

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



2906165

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

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.



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
Product key	CK3143
Catalog page	Page 168 (C-5-2019)
GTIN	4055626043739
Weight per piece (including packing)	268.2 g
Weight per piece (excluding packing)	268.2 g
Customs tariff number	85437090
Country of origin	DE

Technical data

Product properties

Product type	Limit value switch
Product family	MACX Analog
Type	Ex i signal conditioners with SIL and PL Functional Safety
Configuration	DIP switches
	Potentiometer

Data management status

Article revision	05
------------------	----

Insulation characteristics: GB Standard

Overvoltage category	II
Pollution degree	2

System properties

Functionality

Configuration	DIP switches
	Potentiometer

Electrical properties

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

Electrical isolation Output/supply

Rated insulation voltage	250 V AC (IEC/EN 60079-11)
--------------------------	----------------------------

Electrical isolation Input/output/power supply

Rated insulation voltage	300 V AC (EN 61010-1)
Test voltage	2.5 kV AC (50 Hz, 60 s)
Insulation	Safe isolation in accordance with IEC/EN 61010-1

Electrical isolation Input/output, power supply

Rated insulation voltage	375 V AC (IEC/EN 60079-11)
--------------------------	----------------------------

Supply

Nominal supply voltage	24 V DC
Supply voltage range	9.6 V DC ... 30 V DC (12 V DC ... 24 V DC (-20 % ... +25 %))
Typical current consumption	38 mA (24 V DC)
Max. current consumption	90 mA (10 V DC)
Power dissipation	< 0.9 W
Power consumption	≤ 1.2 W

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	± 10 mV
Current input signal	0.2 mA ... 20 mA
	0.18 mA ... 21 mA (Maximum range)
Total error of the current input maximum	± 20 µA
Input resistance of voltage input	> 100 kΩ
Input resistance current input	< 28 Ω
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 mA (Line break)
	> 21.1 mA (Short circuit)

Output data

Switching: Relay

Contact switching type	1 changeover contact
Contact material	AgSnO ₂ , hard gold-plated
Max. switching current	≤ 4 A AC (cos phi = 1)
	≤ 1 A DC (ohmic load, 24 V DC, 50 mW)
	≤ 0.2 A DC (ohmic load, 120 V DC)

Connection data

Connection method	Push-in connection
Stripping length	8 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 AWG	24 ... 14

Test socket

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

Ex data

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

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



2906165

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

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	900 mW (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 μ F, 5 mH / 4.7 μ F, 1 mH / 6.3 μ F
IIB/IIIC: Max. external inductivity L_o / Max. external capacitance C_o	100 mH / 16 μ F, 5 mH / 24 μ F, 1 mH / 35 μ 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	116 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

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



2906165

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

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
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

UKCA Ex (UKEX)

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 22 UKEX 7081 X

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
-------------	-------------------

Safety Integrity Level (SIL, IEC 61508)

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



2906165

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

Identification	2
Certificate	TÜV Rheinland 968/FSP 1481.01/23
Note	Single-channel

Safety Integrity Level (SIL, IEC 61508)

Identification	3
Certificate	TÜV Rheinland 968/FSP 1481.01/23
Note	Two-channel

Systematic Capability

Identification	3
----------------	---

Performance Level (ISO 13849)

Identification	c
----------------	---

INMETRO

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

Standards and regulations

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

GB Standard

Standards/regulations	GB 3836.1
	GB 3836.3
	GB 3836.4
	GB 3836.8

Mounting

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

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

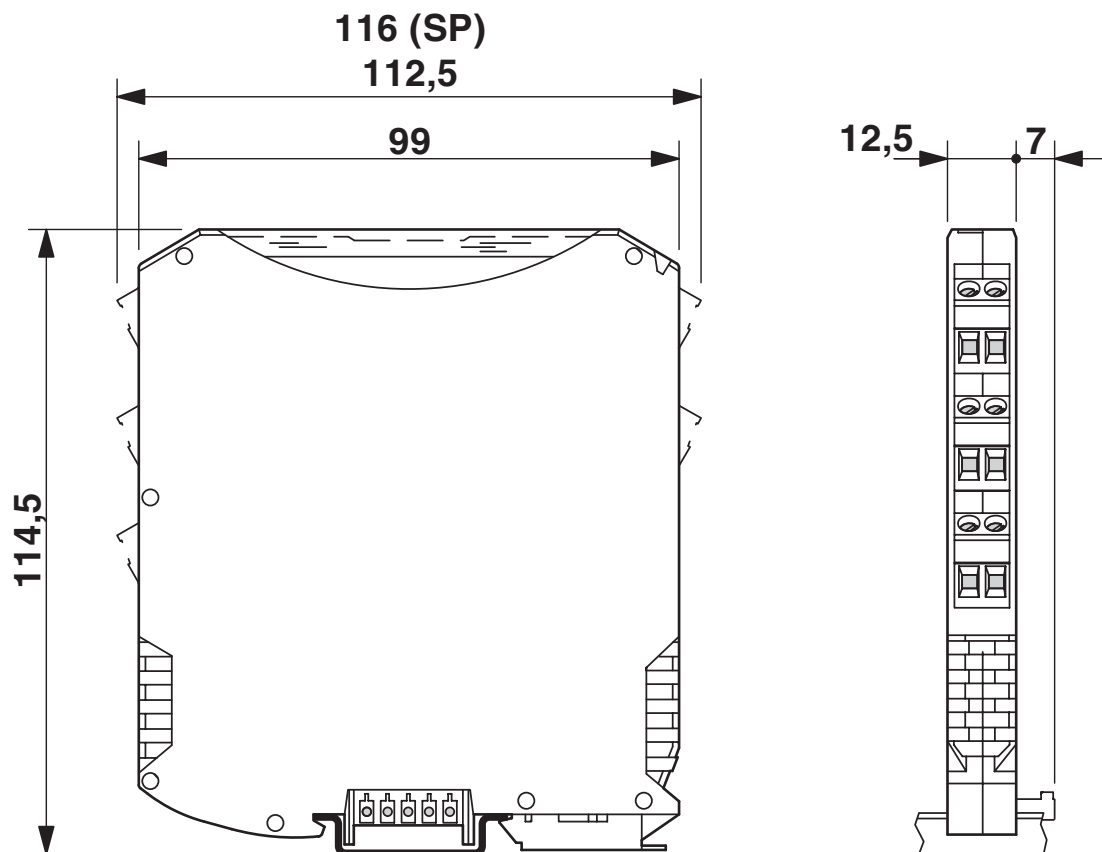
2906165

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



Drawings

Dimensional drawing



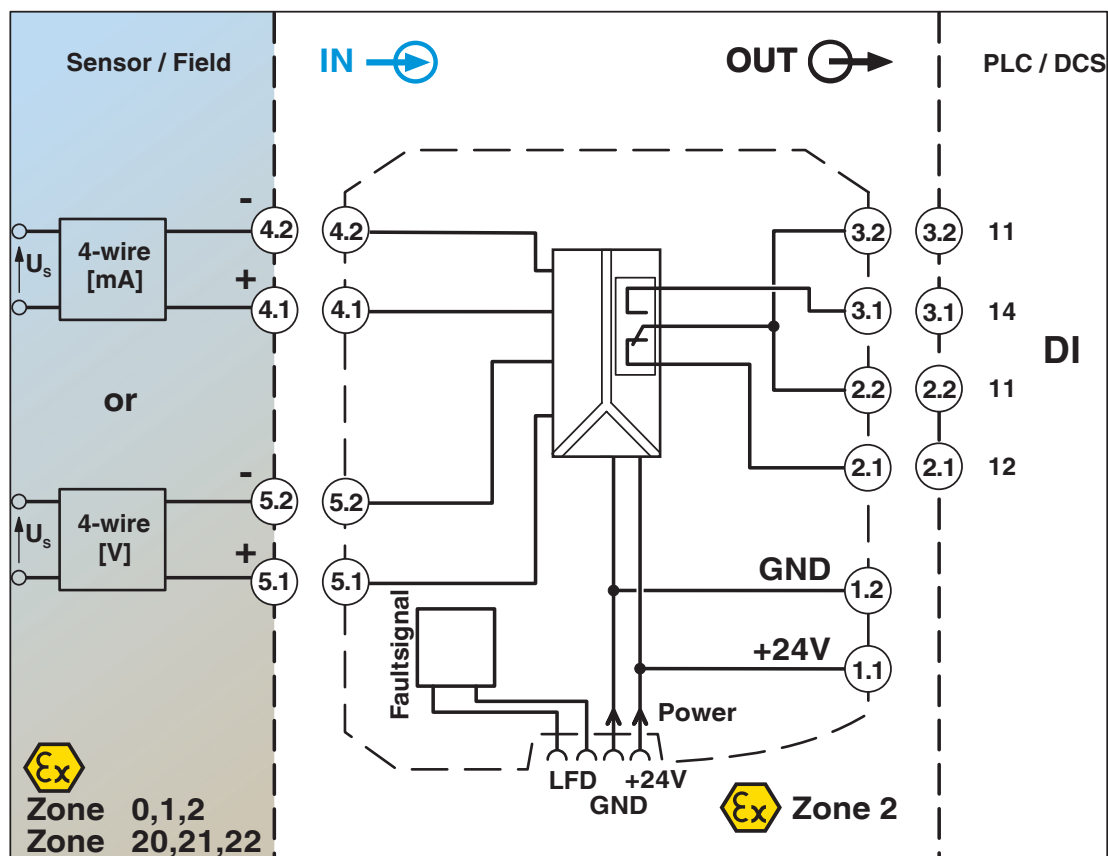
MACX MCR-EX-SL-UI-REL-SP - Limit value switch



2906165

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

Block diagram



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



2906165

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

Approvals

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



DNV GL

Approval ID: TAA000020C



UL Listed

Approval ID: E330267



cUL Listed

Approval ID: FILE E 330267



Functional Safety

Approval ID: 968/FSP 1481.00/17



IECEx

Approval ID: IECEx TUR 18.0014X



cUL Listed

Approval ID: FILE E 199827



UL Listed

Approval ID: E199827



ATEX

Approval ID: TÜV 17 ATEX 8061 X



EAC Ex

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

INMETRO

Approval ID: DNV 21.0089 X



CCC

Approval ID: 2022122316115960

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



2906165

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

cULus Listed

cULus Listed

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



2906165

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

Classifications

ECLASS

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

ETIM

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

UNSPSC

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

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

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



2906165

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

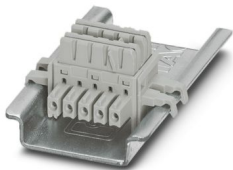
Accessories

ME 6,2 TBUS-2 1,5/5-ST-3,81 GY - DIN rail bus connectors

2695439

<https://www.phoenixcontact.com/pc/products/2695439>

DIN rail connector (TBUS), 5-pos., for bridging the supply voltage, can be snapped onto NS 35/... DIN rail in accordance with EN 60715



MACX MCR-PTB - Power and error message module

2865625

<https://www.phoenixcontact.com/pc/products/2865625>

Power and fault signaling module with screw connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector



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

2906165

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



MACX MCR-PTB-SP - Power and error message module

2924184

<https://www.phoenixcontact.com/pc/products/2924184>



Power and fault signaling module with Push-in connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

QUINT4-SYS-PS/1AC/24DC/2.5/SC - Power supply unit

2904614

<https://www.phoenixcontact.com/pc/products/2904614>



Primary-switched power supply, QUINT POWER, screw connection, DIN rail mounting, supply of devices possible via the TBUS DIN rail connector, protective coating, input: single-phase, output: 24 V DC/2.5 A

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



2906165

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

TC-D37SUB-AIO16-EX-PS-UNI - Module carrier

2902932

<https://www.phoenixcontact.com/pc/products/2902932>



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection), with HART multiplexer connection

TC-D37SUB-ADIO16-EX-P-UNI - Module carrier

2924854

<https://www.phoenixcontact.com/pc/products/2924854>



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection)

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



2906165

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

MPS-IH WH - Insulating sleeve

0201663

<https://www.phoenixcontact.com/pc/products/0201663>

Insulating sleeve, color: white



MPS-IH RD - Insulating sleeve

0201676

<https://www.phoenixcontact.com/pc/products/0201676>

Insulating sleeve, color: red



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



2906165

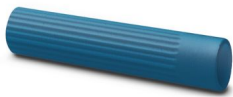
<https://www.phoenixcontact.com/pc/products/2906165>

MPS-IH BU - Insulating sleeve

0201689

<https://www.phoenixcontact.com/pc/products/0201689>

Insulating sleeve, color: blue



MPS-IH YE - Insulating sleeve

0201692

<https://www.phoenixcontact.com/pc/products/0201692>

Insulating sleeve, color: yellow



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



2906165

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

MPS-IH GN - Insulating sleeve

0201702

<https://www.phoenixcontact.com/pc/products/0201702>

Insulating sleeve, color: green



MPS-IH GY - Insulating sleeve

0201728

<https://www.phoenixcontact.com/pc/products/0201728>

Insulating sleeve, color: gray



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

2906165

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



MPS-IH BK - Insulating sleeve

0201731

<https://www.phoenixcontact.com/pc/products/0201731>

Insulating sleeve, color: black



MPS-MT - Test plug

0201744

<https://www.phoenixcontact.com/pc/products/0201744>

Test plug, with solder connection up to 1 mm² conductor cross section, number of positions: 1, color: gray



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



2906165

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

UC-EMLP (11X9) - Plastic label

0819291

<https://www.phoenixcontact.com/pc/products/0819291>

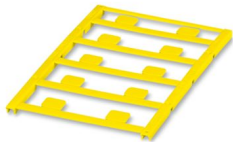


Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

UC-EMLP (11X9) YE - Plastic label

0822602

<https://www.phoenixcontact.com/pc/products/0822602>



Plastic label, Sheet, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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



2906165

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

UC-EMLP (11X9) CUS - Plastic label

0824547

<https://www.phoenixcontact.com/pc/products/0824547>

Plastic label, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

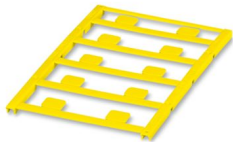


UC-EMLP (11X9) YE CUS - Plastic label

0824548

<https://www.phoenixcontact.com/pc/products/0824548>

Plastic label, can be ordered: by sheet, yellow, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm



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



2906165

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

UC-EMLP (11X9) SR - Plastic label

0828094

<https://www.phoenixcontact.com/pc/products/0828094>



Plastic label, Sheet, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

UC-EMLP (11X9) SR CUS - Plastic label

0828098

<https://www.phoenixcontact.com/pc/products/0828098>



Plastic label, can be ordered: by sheet, silver, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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



2906165

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

US-EMLP (11X9) - Plastic label

0828789

<https://www.phoenixcontact.com/pc/products/0828789>



Plastic label, Card, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

US-EMLP (11X9) YE - Plastic label

0828871

<https://www.phoenixcontact.com/pc/products/0828871>



Plastic label, Card, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

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



2906165

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

US-EMLP (11X9) SR - Plastic label

0828872

<https://www.phoenixcontact.com/pc/products/0828872>

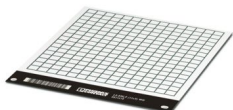


Plastic label, Card, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

LS-EMLP (11X9) WH - Device marker

0831678

<https://www.phoenixcontact.com/pc/products/0831678>



Device marker, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255

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



2906165

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

LS-EMLP (11X9) SR - Device marker

0831705

<https://www.phoenixcontact.com/pc/products/0831705>

Device marker, Sheet, silver, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255

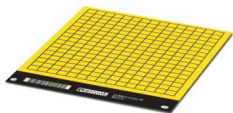


LS-EMLP (11X9) YE - Device marker

0831732

<https://www.phoenixcontact.com/pc/products/0831732>

Device marker, Sheet, yellow, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255



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



2906165

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

SZS 0,6X3,5 - Screwdriver

1205053

<https://www.phoenixcontact.com/pc/products/1205053>



Actuation tool, for ST terminal blocks, insulated, also suitable for use as a bladed screwdriver, size: 0.6 x 3.5 x 100 mm, 2-component grip, with non-slip grip

Phoenix Contact 2024 © - all rights reserved

<https://www.phoenixcontact.com>

PHOENIX CONTACT GmbH & Co. KG

Flachsmarktstraße 8

D-32825 Blomberg

+49 (0) 5235-3 00

info@phoenixcontact.com