

MACX MCR-T-UI-UP-SP-C - Temperature measuring transducer



2811970

<https://www.phoenixcontact.com/pc/products/2811970>

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Freely programmable temperature measuring transducer with analog output and 1 limit value relay, resistance thermometer in 2-, 3-, or 4-conductor technology, thermocouples, wide-range supply. Order configuration, 4-way isolation, Safety Integrity Level (SIL, IEC 61508): 2, Performance Level (ISO 13849-1): d, Systematic Capability: 2, Push-in connection

Your advantages

- Configuration via software (FDT/DTM) or IFS-OP-UNIT operator interface and display unit
- Cold junction compensation with separate plug
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- Up to SIL 2 in accordance with EN 61508
- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources
- Inverse output signal ranges as an option
- Measure differential temperatures
- Relay switching output
- Plug-in screw or spring-cage connection technology (Push-in technology)
- Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Freely programmable input and output

Commercial data

Item number	2811970
Packing unit	1 pc
Minimum order quantity	1 pc
Note	Made to order (non-returnable)
Product key	DK1115
Weight per piece (including packing)	262.5 g
Weight per piece (excluding packing)	150 g
Customs tariff number	85437090
Country of origin	DE

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Technical data

Product properties

Product type	Temperature transmitter
Product family	MACX Analog
Configuration	DIP switches
	Software

Insulation characteristics

Overvoltage category	II
Pollution degree	2

System properties

Functionality

Configuration	DIP switches
	Software

Electrical properties

Electrical isolation	4-way isolation
Electrical isolation between input and output	yes
Maximum power dissipation for nominal condition	1.26 W
Step response (0–99%)	≤ 1.75 s (SIL on)
	1.3 s (SIL off)
Maximum temperature coefficient	0.01 %/K
Maximum transmission error	0.1 % (E.g., at Pt 100, 300 K min. span)

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	375 V _P

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

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

Electrical isolation Input/switching output IEC/EN 60079-11

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

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Supply

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)
Typical current consumption	< 50 mA (24 V DC)
Power consumption	< 1.5 W

Input data

Signal

Number of inputs	1
Input signal	Temperature
	Resistor
	Voltage

Measurement

Sensor types (RTD) that can be used	Pt, Ni, Cu sensors: 2, 3, 4-wire
Sensor types that can be used (TC)	B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG
Temperature measuring range	-250 °C ... 2500 °C (Range depending on the sensor type)
Linear resistance measuring range	0 Ω ... 50 kΩ
Potentiometer resistance range	0 Ω ... 50 kΩ
Linear mV signal range	-1000 mV ... 1000 mV

Output data

Switching: Relay

Configurable/programmable	Yes
Contact switching type	1 changeover contact
Contact material	AgSnO ₂ , hard gold-plated
Maximum switching voltage	30 V AC/DC
Max. switching current	0.5 A (30 V AC)
	1 A (30 V DC)

Signal: Current

Number of outputs	1
Configurable/programmable	Yes
Max. voltage output signal	± 11 V
Current output signal	0 mA ... 20 mA (SIL off)
	4 mA ... 20 mA (SIL on)
Max. current output signal	22 mA
Load/output load voltage output	≥ 10 kΩ
Load/output load current output	≤ 600 Ω (20 mA)
Behavior in the event of a sensor error	freely programmable

Connection data

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Connection method	Push-in connection
Stripping length	10 mm
Conductor cross-section rigid	0.2 mm² ... 2.5 mm²
Conductor cross-section flexible	0.2 mm² ... 2.5 mm²
Conductor cross-section flexible (2 conductors with same cross section)	0.25 mm² ... 0.34 mm² (TWIN ferrule without plastic sleeve)
	0.5 mm² ... 1.5 mm² (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)

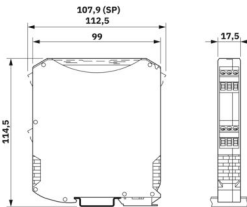
Ex data

Ex installation (EPL)	Gc
	Div. 2

Signaling

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

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
Ambient temperature (operation)	-20 °C ... 65 °C

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Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	typ. 5 % ... 95 % (non-condensing)
Shock (operation)	15g (IEC 60068-2-27)
Vibration (operation)	5g (IEC 60068-2-6)

Altitude range (≤ 2000 m)

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)	-20 °C ... 65 °C
Safety-related maximum voltage U_m	30 V (Installation in zone 2)

Altitude range (≤ 3000 m)

Height range	> 2000 m ... 3000 m
Ambient temperature (operation)	-20 °C ... 55 °C
Safety-related maximum voltage U_m	30 V (Installation in zone 2)

Altitude range (≤ 4000 m)

Height range	> 3000 m ... 4000 m
Ambient temperature (operation)	-20 °C ... 50 °C
Safety-related maximum voltage U_m	30 V (Installation in zone 2)

Altitude range (≤ 5000 m)

Height range	> 4000 m ... 5000 m
Ambient temperature (operation)	-20 °C ... 45 °C
Safety-related maximum voltage U_m	30 V (Installation in zone 2)

Approvals

CE

Certificate	CE-compliant
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ATEX

Identification	Ex II 3 G Ex ec ic nC IIC T4 Gc
Certificate	IBExU 10 ATEX 1044 X

IECEX

Identification	Ex ec ic nC IIC T4 Gc
Certificate	IECEX IBE 10.0004 X

INMETRO

Identification	Ex ec ic nC IIC T4 Gc
Certificate	DNV 18.0143 X

UL, USA/Canada

Identification	UL 508 Listed
	Class I, Div. 2, Groups A, B, C, D T6

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	Class I, Zone 2, Group IIC T6
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Shipbuilding approval

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

Identification	2
Certificate	SEBS-A.150520/17, V2.0

Systematic Capability

Identification	2
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Performance Level (ISO 13849-1)

Identification	d
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EAC Ex

Identification	Ex ec ic IIC T4 Gc
Certificate	BY/112 02.01 TP012 103.01 00078

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	4-way isolation
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Mounting

Mounting type	DIN rail mounting
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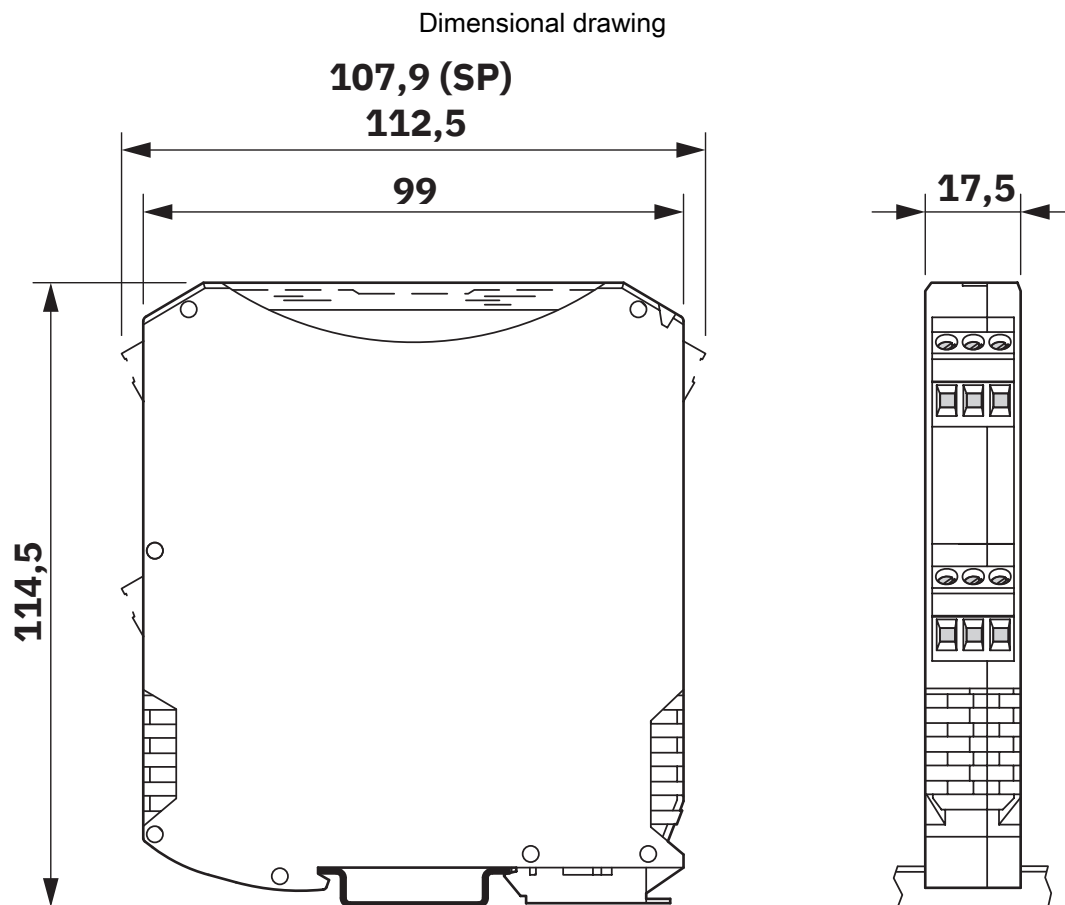
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Drawings

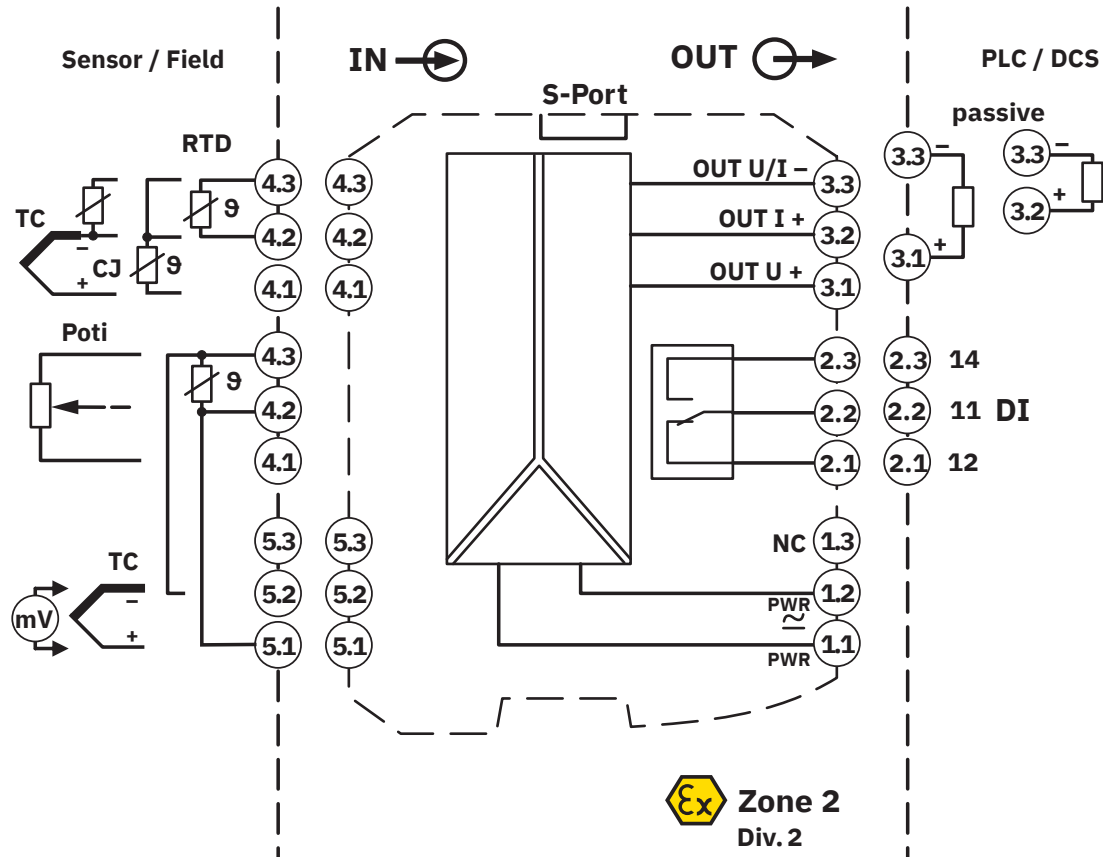


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Block diagram



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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/pc/products/2811970>

DNV

Approval ID: TAA000020C



UL Listed

Approval ID: E238705



cUL Listed

Approval ID: E238705



EAC Ex

Approval ID: TP012 103.01 00078



IECEx

Approval ID: IECEx IBE 10.0004X



cUL Listed

Approval ID: E199827



UL Listed

Approval ID: E199827



ATEX

Approval ID: IBExU 10 ATEX 1044

INMETRO

Approval ID: DNV 18.0143 X

INMETRO

Approval ID: DNV 18.0143 X

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Classifications

ECLASS

ECLASS-13.0	27210129
ECLASS-15.0	27210129

ETIM

ETIM 9.0	EC002919
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UNSPSC

UNSPSC 21.0	41112100
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Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	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: n/a)
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Accessories

MCR-DP - Separating plate

1430594

<https://www.phoenixcontact.com/pc/products/1430594>



The partition plate is used to maintain Ex i isolating distances when Ex i and non-Ex i devices are mounted side by side on a DIN rail.

IFS-USB-PROG-ADAPTER - Programming adapter

2811271

<https://www.phoenixcontact.com/pc/products/2811271>



Programming adapter with USB interface, for programming with software. The USB driver is included in the software solutions for the products to be programmed, such as measuring transducers or motor managers.

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MACX MCR-I20 - Plug

2905680

<https://www.phoenixcontact.com/pc/products/2905680>



Connection terminal block for current signals, +20 mA ... -20 mA, for safe switching of limit values, in combination with MACX ...-T-UI... temperature transducers

MACX MCR-CJC - Plug

2924993

<https://www.phoenixcontact.com/pc/products/2924993>



Plug for cold junction compensation for thermocouples, for safe switching of limit values, in combination with MACX ...-T-UI... temperature transducers.

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IFS-BT-PROG-ADAPTER - Adapter

2905872

<https://www.phoenixcontact.com/pc/products/2905872>



Bluetooth adapter with micro USB and S-PORT interface for wireless communication with the MINI Analog, MINI Analog Pro, MACX Analog, Interface System Gateways, and PLC logic device series.

MPS-IH WH - Insulating sleeve

0201663

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

Insulating sleeve, color: white



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MPS-IH RD - Insulating sleeve

0201676

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Insulating sleeve, color: red

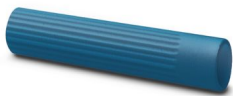


MPS-IH BU - Insulating sleeve

0201689

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

Insulating sleeve, color: blue



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MPS-IH YE - Insulating sleeve

0201692

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Insulating sleeve, color: yellow



MPS-IH GN - Insulating sleeve

0201702

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Insulating sleeve, color: green



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MPS-IH GY - Insulating sleeve

0201728

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

Insulating sleeve, color: gray



MPS-IH BK - Insulating sleeve

0201731

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

Insulating sleeve, color: black



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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

UC-EMLP (11X9) - Plastic label

0819291

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



Plastic label, Sheet, white, unmarked, can be labeled with: BLUEMARK E. CARD, BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, Number of individual labels: 10, text field height: 9 mm, text field width: 11 mm

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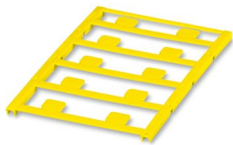
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UC-EMLP (11X9) YE - Plastic label

0822602

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Plastic label, Sheet, yellow, unmarked, can be labeled with: BLUEMARK E. CARD, BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, Number of individual labels: 10, text field height: 9 mm, text field width: 11 mm

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, text field height: 9 mm, text field width: 11 mm

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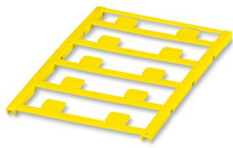
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UC-EMLP (11X9) YE CUS - Plastic label

0824548

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



Plastic label, can be ordered: by sheet, yellow, labeled according to customer specifications, mounting type: adhesive, text field height: 9 mm, text field width: 11 mm

UC-EMLP (11X9) SR - Plastic label

0828094

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



Plastic label, Sheet, silver, unmarked, can be labeled with: BLUEMARK E. CARD, BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, Number of individual labels: 10, text field height: 9 mm, text field width: 11 mm

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

0828098

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

US-EMLP (11X9) - Plastic label

0828789

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



Plastic label, Card, white, unmarked, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, THERMOMARK PRIME 2.0, mounting type: adhesive, Number of individual labels: 135, text field height: 9 mm, text field width: 11 mm

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US-EMLP (11X9) YE - Plastic label

0828871

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



Plastic label, Card, yellow, unmarked, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, THERMOMARK PRIME 2.0, mounting type: adhesive, Number of individual labels: 135, text field height: 9 mm, text field width: 11 mm

US-EMLP (11X9) SR - Plastic label

0828872

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Plastic label, Card, silver, unmarked, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, THERMOMARK PRIME 2.0, mounting type: adhesive, Number of individual labels: 135, text field height: 9 mm, text field width: 11 mm

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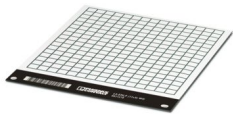
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LS-EMLP (11X9) WH - Device marker

0831678

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

Device marker, Sheet, white, unmarked, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, Number of individual labels: 255, text field height: 9 mm, text field width: 11 mm



LS-EMLP (11X9) SR - Device marker

0831705

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

Device marker, Sheet, silver, unmarked, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, Number of individual labels: 255, text field height: 9 mm, text field width: 11 mm



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LS-EMLP (11X9) YE - Device marker

0831732

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

Device marker, Sheet, yellow, unmarked, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, Number of individual labels: 255, text field height: 9 mm, text field width: 11 mm



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

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

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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

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