

# MACX MCR-EX-SL-UI-REL-SP - Limit value switch



2906165

<https://www.phoenixcontact.com/us/products/2906165>

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Limit value switch with Ex i input for active current and voltage signals and a limit-value relay output (changeover contact). Can be set via DIP switch and potentiometer, galvanic 3-way electrical isolation, up to SIL2 (SC3), PLc Cat.1, Push-in connection.

## Commercial data

Item number	2906165
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C430
Product key	DK1217
GTIN	4055626043739
Weight per piece (including packing)	250 g
Weight per piece (excluding packing)	268.2 g
Customs tariff number	85437090
Country of origin	DE

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## Technical data

### Product properties

Product type	Limit value switch
Product family	MACX Analog
Configuration	DIP switches
	Potentiometer

### System properties

#### Functionality

Configuration	DIP switches
	Potentiometer

### Electrical properties

Electrical isolation	3-way isolation
Electrical isolation between input and output	yes
Switching point accuracy	< 0.1 %
Step response (0–99%)	≤ 22 ms
Maximum temperature coefficient	0.01 %/K
Maximum transmission error	0.1 %

#### Electrical isolation

Test voltage	2.5 kV AC (50 Hz, 60 s)
Overvoltage category	II
Pollution degree	2

#### Electrical isolation Output/supply IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	250 V AC

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

Standards/regulations	IEC/EN 61010-1
Rated insulation voltage	300 V AC
Insulation	Safe isolation

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

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V AC

### Supply

Nominal supply voltage range	12 V DC ... 24 V DC -20 % ... +25 %
Supply voltage range	9.6 V DC ... 30 V DC
Typical current consumption	38 mA (24 V DC)
Max. current consumption	90 mA (10 V DC)
Power dissipation	< 0.9 W

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Power consumption	$\leq 1.2 \text{ W}$
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## Input data

Signal: Voltage/current

Description of the input	intrinsically safe
Voltage input signal	0.1 V ... 10 V 0.1 V ... 10.5 V (Maximum range)
Total error of the voltage input maximum	$\pm 10 \text{ mV}$
Current input signal	0.2 mA ... 20 mA 0.18 mA ... 21 mA (Maximum range)
Total error of the current input maximum	$\pm 20 \mu\text{A}$
Input resistance of voltage input	$> 100 \text{ k}\Omega$
Input resistance current input	$< 28 \Omega$
Switching threshold "0" signal current	Configurable via DIP switch (in 1.25% increments) and potentiometer (linearly up to 2% of the switching threshold set via the DIP switch)
Switching hysteresis	off: approx. 0.5 %, on: approx. 1 %
Line fault detection	$< 0.1 \text{ mA}$ (Line break) $> 21.1 \text{ mA}$ (Short circuit)

## Output data

Switching: Relay

Contact switching type	1 changeover contact
Contact material	AgSnO <sub>2</sub> , hard gold-plated
Max. switching current	$\leq 4 \text{ A AC}$ ( $\cos \phi = 1$ ) $\leq 1 \text{ A DC}$ (ohmic load, 24 V DC, 50 mW) $\leq 0.2 \text{ A DC}$ (ohmic load, 120 V DC)

## 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)

Test socket

Max. diameter	2 mm
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## Ex data

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

## Safety data

Input voltage $U_i$	30 V (Current and voltage input)
Input current $I_i$	120 mA (Current and voltage input)
Input power $P_i$	0.9 W (Current and voltage input)
Max. internal inductance $L_i$	negligible
Max. internal capacitance $C_i$	75 nF (for current input)
	Negligible at voltage input
Max. output voltage $U_o$	0 V DC (Current input)
	3.9 V DC (Voltage input)
Max. output current $I_o$	0 mA (Current input)
	0.1 mA (Voltage input)
Max. output power $P_o$	0 mW (Current input)
	0.5 mW (Voltage input)
Safety-related maximum voltage $U_m$	253 V AC
	125 V DC
IIC: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 3.3 $\mu$ F, 5 mH / 4.7 $\mu$ F, 1 mH / 6.3 $\mu$ F
IIB/IIIC: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 16 $\mu$ F, 5 mH / 24 $\mu$ F, 1 mH / 35 $\mu$ F
IIA/I: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 24 $\mu$ F, 5 mH / 35 $\mu$ F, 1 mH / 48 $\mu$ F

## Signaling

Status display	Green LED (supply voltage)
	Yellow LED (switching output)
	Red LED, flashing (line, sensor error, ERR)

## 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

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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
Ambient temperature (operation)	-20 °C ... 65 °C (Any mounting position)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Altitude	≤ 2000 m
Permissible humidity (operation)	5 % ... 95 % (non-condensing)

## 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 nC [ia Ga] IIC T4 Gc
	Ⓜ I (M1) [Ex ia Ma] I
Certificate	TÜV 17 ATEX 8061 X

### IECEX

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec nC [ia Ga] IIC T4 Gc
Certificate	IECEX TUR 18.0014X

### CCC / China-Ex

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec nC [ia Ga] IIC T4 Gc
Certificate	2022122316115960

### UL, USA/Canada

Identification	UL 61010 Listed
	Class I Div 2; IS for Class I, II, III Div 1
Certificate	Ⓜ.Ⓜ. C.D.-No 83104549

### Shipbuilding approval

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

Identification	2
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Certificate	TÜV Rheinland 968/FSP 1481.01/23
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## Systematic Capability

Identification	3
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## Performance Level (ISO 13849)

Identification	c
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## INMETRO

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec nC [ia Ga] IIC T4 Gc
Certificate	DNV 21.0089 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
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## Standards and regulations

Electrical isolation	3-way isolation
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## GB Standard

Standards/regulations	GB/T 3836.1
	GB/T 3836.3
	GB/T 3836.4
	GB/T 3836.8

## Mounting

Mounting type	DIN rail mounting
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# MACX MCR-EX-SL-UI-REL-SP - Limit value switch

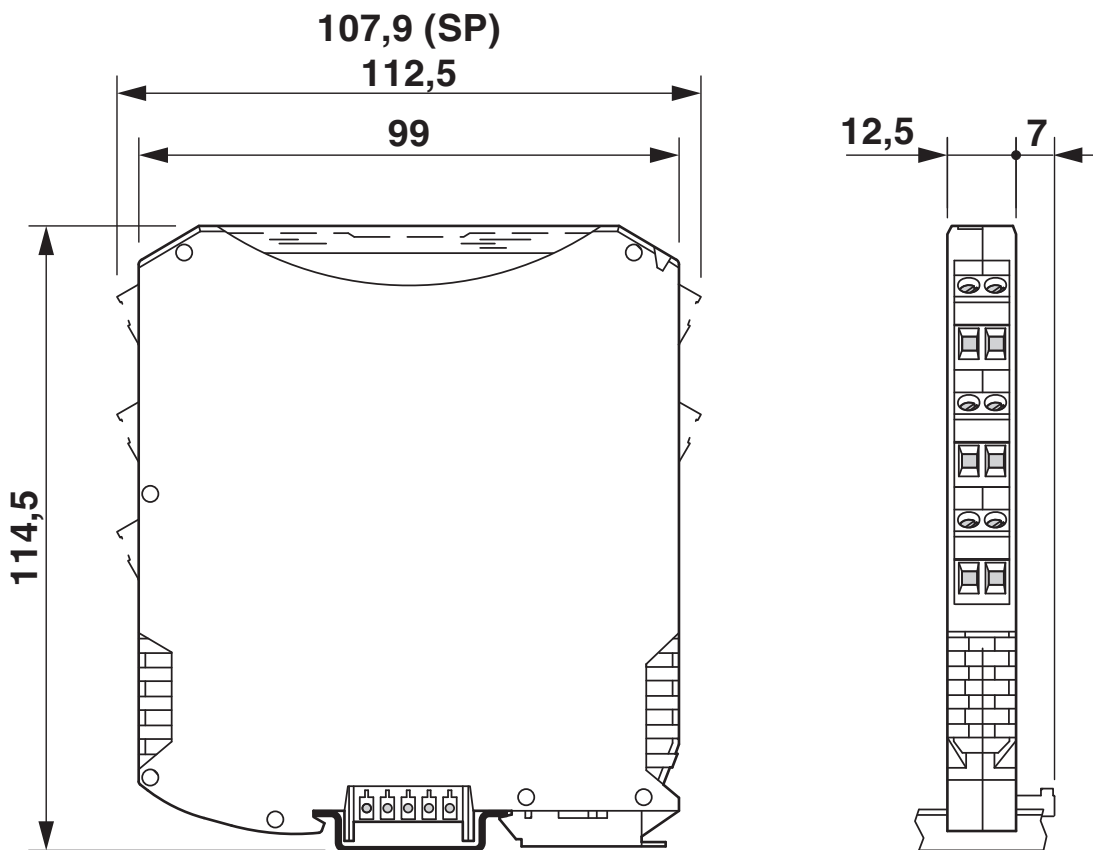


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## Drawings

Dimensional drawing



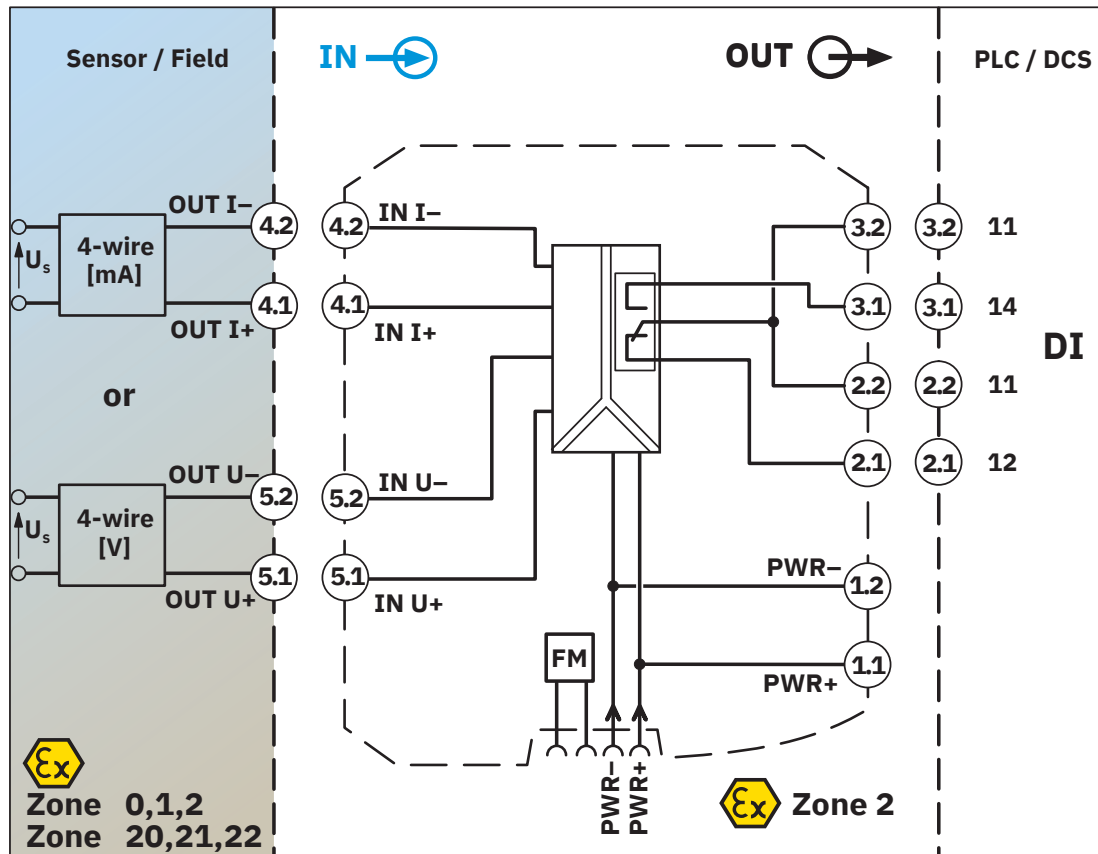
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Block diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2906165>

### DNV

Approval ID: TAA000020C



### UL Listed

Approval ID: E330267



### cUL Listed

Approval ID: FILE E 330267



### Functional Safety

Approval ID: 968/FSP 1481.00/17



### EAC Ex

Approval ID: RU C-DE.HB49.B.00145



### IECEX

Approval ID: IECEX TUR 18.0014X



### CCC

Approval ID: 2022122316115960



### cUL Listed

Approval ID: FILE E 199827



### UL Listed

Approval ID: E199827

### INMETRO

Approval ID: DNV 21.0089 X



### ATEX

Approval ID: TÜV 17 ATEX 8061 X

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## Classifications

### ECLASS

ECLASS-13.0	27210120
ECLASS-15.0	27210120

### ETIM

ETIM 10.0	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)
	2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol(CAS: 79-94-7)
SCIP	bed41982-a3f6-4478-8b70-ffe4d6d0d782

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