 42 °C<br>-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 | <div> <div>Ex</div> <div>II (1) G [Ex ia Ga] IIC</div> </div> <div> <div>Ex</div> <div>II (1) D [Ex ia Da] IIIC</div> </div> <div> <div>Ex</div> <div>II 3(1) G Ex ec [ia Ga] IIC T4 Gc</div> </div> <div> <div>Ex</div> <div>I (M1) [Ex ia Ma] I</div> </div> |
| Certificate    | BVS 08 ATEX E 094 X                                                                                                                                                                                                                                            |

### IECEx

|                |                                                                                                                 |
|----------------|-----------------------------------------------------------------------------------------------------------------|
| Identification | <div>[Ex ia Ga] IIC</div> <div>[Ex ia Da] IIIC</div> <div>Ex ec [ia Ga] IIC T4 Gc</div> <div>[Ex ia Ma] I</div> |
| Certificate    | IECEx BVS 08.0035X                                                                                              |

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

## CCC / China-Ex

|                |                         |
|----------------|-------------------------|
| Identification | [Ex ia Ga] IIC          |
|                | [Ex ia Da] IIIC         |
|                | Ex ec [ia Ga] IIC T4 Gc |
| Certificate    | 2022122316115974        |

## UL, USA/Canada

|                |                                              |
|----------------|----------------------------------------------|
| Identification | Class I Div 2; IS for Class I, II, III Div 1 |
| Certificate    | UL C.D.-No 83104549                          |

## Safety Integrity Level (SIL / SILCL, IEC 61508)

|                |            |
|----------------|------------|
| Identification | 2          |
| Certificate    | ZP/C031/20 |

## Systematic Capability (SC / SILCL)

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

## INMETRO

|                |                         |
|----------------|-------------------------|
| Identification | [Ex ia Ga] IIC          |
|                | [Ex ia Da] IIIC         |
|                | Ex ec [ia Ga] IIC T4 Gc |
| Certificate    | DNV 18.0138 X           |

## 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 |
|-----------------------|--------------|

## Electromagnetic HF field

|                                                        |                          |
|--------------------------------------------------------|--------------------------|
| Designation                                            | Electromagnetic RF field |
| Standards/regulations                                  | EN 61000-4-3             |
| Typical deviation from the measuring range final value | 1 %                      |

## Fast transients (burst)

|                                                        |                         |
|--------------------------------------------------------|-------------------------|
| Designation                                            | Fast transients (burst) |
| Standards/regulations                                  | EN 61000-4-4            |
| Typical deviation from the measuring range final value | 1 %                     |

## Conducted interference

|                                                        |                         |
|--------------------------------------------------------|-------------------------|
| Designation                                            | Conducted interferences |
| Standards/regulations                                  | EN 61000-4-6            |
| Typical deviation from the measuring range final value | 1 %                     |

## Standards and regulations

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

|                      |                 |
|----------------------|-----------------|
| Electrical isolation | 3-way isolation |
|----------------------|-----------------|

## GB Standard

|                       |              |
|-----------------------|--------------|
| Standards/regulations | GB/T 3836.1  |
|                       | GB/T 3836.3  |
|                       | GB/T 3836.4  |
|                       | GB/T 16935.1 |

## Mounting

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

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply

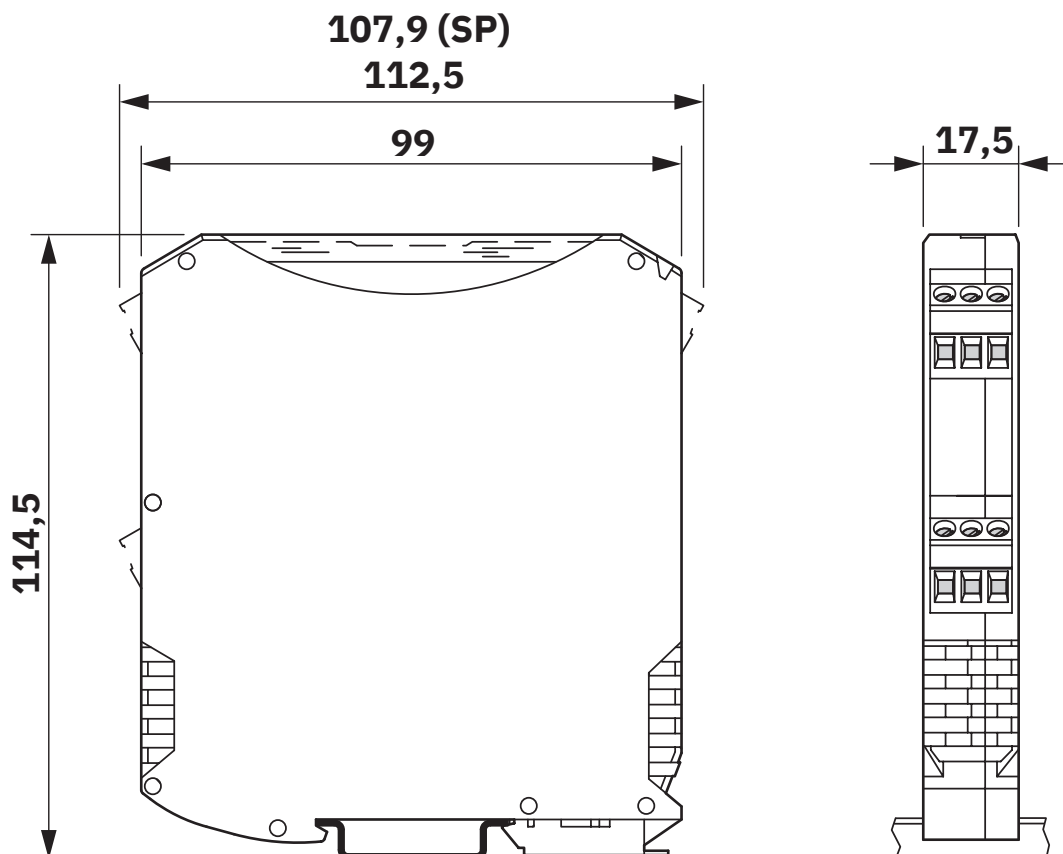


2924029

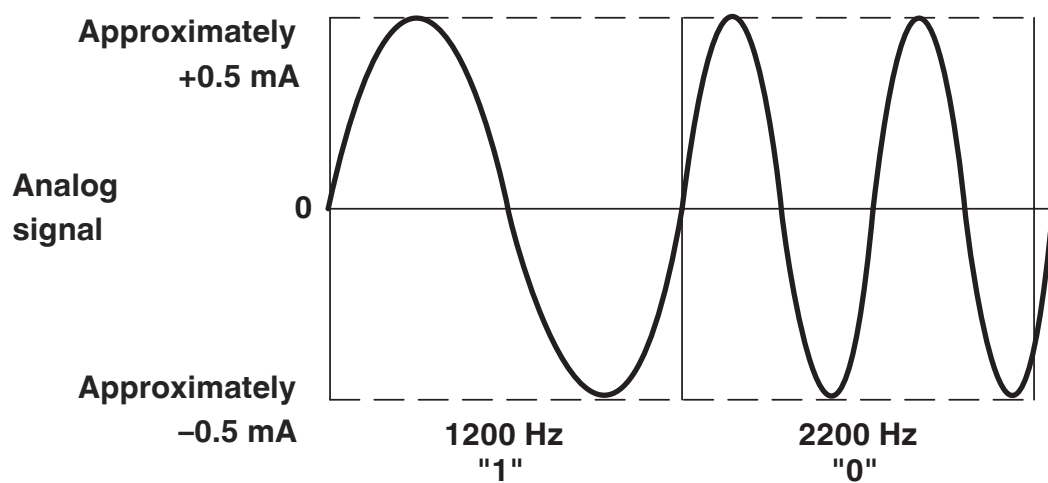
<https://www.phoenixcontact.com/us/products/2924029>

## Drawings

Dimensional drawing



Diagram



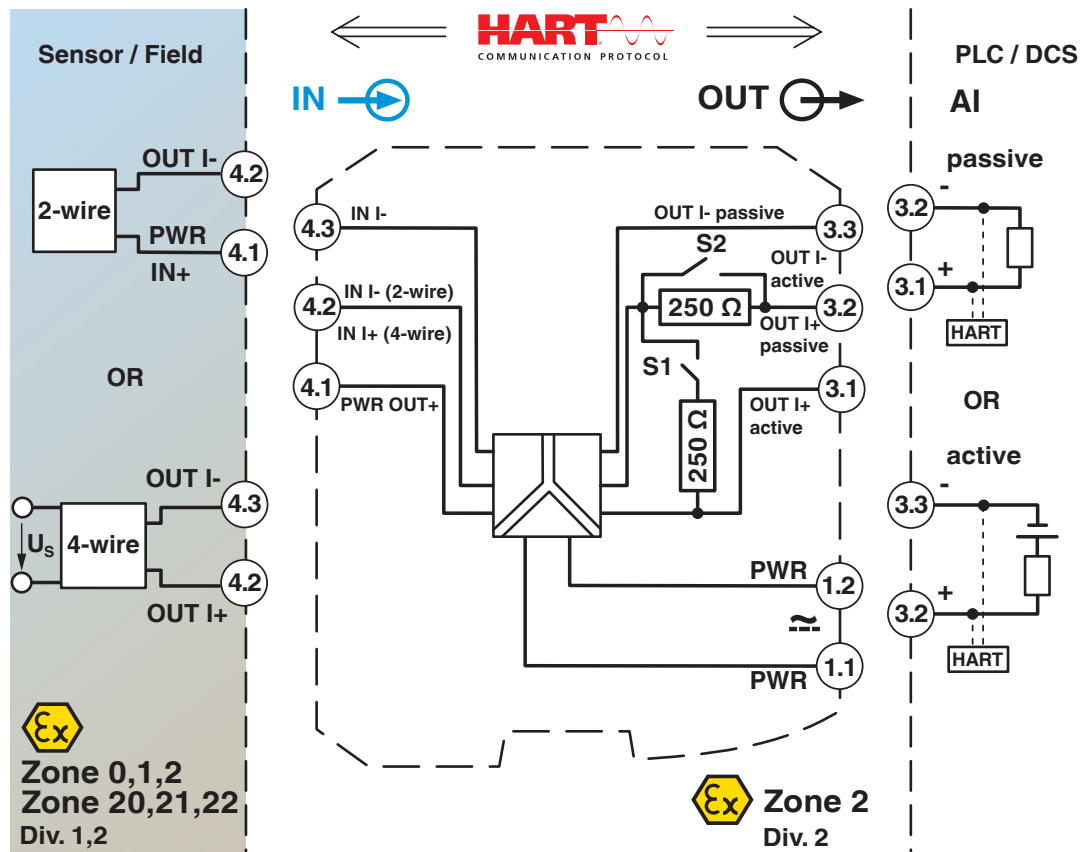
Signal transmission analog and digital at the same time

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply

2924029

<https://www.phoenixcontact.com/us/products/2924029>

Block diagram



# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2924029>



### UL Listed

Approval ID: E330267



### cUL Listed

Approval ID: E330267

### Functional Safety

Approval ID: BVS PB 09/08



### EAC Ex

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



### IECEx

Approval ID: IECEx BVS 08.0035X



### cUL Listed

Approval ID: E199827



### UL Listed

Approval ID: E199827



### ATEX

Approval ID: BVS 08 ATEX E094 X

### INMETRO

Approval ID: DNV 18.0138 X



### CCC

Approval ID: 2022122316115974

### INMETRO

Approval ID: DNV 18.0138 X

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029  
<https://www.phoenixcontact.com/us/products/2924029>

## Classifications

### ECLASS

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

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC002653 |
|----------|----------|

### UNSPSC

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

# MACX MCR-EX-SL-RPSSI-I-UP-SP - Repeater power supply



2924029

<https://www.phoenixcontact.com/us/products/2924029>

## 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)                 |
| SCIP                                | 367c4dc0-fbc8-4db5-b70d-89c229ca3ff9 |

Phoenix Contact 2025 © - all rights reserved

<https://www.phoenixcontact.com>

Phoenix Contact USA  
586 Fulling Mill Road  
Middletown, PA 17057, United States  
(+717) 944-1300  
[info@phoenixcon.com](mailto:info@phoenixcon.com)