

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



2924236

<https://www.phoenixcontact.com/us/products/2924236>

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Ex i measuring transducer power supply and input signal conditioner, HART-transparent. Transfers supplied or active 0/4 mA ... 20 mA electrical isolation signals from the Ex area to two loads in the safe area. 4-way electrical isolation, Push-in connection, SIL, PL.

Your advantages

- 0/4 mA ... 20 mA input, intrinsically safe, [Ex ia], powered and not powered
- Measuring transducer supply voltage > 16 V
- Two electrically isolated 0/4 mA ... 20 mA (active) outputs
- Bidirectional HART transmission (both outputs)
- Error indication according to NAMUR NE 43
- SIL 2 according to IEC/EN 61508
- Safe electrical isolation between input, outputs, and supply
- Power supply possible via DIN rail connector
- Installation in zone 2 permitted
- Plug-in connection terminals, push-in connection technology
- Housing width: 12.5 mm
- Minimal power dissipation
- High transmission accuracy

Commercial data

Item number	2924236
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C430
Product key	CK3111
Catalog page	Page 143 (C-5-2019)
GTIN	4046356463676
Weight per piece (including packing)	235 g
Weight per piece (excluding packing)	165 g
Customs tariff number	85437090
Country of origin	DE

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Technical data

Product properties

Product type	Repeater power supplies
Product family	MACX Analog
No. of channels	1
Type	Ex i signal conditioners with SIL and PL Functional Safety

Data management status

Article revision	12
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Electrical properties

Electrical isolation	3-way isolation
Electrical isolation between input and output	yes
Signal transmission behavior	In = Out
Step response (10-90%)	1.3 ms (for jump 4 mA ... 20 mA, typical)
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)
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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)

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Power dissipation	< 1.45 W (24 V DC / 20 mA)
Power consumption	≤ 1.8 W

Supply

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	< 1.2 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	< 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)

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	< 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)
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)

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

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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
	125 V DC

Interfaces

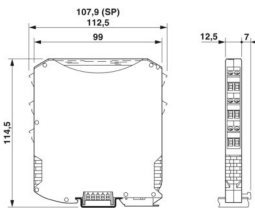
Data communication (bypass)

HART function	Yes
Protocols supported	HART-transparent

Signaling

Status display	Green LED (supply voltage)
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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	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 ($\leq 2000\text{ m}$)

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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

UL, USA/Canada

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

Shipbuilding approval

Certificate	DNV GL TAA000020C
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Safety Integrity Level (SIL, IEC 61508)

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

Systematic Capability

Identification	3
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Performance Level (ISO 13849)

Identification	d / KAT 2
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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

DNV GL 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

Noise immunity	EN 61000-6-2
Note	When being exposed to interference, there may be minimal deviations.
Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4

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Standards and regulations

Electrical isolation	3-way isolation
GB Standard	
Standards/regulations	GB/T 3836.1
	GB/T 3836.3
	GB/T 3836.4

Mounting

Mounting type	DIN rail mounting
Thread type	()

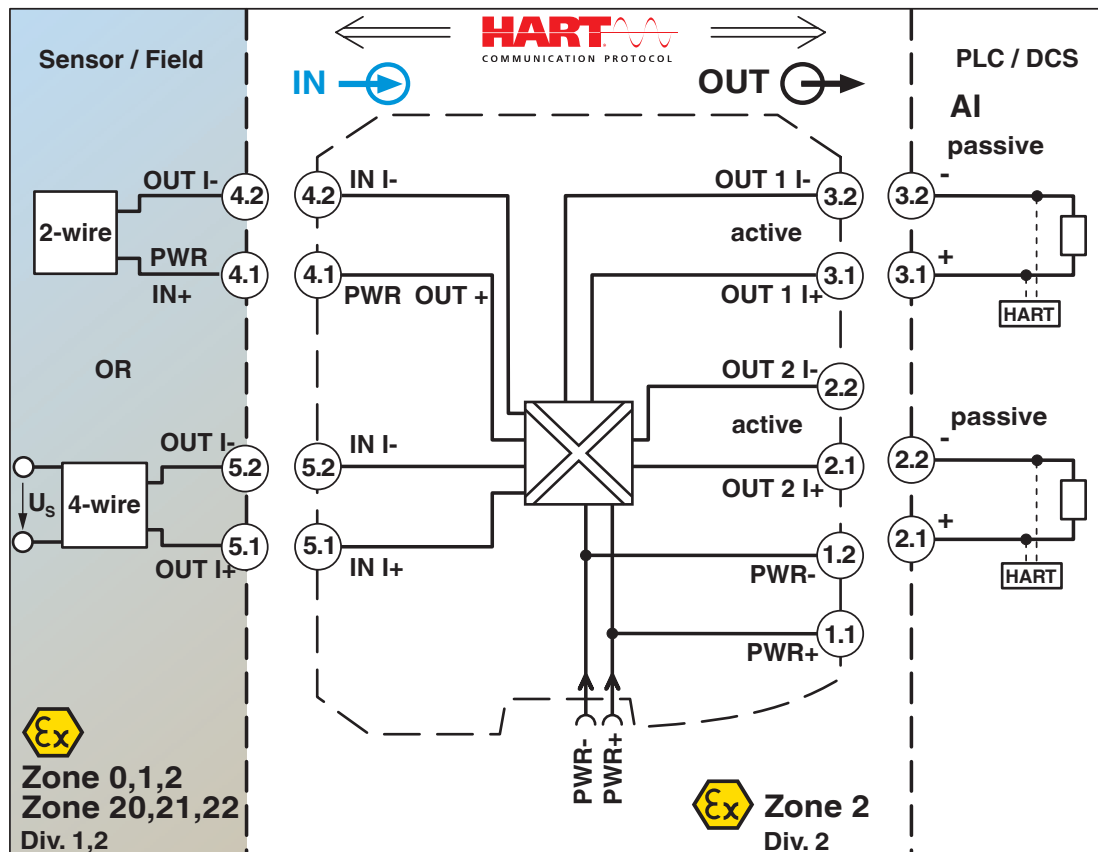
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Drawings

Block diagram



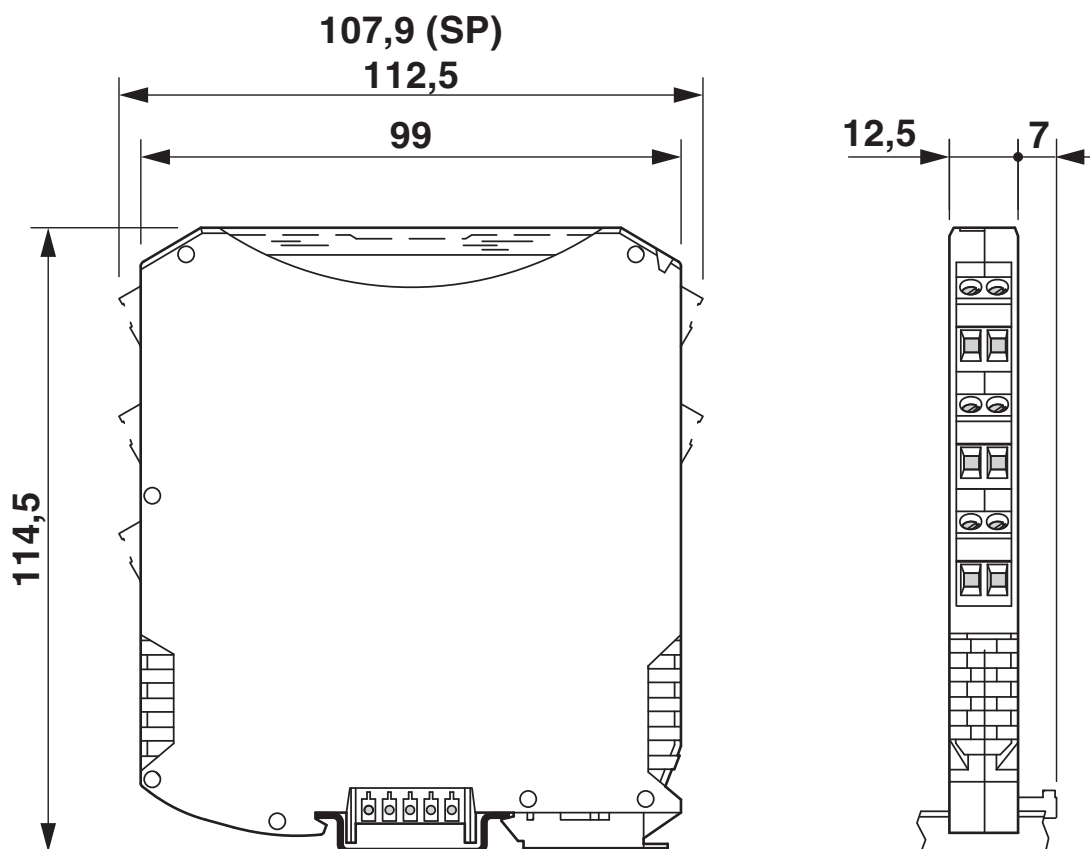
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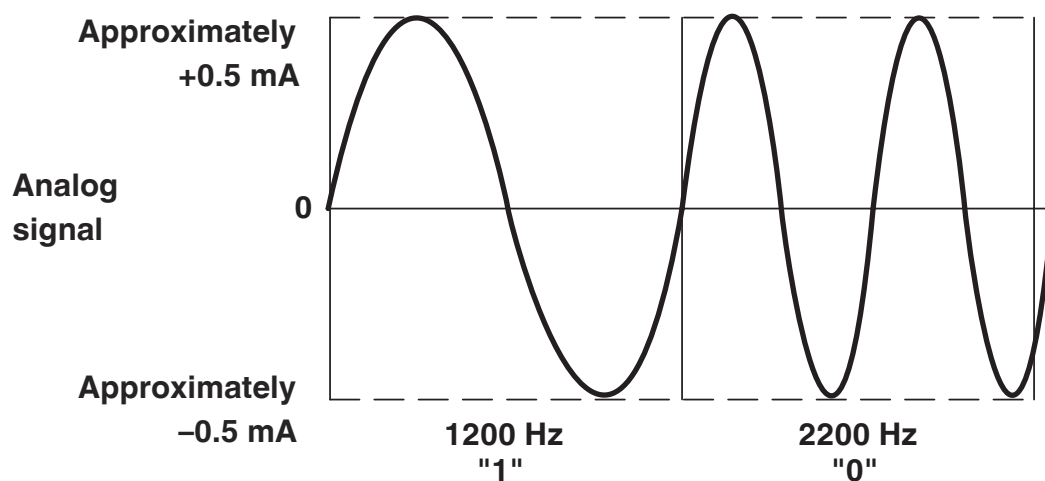
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Dimensional drawing



Diagram



Signal transmission analog and digital at the same time

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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2924236>



DNV GL

Approval ID: TAA000020C



UL Listed

Approval ID: E330267



cUL Listed

Approval ID: E330267

Functional Safety

Approval ID: BVS PB 13-10-04



EAC Ex

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



IECEx

Approval ID: IECEx BVS 10.0097X



cUL Listed

Approval ID: E199827



UL Listed

Approval ID: E199827



ATEX

Approval ID: BVS 10 ATEX E143 X

INMETRO

Approval ID: DNV 18.0139 X



ATEX

Approval ID: BVS 10 ATEX E143 X

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IECEx

Approval ID: IECEx BVS 10.0097X



CCC

Approval ID: 2022122316115971

cULus Listed

cULus Listed

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Classifications

ECLASS

ECLASS-11.0	27210120
ECLASS-12.0	27210120
ECLASS-13.0	27210120

ETIM

ETIM 9.0	EC002653
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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)
SCIP	29ac425e-4034-45b5-8db9-b0b6b03d23be

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