

# MACX MCR-EX-AP-2F-2I - Frequency measuring transducer



1290530

<https://www.phoenixcontact.com/in/products/1290530>

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Ex i-Frequency transducer, the frequencies measured at the Ex i inputs (0.001 Hz ... 20 kHz) are output as 0 mA / 4 mA ... 20 mA non Ex i signals. number of channels: 2, Standard configuration, 5-way isolation, Screw connection

## Commercial data

Item number	1290530
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	*****
Product key	DK121W
GTIN	4063151522063
Weight per piece (including packing)	215.5 g
Weight per piece (excluding packing)	160 g
Customs tariff number	85437090
Country of origin	DE

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## Technical data

### Notes

Note on application	Accuracy, typically specified as a percentage of the basic measuring range at $U_N$ , 23°C
Notes on operation	Installation conditions influence the ambient temperature. Please refer to the "Control cabinet installation instructions".
Notes on operation	Use suitable cables and cable glands for applications below - 20°C.

### Product properties

Product type	Frequency value transformer
Product family	MACX Analog
No. of channels	2
Configuration	Software

### System properties

#### Functionality

Configuration	Software
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### Electrical properties

Electrical isolation	5-way isolation
Temperature coefficient, typical	$\leq 0.05 \%$
Reverse polarity protection	yes

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

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V <sub>PP</sub>

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

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V <sub>PP</sub>

#### Electrical isolation Input/error message output IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V <sub>PP</sub>

#### Electrical isolation Input/configuration interface IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V <sub>PP</sub>

#### Electrical isolation Output 1/output 2

Test voltage	350 V (50 Hz, 60 s)
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#### Electrical isolation Output/supply

Test voltage	350 V (50 Hz, 60 s)
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## Electrical isolation Output/configuration interface

Test voltage	350 V (50 Hz, 60 s)
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## Electrical isolation Output/supply/error message output

Test voltage	350 V (50 Hz, 60 s)
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## Supply

Nominal supply voltage	24 V DC
Supply voltage range	18 V ... 31.2 V
Power dissipation	≤ 1.5 W
Power consumption	1.8 W

## Input data

### Measurement: Frequency

Description of the input	Intrinsically safe
Available input sources	in accordance with IEC/EN 60947-5-6 NAMUR
Pulse time	25 µs
Frequency measuring range	0.001 Hz ... 20000 Hz
Line fault detection	< 0.05 mA ... 0.35 mA (Line break)
	< 100 Ω ... 360 Ω (Short circuit)

## Output data

### Signal: Error message output

Maximum switching voltage	30 V
Max. switching current	100 mA

### Signal: Current

Current output signal	0 mA ... 20 mA (configurable)
	4 mA ... 20 mA (configurable)
	0 mA ... 20.5 mA (Function area)
Output current with short-circuit	3.8 mA (Default setting, adjustable)
Output current with wire break	20.5 mA (Default setting, adjustable)
Load	0 Ω ... 600 Ω
Line fault detection	< 0.05 mA ... 0.35 mA (Line break)
	< 100 Ω ... 360 Ω (Short circuit)

## Connection data

Connection method	Screw connection
Stripping length	7 mm
Screw thread	M3
Conductor cross section rigid	0.2 mm² ... 2.5 mm²
Conductor cross section flexible	0.2 mm² ... 2.5 mm²
Conductor cross section AWG	24 ... 14

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## Ex data

Ex installation (EPL)	Gc
Ex i circuits (EPL)	Ga
	Da
	Ma

## Safety data

Max. internal inductance $L_i$	negligible
Max. internal capacitance $C_i$	negligible
Max. output voltage $U_o$	10.5 V
Max. output current $I_o$	23.4 mA
Max. output power $P_o$	61.4 mW
Safety-related maximum voltage $U_m$	253 V AC
I/A (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	450 mH / 75 $\mu$ F
IIB/IIIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	230 mH / 16.8 $\mu$ F
IIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	63 mH / 2.41 $\mu$ F
I (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	600 mH / 95 $\mu$ F
I/A (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 2.9 $\mu$ F, 10 mH / 4.5 $\mu$ F, 1 mH / 7.3 $\mu$ F, 0.1 mH / 14 $\mu$ F
IIB/IIIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 1.9 $\mu$ F, 20 mH / 2.7 $\mu$ F, 2 mH / 4.5 $\mu$ F, 0.5 mH / 6.4 $\mu$ F
IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	20 mH / 0.49 $\mu$ F, 5 mH / 0.67 $\mu$ F, 1 mH / 0.96 $\mu$ F, 0.2 mH / 1.4 $\mu$ F
I (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 4 $\mu$ F, 10 mH / 5.7 $\mu$ F, 2 mH / 7.8 $\mu$ F, 0.1 mH / 17 $\mu$ F

## Signaling

Status display	Green LED (supply voltage)
	Red LED (line errors)

## Dimensions

Dimensional drawing	
Width	17.5 mm
Height	112.5 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)

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## Material specifications

Flammability rating according to UL 94	V0
Housing material	PA 6.6

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20 (Terminal blocks) IP30 (Housing)
Ambient temperature (operation)	-40 °C ... 70 °C (Stand-alone device: any mounting position) -40 °C ... 50 °C (Group assembly: vertical DIN rail without circulating air) -40 °C ... 65 °C (Group assembly: vertical DIN rail with circulating air) -40 °C ... 65 °C (Group assembly: horizontal DIN rail without circulating air) -40 °C ... 70 °C (Group assembly: horizontal DIN rail with circulating air)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Altitude	≤ 2000 m
Permissible humidity (operation)	≤ 95 % (non-condensing)

## Approvals

### ATEX

Identification	⚡ II (1) G [Ex ia Ga] IIC ⚡ II (1) D [Ex ia Da] IIIC ⚡ II 3 (1) G Ex nA [ia Ga] IIC T4 Gc ⚡ I (M1) [Ex ia Ma] I
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### IECEx

Identification	[Ex ia Ga] IIC [Ex ia Da] IIIC Ex nA nC [ia Ga] IIC T4 Gc [Ex ia Ma] I
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## EMC data

Electromagnetic compatibility	Tested in accordance with the following standards and regulations: EN 61326-1 For industrial use, NAMUR NE 21
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## Standards and regulations

Electrical isolation	5-way isolation
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## Mounting

Mounting type	NS 35/15, NS 35/7,5
Mounting position	vertical, horizontal

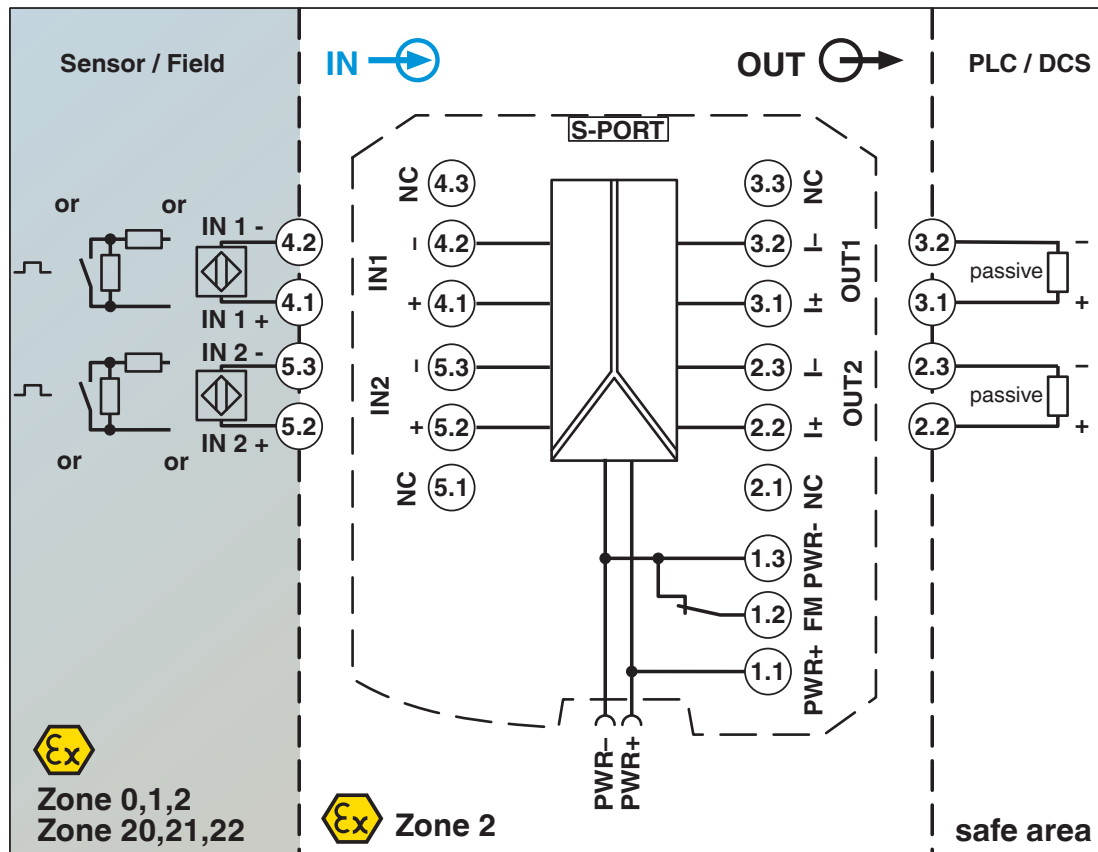
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## Drawings

Block diagram

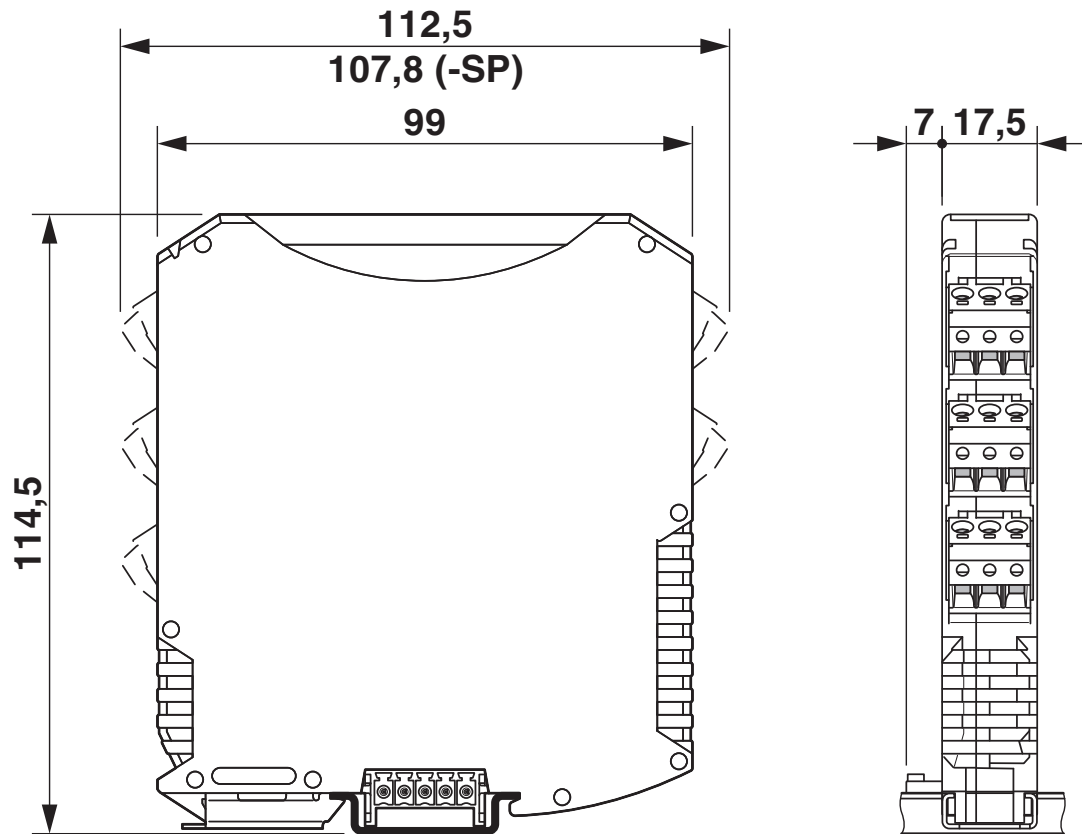


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Dimensional drawing



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## Approvals

📄 To download certificates, visit the product detail page: <https://www.phoenixcontact.com/in/products/1290530>



**IECEx**

Approval ID: IECEx BVS 21.0018X



**ATEX**

Approval ID: BVS 21 ATEX E 016X



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## Classifications

### ECLASS

ECLASS-11.0	27210128
ECLASS-12.0	27210128
ECLASS-13.0	27210128

### ETIM

ETIM 9.0	EC002918
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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	24247c88-130a-4008-8342-335d1c1327d7

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## Accessories

### IFS-USB-PROG-ADAPTER - Programming adapter

2811271

<https://www.phoenixcontact.com/in/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-PTB - Power and error message module

2865625

<https://www.phoenixcontact.com/in/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

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

2924184

<https://www.phoenixcontact.com/in/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

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

2904614

<https://www.phoenixcontact.com/in/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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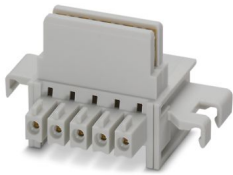
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## ME 17,5 TBUS 1,5/ 5-ST-3,81 GY - DIN rail bus connectors

1090049

<https://www.phoenixcontact.com/in/products/1090049>



DIN rail connector, color: gray, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, product range: TBUS5-17,5..., pitch: 3.81 mm, mounting: DIN rail mounting, locking: without, mounting method: without, type of packaging: packed in cardboard, Item with gold-plated contacts, bus connectors for connecting with electronics housings, 5 parallel contacts

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## ME-TBUS-A MC 1,5-2 - DIN rail bus connectors

1351974

<https://www.phoenixcontact.com/in/products/1351974>



DIN rail connector adapter (2-pos.) for connection of MACX MCR-EX-AP ... devices on the right side to the MACX MCR-PTB(-SP) power module with DIN rail connector ME 17,5 TBUS 1,5/5-ST-3,81 GY for bridging the supply voltage.

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## ME-TBUS-A IMC1,5-2 - DIN rail bus connectors

1351982

<https://www.phoenixcontact.com/in/products/1351982>



DIN rail connector adapter (2-pos.) for connection of MACX MCR-EX-AP... devices on the left side to the MACX MCR-PTB(-SP) power module with DIN rail connector ME 17,5 TBUS 1,5/5-ST-3,81 GY for bridging the supply voltage.

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## MCR-DP - Separating plate

1430594

<https://www.phoenixcontact.com/in/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.

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## MPS-IH WH - Insulating sleeve

0201663

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Insulating sleeve, color: white



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## MPS-IH RD - Insulating sleeve

0201676

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

Insulating sleeve, color: red



# MACX MCR-EX-AP-2F-2I - Frequency measuring transducer



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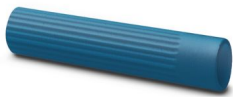
<https://www.phoenixcontact.com/in/products/1290530>

## MPS-IH BU - Insulating sleeve

0201689

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

Insulating sleeve, color: blue



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## MPS-IH YE - Insulating sleeve

0201692

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Insulating sleeve, color: yellow





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## MPS-IH GN - Insulating sleeve

0201702

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

Insulating sleeve, color: green



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## MPS-IH GY - Insulating sleeve

0201728

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

Insulating sleeve, color: gray



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## MPS-IH BK - Insulating sleeve

0201731

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

Insulating sleeve, color: black



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## MPS-MT - Test plug

0201744

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

Test plug, with solder connection up to 1 mm<sup>2</sup> conductor cross section, number of positions: 1, color: gray



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## UC-EMLP (11X9) - Plastic label

0819291

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



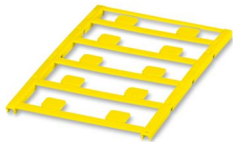
Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, Number of individual labels: 10, text field height: 9 mm, text field width: 11 mm

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

0822602

<https://www.phoenixcontact.com/in/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, Number of individual labels: 10, text field height: 9 mm, text field width: 11 mm

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

0824547

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



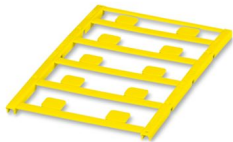
Plastic label, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: adhesive, text field height: 9 mm, text field width: 11 mm

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

0824548

<https://www.phoenixcontact.com/in/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

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

0828094

<https://www.phoenixcontact.com/in/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, 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

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



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

# MACX MCR-EX-AP-2F-2I - Frequency measuring transducer



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## US-EMLP (11X9) - Plastic label

0828789

<https://www.phoenixcontact.com/in/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, 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/in/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, Number of individual labels: 135, text field height: 9 mm, text field width: 11 mm

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## US-EMLP (11X9) SR - Plastic label

0828872

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



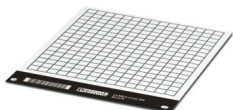
Plastic label, Card, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, Number of individual labels: 135, text field height: 9 mm, text field width: 11 mm

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## LS-EMLP (11X9) WH - Device marker

0831678

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



Device marker, Sheet, white, unlabeled, 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) SR - Device marker

0831705

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Device marker, Sheet, silver, unlabeled, 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



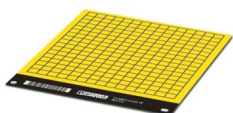
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## LS-EMLP (11X9) YE - Device marker

0831732

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

Device marker, Sheet, yellow, unlabeled, 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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## SZS 0,6X3,5 - Screwdriver

1205053

<https://www.phoenixcontact.com/in/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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