

MACX MCR-EX-SL-SD-23-48-LFD-SP - Solenoid driver



2924870

<https://www.phoenixcontact.com/in/products/2924870>

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Ex i solenoid driver for controlling Ex i solenoid valves in hazardous areas, logic input, off-load voltage 22.6 V, current limitation at 48 mA, line fault transparency, error message output, up to SIL 3 in accordance with IEC 61508, Push-in connection

Your advantages

- Input: logic
- Output: intrinsically safe [Ex ia]; off-load voltage > 22.6 V DC; current limitation > 48 mA
- Line fault detection (can be enabled/disabled), via the signal circuit or via a separate error message output
- Transparent for test pulses
- Up to SIL 3 according to IEC/EN 61508
- Safe electrical isolation between output, input, supply, and error message output
- Power supply and error indication possible via DIN rail connector
- Plug-in connection terminals, push-in connection technology
- Installation in zone 2 permitted
- Housing width: 12.5 mm

Commercial data

Item number	2924870
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CK3
Product key	DK1214
Catalog page	Page 163 (C-5-2019)
GTIN	4046356635004
Weight per piece (including packing)	181 g
Weight per piece (excluding packing)	152.5 g
Customs tariff number	85437090
Country of origin	DE

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Technical data

Product properties

Product type	Solenoid driver
Product family	MACX Analog
Type	Ex i signal conditioners with SIL functional safety
Configuration	DIP switches

Electrical properties

Electrical isolation

Overvoltage category	II
Pollution degree	2

Electrical isolation Output/input, error message output IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V _{PP}
Test voltage	2.5 kV AC (50 Hz, 60 s)

Electrical isolation Output/input, error message output 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 Output/supply, DIN rail connector IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V _{PP}
Test voltage	2.5 kV AC (50 Hz, 60 s)

Electrical isolation Output/supply, DIN rail connector 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/error message output/supply

Test voltage	1.5 kV AC (50 Hz, 60 s)
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Supply

Nominal supply voltage	24 V DC -20 % ... +25 %
Supply voltage range	19.2 V DC ... 30 V DC
Power dissipation	< 2.2 W

Input data

Signal: Logic

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Number of inputs	1
Switching level "0" signal	0 V DC ... 5 V DC (or open)
Switching level "1" signal	15 V DC ... 30 V DC
Input current	< 12 mA
Input impedance	3 M Ω (high-resistance in the event of a line fault at the output)
Immune to test pulses	Yes

Output data

Signal: Error message output

Contact switching type	N/O contact
Type of output signal	Transistor output, passive
Maximum switching voltage	30 V DC
Max. switching current	50 mA
Short-circuit-proof	yes

Signal: Voltage

Output description	intrinsically safe
Number of outputs	1
Output voltage	≥ 9.36 V DC (48 mA)
Current limitation	> 48 mA (with line fault detection)
Response time	< 30 ms
Non-load voltage	> 22.5 V DC
Short-circuit-proof	yes
Line fault detection	> 10 k Ω (Line break)
	< 50 Ω (Short circuit)
	Activated /deactivated via DIP switch

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

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Div. 1

Safety data

Max. internal inductance L_i	negligible
Max. internal capacitance C_i	11 nF
Max. output voltage U_o	25.3 V
Max. output current I_o	94 mA
Max. output power P_o	595 mW
Maximum internal resistance R_i	269 Ω
Safety-related maximum voltage U_m	253 V AC
	125 V DC
IIA/I (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	32.2 mH / 2.85 μ F
IIB/IIIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	16.1 mH / 0.81 μ F
IIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	4 mH / 0.095 μ F
IIA (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o	20 mH / 0.55 μ F, 10 mH / 0.57 μ F, 1 mH / 0.61 μ F, 0.5 mH / 0.7 μ F, 0.2 mH / 0.89 μ F
IIB/IIIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o	5 mH / 289 nF, 0.5 mH / 489 nF
IIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o	1 mH / 39 nF, 0.5 mH / 59 nF, 0.15 mH / 89 nF

Signaling

Status display	Green LED (supply voltage)
	LED yellow (switching state)
	Red LED (line errors)

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

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Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20 (not assessed by UL)
Ambient temperature (operation)	-20 °C ... 60 °C (Any mounting position) -20 °C ... 70 °C (Derating)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Permissible humidity (operation)	10 % ... 95 % (non-condensing)

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 ... 70 °C
Safety-related maximum voltage U_m	253 V AC 125 V DC
Rated insulation voltage	375 V _{PP} 300 V AC/DC

Altitude range (≤ 3000 m)

Height range	> 2000 m ... 3000 m
Ambient temperature (operation)	-20 °C ... 63 °C
Safety-related maximum voltage U_m	190 V AC 110 V DC
Rated insulation voltage	190 V

Altitude range (≤ 4000 m)

Height range	> 3000 m ... 4000 m
Ambient temperature (operation)	-20 °C ... 56 °C
Safety-related maximum voltage U_m	60 V AC/DC
Rated insulation voltage	60 V AC/DC

Altitude range (≤ 5000 m)

Height range	> 4000 m ... 5000 m
Ambient temperature (operation)	-20 °C ... 49 °C
Safety-related maximum voltage U_m	60 V AC/DC
Rated insulation voltage	60 V AC/DC

Approvals

CE

Certificate	CE-compliant
Note	and EN 61326

ATEX

Identification	Ⓢ I (M1) [Ex ia Ma] I Ⓢ II (1) G [Ex ia Ga] IIC
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Certificate	II (1) D [Ex ia Da] IIIC
	II 3(1) G Ex ec [ia Ga] IIC T4 Gc X
	IBExU 13 ATEX1045X

IECEX

Identification	[Ex ia Ma] I
	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec [ia Ga] IIC T4 Gc
Certificate	IECEX IBE 13.0014X

CCC / China-Ex

Identification	[Ex ia Ga] IIB
	[Ex ia Da] IIIC
	Ex ec [ia IIB Ga] IIC T4 Gc
Certificate	2022122316115979

UL, USA/Canada

Identification	UL 61010 Listed
Certificate	UL C.D.-No 83104549

Shipbuilding approval

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

Identification	3
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INMETRO

Identification	[Ex ia Ma] I
	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec [ia Ga] IIC T4 Gc
Certificate	DNV 18.0145 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	EN 61000-6-4

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Standards and regulations

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

Mounting

Mounting type	DIN rail mounting
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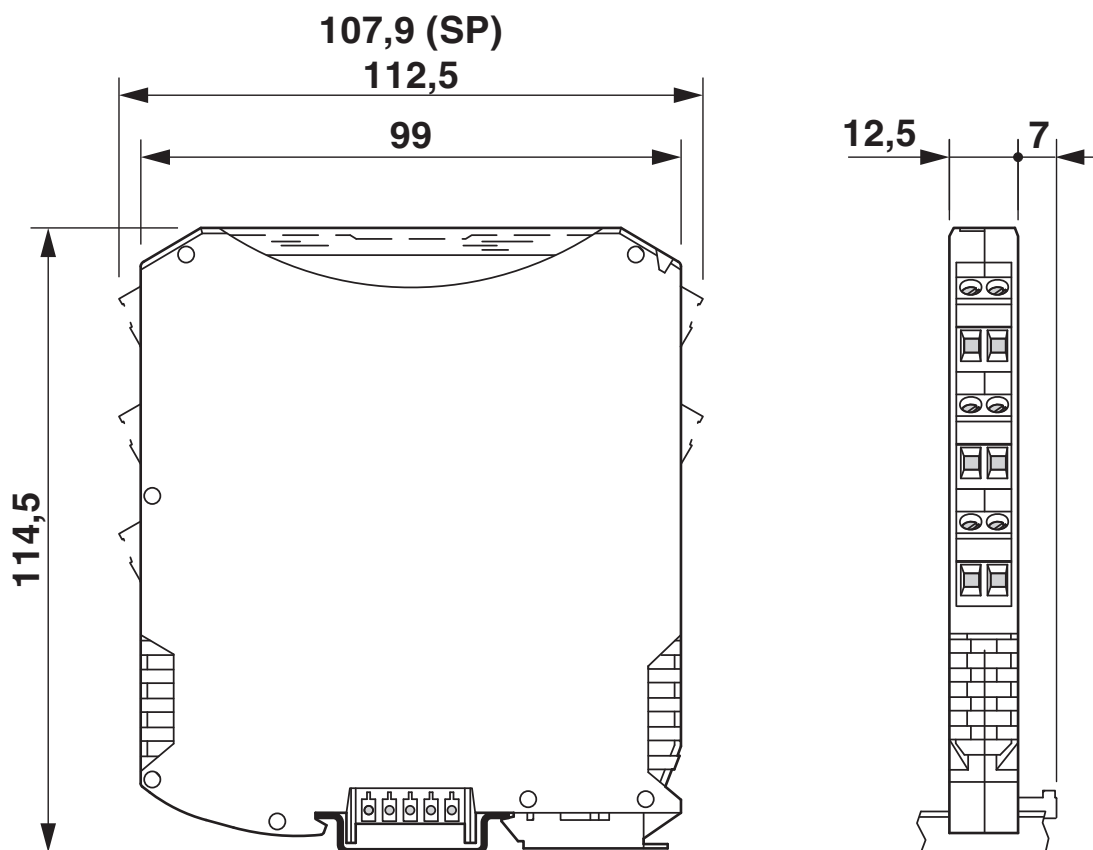


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Drawings

Dimensional drawing



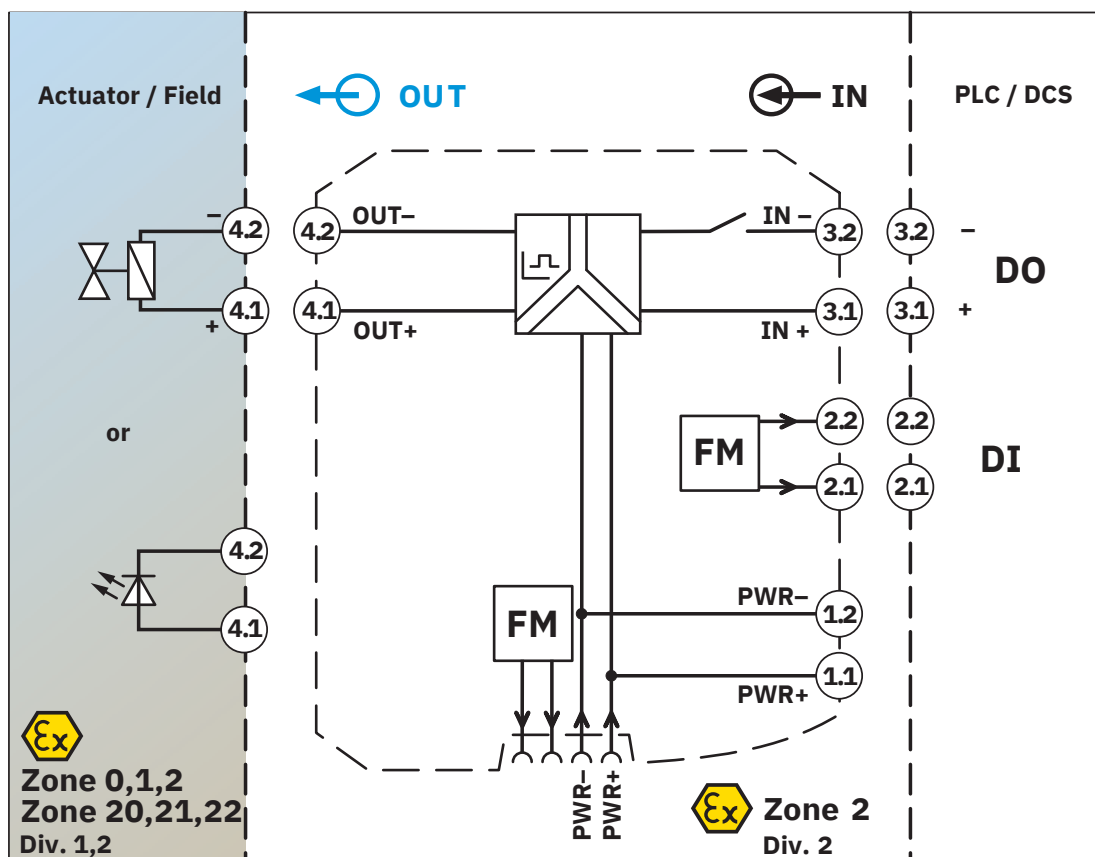
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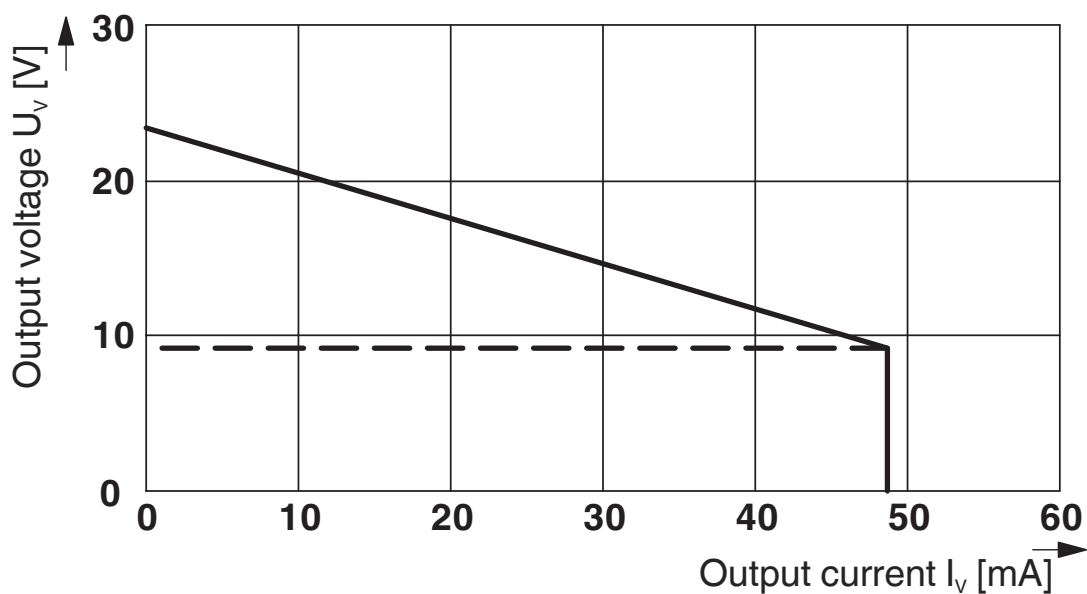
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Block diagram



Diagram



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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/in/products/2924870>



UL Listed

Approval ID: E330267



CCC

Approval ID: 2020322 316001582

Functional Safety

Approval ID: BVS Pb 11/13

DNV

Approval ID: TAA000020C



IECEx

Approval ID: IECEx IBE 13.0014X



cUL Listed

Approval ID: E199827



UL Listed

Approval ID: E199827



ATEX

Approval ID: IBExU 13 ATEX 1045



IECEx

Approval ID: IECEx IBE 13.0014X



ATEX

Approval ID: IBExU13ATEX1045 X

cULus Listed

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Classifications

ECLASS

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

ETIM

ETIM 8.0	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	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	8d4f23c9-3a18-4b23-94d9-b10862a47979

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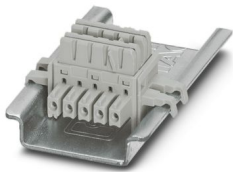
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Accessories

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

2695439

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

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

2924854

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

MPS-IH WH - Insulating sleeve

0201663

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Insulating sleeve, color: white



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MPS-IH RD - Insulating sleeve

0201676

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Insulating sleeve, color: red

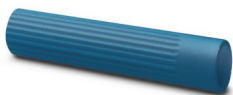


MPS-IH BU - Insulating sleeve

0201689

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Insulating sleeve, color: blue



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MPS-IH YE - Insulating sleeve

0201692

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

Insulating sleeve, color: yellow



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



MPS-IH BK - Insulating sleeve

0201731

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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 mm² conductor cross section, number of positions: 1, color: gray

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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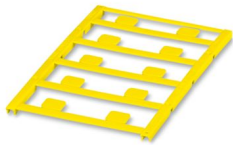
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UC-EMLP (11X9) YE - Plastic label

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

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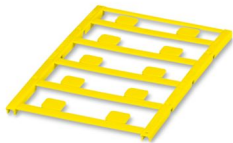
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UC-EMLP (11X9) YE CUS - Plastic label

0824548

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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/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

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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/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

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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

US-EMLP (11X9) SR - Plastic label

0828872

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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

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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

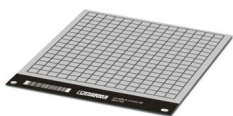


LS-EMLP (11X9) SR - Device marker

0831705

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

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



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

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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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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