

# MACX MCR-EX-SL-SD-21-40-LP - Solenoid driver



2865764

<https://www.phoenixcontact.com/us/products/2865764>

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Ex i solenoid driver. For the intrinsically safe control of Ex i solenoid valves, alarm modules or LEDs installed in the Ex area. Current limitation at 40 mA. For gases up to Group IIC, loop-powered, electrical isolation, SIL 3. Screw connection.

## Your advantages

- Mechanically compatible with the DIN rail connector
- Various output characteristic curves compatible with standard solenoid valves
- Loop-powered: the required power is supplied via the control signal on the input side.
- Up to SIL 3 in accordance with IEC 61508
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- Output: [Ex ia] IIC/[Ex ia] IIB
- 2-way electrical isolation
- Input: 19.2 V DC ... 30 V DC

## Commercial Data

Item number	2865764
Packing unit	1 pc
Minimum order quantity	1 pc
Sales Key	C430
Product Key	CK3142
Catalog Page	Page 167 (C-5-2019)
GTIN	4046356325233
Weight per Piece (including packing)	171.3 g
Weight per Piece (excluding packing)	119 g
Customs tariff number	85437090
Country of origin	DE

## Technical Data

### Notes

#### Utilization restriction

EMC note	EMC: class A product, see manufacturer's declaration in the download area
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### Product properties

Product type	Solenoid driver
Product family	MACX Analog
No. of channels	1
Type	Ex i signal conditioners with SIL functional safety
Compatible valve	ASCO Coil 195 Bürkert Coil AC 10 standard Bürkert Coil AC 10 high resistance Bürkert Coil AC 21 standard 700 mW / 65°C Bürkert Coil AC 21 high resistance 700 mW / 65°C Bürkert Coil AC 21 standard 900 mW / 45°C Bürkert Coil AC 21 high resistance 900 mW / 45°C Bürkert Coil AC 21 standard 900 mW / 60°C Bürkert Coil AC 21 high resistance 900 mW / 60°C Bürkert Coil G1 642735 standard 600 mW / 50°C Bürkert Coil G1 642735 high resistance 600 mW / 50°C Bürkert Coil G1 642735 standard 800 mW / 40°C Bürkert Coil G1 642735 high resistance 800 mW / 40°C Bürkert Coil G1 642735 standard 1000 mW / 40°C Bürkert Coil G1 642735 high resistance 1000 mW / 40°C Norgren Herion Coil 2050 Norgren Herion Coil 2051 Norgren Herion Coil 2052 Norgren Herion Coil 2080 / 2082 Norgren Herion Coil 2081 / 2083 Norgren Herion Coil 2084 Hörbiger Piezo P8 38x RF-Nx-SPN65 30 V type Hörbiger Piezo P20 381RF-NG-CPN61 30 V type Parker Coil VZ07 488650.01 Parker Coil VZ33 494035.10 Parker Coil VZ08 488660.01 Parker Coil VZ09 488670.01 Parker Coil VZ95 482160.01 EEx ia IIB T6 Parker Coil VZ23 482870.01 Samson Coil 3701-12 (12 V) Samson Coil 3701-13 (24 V)

# MACX MCR-EX-SL-SD-21-40-LP - Solenoid driver



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	Samson Coil 3963-12 (12 V)
	Samson Coil 3963-13 (24 V)
	Samson Coil 3964-12 (12 V)
	Samson Coil 3964-13 (24 V)
	Seitz Pilot valve PV 12F73 Ci oH
	Seitz Pilot valve PV 12F73 Xi oH
	Seitz Pilot valve PV 12F73 Xi oH-2
Note	This is an extract of possible combinations of valves and solenoid drivers.

Insulation characteristics: GB Standard

Overvoltage category	II
Pollution degree	2

## Electrical properties

No. of channels	1
Electrical isolation	2-way isolation
Maximum temperature coefficient	0.01 %/K

Electrical isolation Output/input

Electrical isolation	375 V (Peak value in accordance with IEC/EN 60079-11)
Rated insulation voltage	300 V <sub>rms</sub>
Test voltage	2.5 kV AC (50 Hz, 60 s)
Insulation	Safe isolation in accordance with IEC/EN 61010-1

Supply

Supply voltage range	loop-powered, no external supply necessary
Power dissipation	< 1.055 W

## Input data

Signal: Voltage

Number of inputs	1
Voltage input signal	19.2 V DC ... 30 V DC (24 V DC, -20 % ... +25 %)
Max. current input signal	65 mA (U <sub>e</sub> = 24 V DC)

## Output data

Signal: Voltage

Output description	intrinsically safe
Number of outputs	1
Output voltage	≥ 10 V DC (40 mA)
Output resistor	≥ 287 Ω (Internal resistance R <sub>e</sub> )
Current limitation	> 40 mA
Response time	< 20 ms
Non-load voltage	> 21.9 V DC
Short-circuit-proof	yes

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## Connection data

Connection method	Screw connection
Stripping length	7 mm
Screw thread	M3
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 AWG	24 ... 14
Tightening torque	0.5 Nm ... 0.6 Nm

## Ex data

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

## Safety data

Input power $P_i$	negligible
Max. internal inductance $L_i$	negligible
Max. internal capacitance $C_i$	negligible
Max. output voltage $U_o$	25.1 V
Max. output current $I_o$	87 mA
Max. output power $P_o$	550 mW
Safety-related maximum voltage $U_m$	253 V AC
	125 V DC
IIB/IIIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	20 mH / 0.83 $\mu$ F
IIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	5 mH / 0.108 $\mu$ F
IIB/IIIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	10 mH / 380 nF, 5 mH / 380 nF, 1 mH / 440 nF, 0.1 mH / 820 nF
IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	2 mH / 52 nF, 1 mH / 65 nF, 0.5 mH / 82 nF, 0.2 mH / 108 nF, 0.1 mH / 108 nF

## Signaling

Status display	Yellow LED (switching state / status, lights up when output circuit is active)
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## Dimensions

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Dimensional drawing	
Width	12.5 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)

## Material specifications

Flammability rating according to UL 94	V0 (Housing)
Housing material	PA 6.6-FR

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20 (not assessed by UL)
Ambient temperature (operation)	-40 °C ... 70 °C (any mounting position, pay attention to the derating curve in the data sheet)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Altitude	≤ 2000 m
Permissible humidity (operation)	10 % ... 95 % (non-condensing)

## Approvals

### CE

Certificate	CE-compliant
Note	and EN 61326

### ATEX

Identification	⊕ II (1) G [Ex ia Ga] IIC/IIB/IIA
	⊕ II (1) D [Ex ia Da] IIIC
	⊕ II 3 (1)G Ex nA [ia IIC Ga] IIC T4 Gc X
Certificate	IBExU 07 ATEX 1133X

### UKCA Ex (UKEX)

Identification	⊕ I (M1) [Ex ia Ma] I
	⊕ II (1) G [Ex ia Ga] IIC
	⊕ II (1) D [Ex ia Da] IIIC
	⊕ II 3 (1) Ex ec [ia Ga] IIC T4 Gc
Certificate	CML 22UKEX3526X

### IECEX

# MACX MCR-EX-SL-SD-21-40-LP - Solenoid driver



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Identification	[Ex ia Ga] IIC/IIB/IIA
	[Ex ia Da] IIIC
	Ex nA [ia IIC Ga] IIC T4 Gc
Certificate	IECEX IBE 08.0002X

## CCC / China-Ex

Identification	[Ex ia Ga] IIC
	[Ex iaD]
	Ex nA [ia Ga] IIC T4 Gc
Certificate	NEPSI GYJ20.1316X

## UL, USA/Canada

Identification	UL 61010 Listed
	Class I, Div. 2, Groups A, B, C, D T4
	Class I, Div. 2, Groups IIC, IIB, IIA T4
	Associated apparatus for use in Class I, Division 1, Groups A,B,C,D
	Associated apparatus for use in Class II, Div.1 Groups E,F,D
	Associated apparatus for use in Class III, Division 1
Certificate	Associated apparatus for use in Class I, Zone 0,1,2, Groups IIC,IIB,IIA
	ⓈⓂⓂ C.D.-No 83104549

## UL, USA/Canada

Identification	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	3
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## INMETRO

Identification	[Ex ia Ga] IIC/IIB/IIA
	[Ex ia Da] IIIC
	Ex nA [ia IIC Ga] IIC T4 Gc
Certificate	DNV 18.0115 X

## EAC Ex

Identification	ⓈⓂⓂ [Ex ia Ga] IIC
	ⓈⓂⓂ [Ex ia Da] IIIC
Certificate	RU C-DE.AB72.B.00093/19

## DNV GL data

Temperature	B
Humidity	B
Vibration	A

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EMC	A
Enclosure	Required protection according to the Rules shall be provided upon installation on board

## EMC data

Noise immunity	EN 61000-6-2
Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4

## Standards and regulations

Electrical isolation	2-way isolation
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### GB Standard

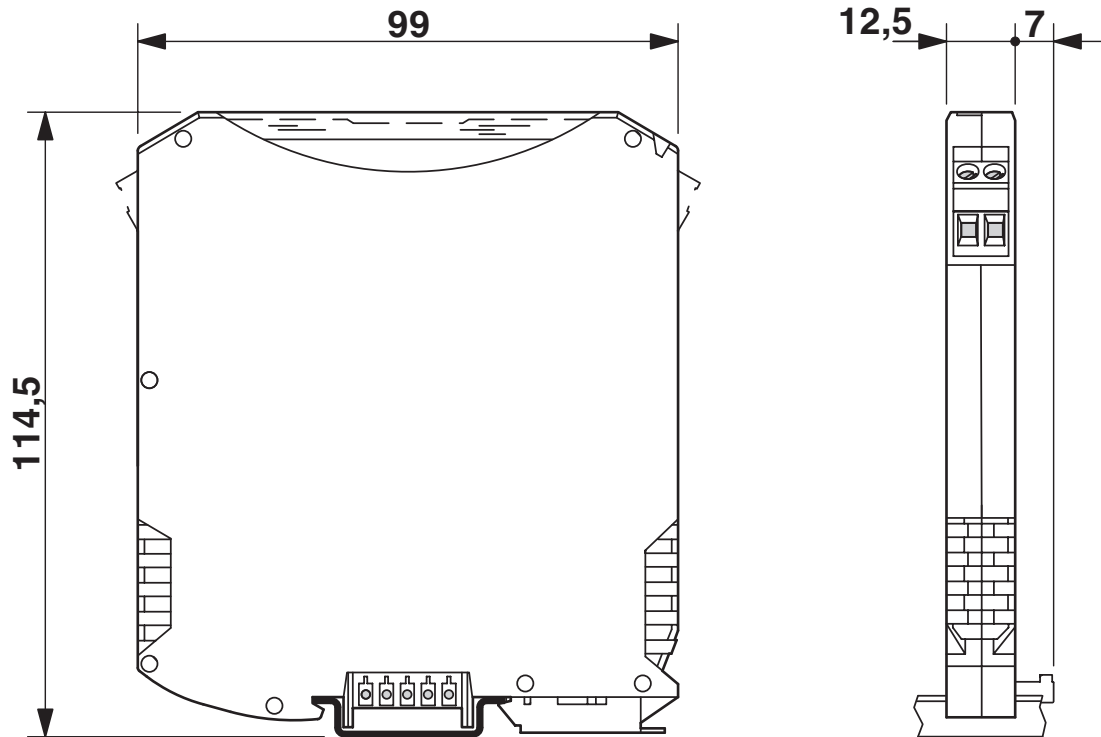
Standards/regulations	GB 3626.20
	GB 3836.1
	GB 3836.4
	GB 3836.8
	GB 12476.1
	GB 12476.4

## Mounting

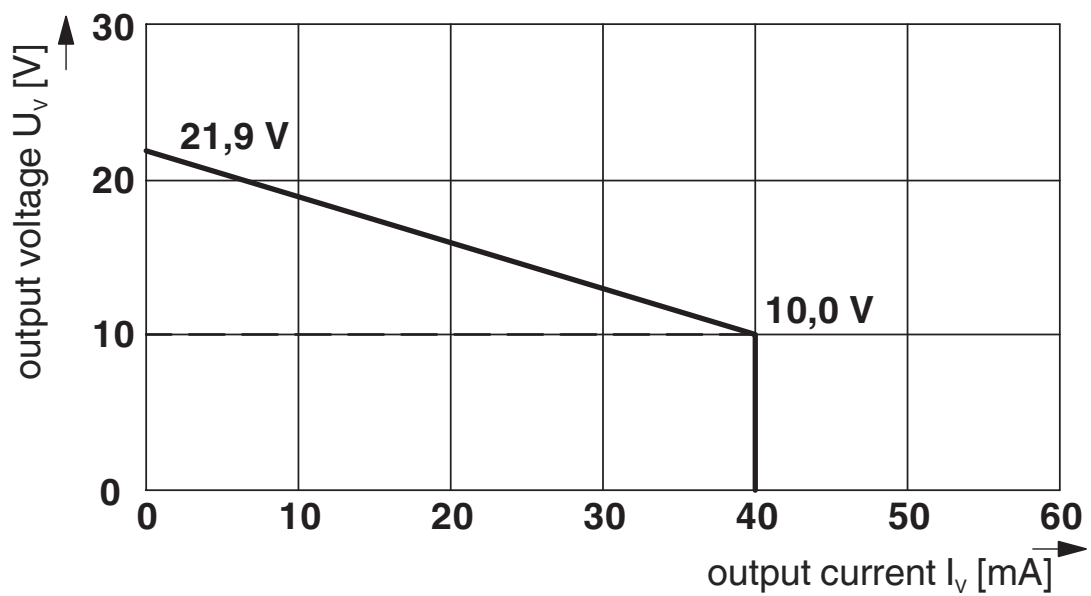
Mounting type	DIN rail mounting
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## Drawings

Dimensional drawing



Diagram





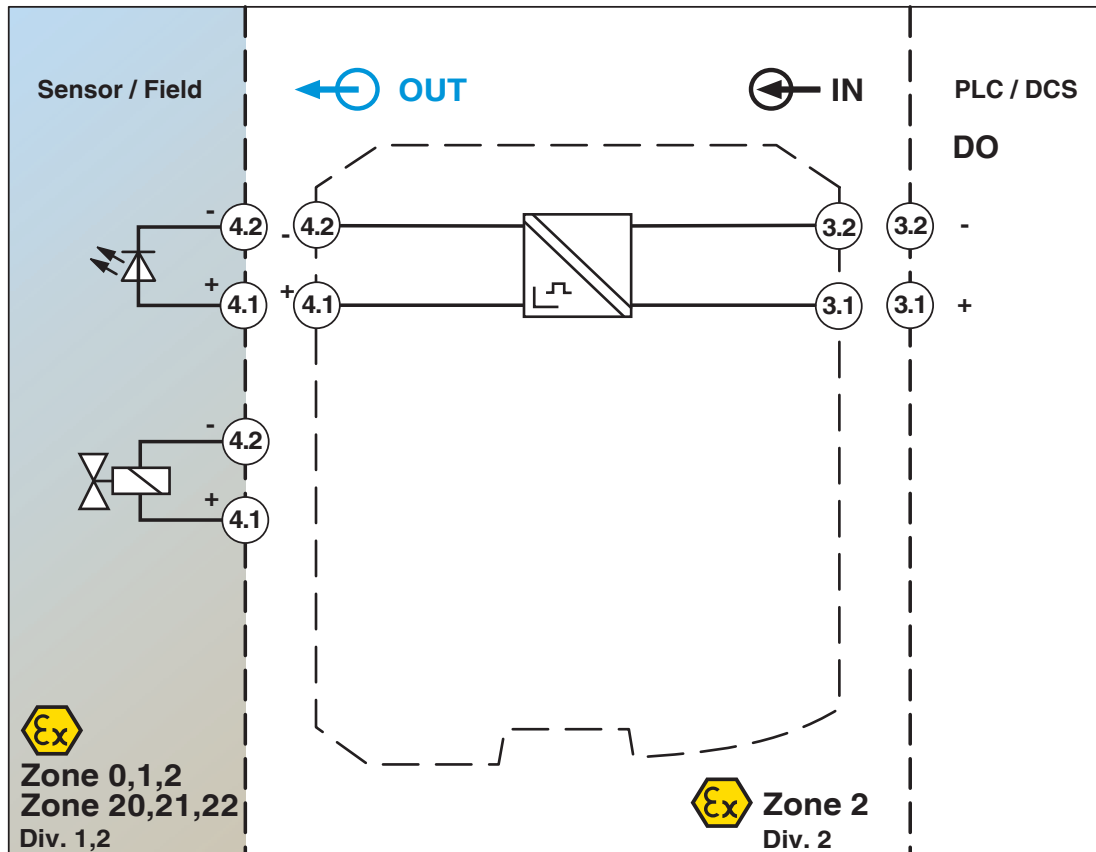
# MACX MCR-EX-SL-SD-21-40-LP - Solenoid driver



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Block diagram



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<https://www.phoenixcontact.com/us/products/2865764>

## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2865764>



**DNV GL**

Approval ID: TAA000020C



**UL Listed**

Approval ID: FILE E 330267



**CCC**

Approval ID: 2020322 316001457



**cUL Listed**

Approval ID: FILE E 330267



**EAC Ex**

Approval ID: RU C-DE.AB72.B.00093



**IECEX**

Approval ID: IECEX IBE 08.0002X



**cUL Listed**

Approval ID: FILE E 199827



**UL Listed**

Approval ID: FILE E 199827



**ATEX**

Approval ID: IBExU 07 ATEX 1133 X

# MACX MCR-EX-SL-SD-21-40-LP - Solenoid driver



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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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# MACX MCR-EX-SL-SD-21-40-LP - Solenoid driver



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## Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	For information on hazardous substances, refer to the manufacturer's declaration available under "Downloads"

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## Accessories

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

2924854

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

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

2865625

<https://www.phoenixcontact.com/us/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/us/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/us/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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## MPS-IH WH - Insulating sleeve

0201663

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

Insulating sleeve, color: white



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## MPS-IH RD - Insulating sleeve

0201676

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

Insulating sleeve, color: red



# MACX MCR-EX-SL-SD-21-40-LP - Solenoid driver

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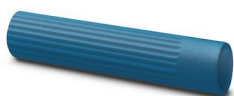


## MPS-IH BU - Insulating sleeve

0201689

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

Insulating sleeve, color: blue



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## MPS-IH YE - Insulating sleeve

0201692

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

Insulating sleeve, color: yellow





# MACX MCR-EX-SL-SD-21-40-LP - Solenoid driver

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## MPS-IH GN - Insulating sleeve

0201702

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

Insulating sleeve, color: green



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## MPS-IH GY - Insulating sleeve

0201728

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

Insulating sleeve, color: gray



# MACX MCR-EX-SL-SD-21-40-LP - Solenoid driver

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<https://www.phoenixcontact.com/us/products/2865764>



## MPS-IH BK - Insulating sleeve

0201731

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

Insulating sleeve, color: black



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## MPS-MT - Test plugs

0201744

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

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



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<https://www.phoenixcontact.com/us/products/2865764>

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

0819291

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



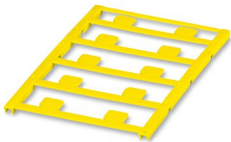
Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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

0822602

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

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

0824547

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



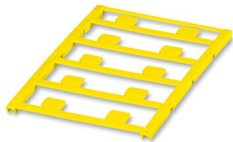
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## UC-EMLP (11X9) YE CUS - Plastic label

0824548

<https://www.phoenixcontact.com/us/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-SD-21-40-LP - Solenoid driver



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

0828094

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



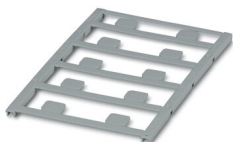
Plastic label, Sheet, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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

0828098

<https://www.phoenixcontact.com/us/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-SD-21-40-LP - Solenoid driver



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

0828789

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

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

0828871

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

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

0828872

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

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

0831678

<https://www.phoenixcontact.com/us/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-SD-21-40-LP - Solenoid driver



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

0831705

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



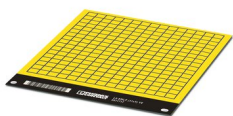
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## LS-EMLP (11X9) YE - Device marker

0831732

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



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