

Solenoid driver - MACX MCR-EX-SL-SD-21-25-LP-SP - 2924113

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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 25 mA. For gases up to Group IIC, loop-powered, electrical isolation, SIL 3. Push-in 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.
- ✓ Installation in zone 2, protection type "n" (EN 60079-15) permitted
- ✓ Up to SIL 3 according to IEC 61508
- ✓ 2-way electrical isolation
- ✓ Output [Ex ia] IIC/[Ex ia] IIB
- ✓ Input: 19.2 V DC ... 30 V DC



Key Commercial Data

Packing unit	1 pc
GTIN	
GTIN	4046356338516

Technical data

Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
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Dimensions

Width	12.5 mm
Height	116.9 mm
Depth	113.7 mm

Ambient conditions

Ambient temperature (operation)	-40 °C ... 60 °C (Any mounting position)
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Ambient conditions

Ambient temperature (storage/transport)	-40 °C ... 80 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Degree of protection	IP20 (not assessed by UL)
Noise immunity	EN 61000-6-2

Output data

Minimum output voltage	5.5 V DC (At 25 mA)
Output characteristic curve: Output resistor	641.1 Ω (Internal resistance R _i)
Response time	20 ms

Compatible valves

Note	This is an extract of possible combinations of valves and solenoid drivers.
Compatible valve	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
	Samson Coil 3701-11 (6 V)
	Samson Coil 3701-12 (12 V)
	Samson Coil 3701-13 (24 V)
	Samson Coil 3963-11 (6 V)
	Samson Coil 3963-12 (12 V)
	Samson Coil 3963-13 (24 V)
	Samson Coil 3964-11 (6 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

Power supply

Power dissipation	< 0.845 W
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Connection data

Connection method	Push-in connection
Stripping length	8 mm
Conductor cross section solid	0.2 mm ² ... 1.5 mm ²
Conductor cross section flexible	0.2 mm ² ... 1.5 mm ²
Conductor cross section AWG	24 ... 16

General

No. of channels	1
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Technical data

General

Maximum temperature coefficient	0.01 %/K
Status display	Yellow LED (switching state / status, lights up when output circuit is active)
Degree of pollution	2
Overvoltage category	II
Electromagnetic compatibility	Conformance with EMC directive
Interference emission	EN 61000-6-4
Housing material	PA 6.6-FR
Color	gray
Designation	Output/input
Electrical isolation	375 V (Peak value in accordance with IEC/EN 60079-11)

Safety characteristic data

Integrity requirement	IEC 61508 - Low demand
Equipment type	Type A
Safety Integrity Level (SIL)	3
Safe Failure Fraction (SFF)	100 %
λ_{SU}	2.84×10^{-7} (284 FIT)
λ_{SD}	0
λ_{DU}	0
λ_{DD}	0
Probability of a hazardous failure on demand (PFD _{AVG})	0 (1 year)
	0 (5 years)
	0 (10 years)
Diagnostic coverage (DC)	DC _S =0 %, DC _D =0 %

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	39 mA
Max. output power P _o	245 mW
Group	IIC
Max. external inductivity L _o	22 mH
Max. external capacitance C _o	0.108 µF
Additional text	simple circuit
Group	IIC
Max. external inductivity L _o	20 mH
Max. external capacitance C _o	68 nF
Additional text	mixed circuit

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Technical data

Safety data

Group	IIC
Max. external inductivity L_o	10 mH
Max. external capacitance C_o	68 nF
Additional text	mixed circuit
Group	IIC
Max. external inductivity L_o	5 mH
Max. external capacitance C_o	68 nF
Additional text	mixed circuit
Group	IIC
Max. external inductivity L_o	1 mH
Max. external capacitance C_o	79 nF
Additional text	mixed circuit
Group	IIC
Max. external inductivity L_o	0.1 mH
Max. external capacitance C_o	108 nF
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	90 mH
Max. external capacitance C_o	0.83 μ F
Additional text	simple circuit
Group	IIB/IIIC
Max. external inductivity L_o	100 mH
Max. external capacitance C_o	270 nF
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	5 mH
Max. external capacitance C_o	430 nF
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	1 mH
Max. external capacitance C_o	470 nF
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	0.1 mH
Max. external capacitance C_o	830 nF
Additional text	mixed circuit
Safety-related maximum voltage U_m	253 V AC (125 V DC)

Standards and Regulations

Electromagnetic compatibility	Conformance with EMC directive
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Technical data

Standards and Regulations

Noise emission	EN 61000-6-4
Conformance	CE-compliant, additionally EN 61326
ATEX	# 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
IECEX	[Ex ia Ga] IIC/IIB/IIA
	[Ex ia Da] IIIC
	Ex nA [ia IIC Ga] IIC T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
DNV GL-Temperature	B
DNV GL-Humidity	B
DNV GL-Vibration	A
DNV GL-EMC	A
DNV GL-Enclosure	Required protection according to the Rules shall be provided upon installation on board
Group	IIC
	IIC
	IIC
	IIC
	IIC
	IIC

Conformance/approvals

Designation	CE
Identification	CE-compliant
Additional text	and EN 61326
Designation	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
Designation	IECEX
Identification	[Ex ia Ga] IIC/IIB/IIA
	[Ex ia Da] IIIC
	Ex nA [ia IIC Ga] IIC T4 Gc
Certificate	IECEX IBE 08.0002X
Designation	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

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Technical data

Conformance/approvals

	Associated apparatus for use in Class II, Div.1 Groups E,F,D
	Associated apparatus for use in Class III, Division 1
	Associated apparatus for use in Class I, Zone 0,1,2, Groups IIC,IIB,IIA
Certificate	#, C.D.-No 83104549
Designation	UL, USA/Canada
Identification	Class I Div 2; IS for Class I, II, III Div 1
Certificate	#, C.D.-No 83104549
Designation	Shipbuilding approval
Certificate	DNV GL TAA000020C
Designation	Safety Integrity Level (SIL, IEC 61508)
Identification	3
Designation	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
Designation	EAC Ex
Identification	# [Ex ia Ga] IIC
	# [Ex ia Da] IIIC
Certificate	RU C-DE.AB72.B.00093/19
Temperature	B
Humidity	B
Vibration	A
EMC	A
Enclosure	Required protection according to the Rules shall be provided upon installation on board

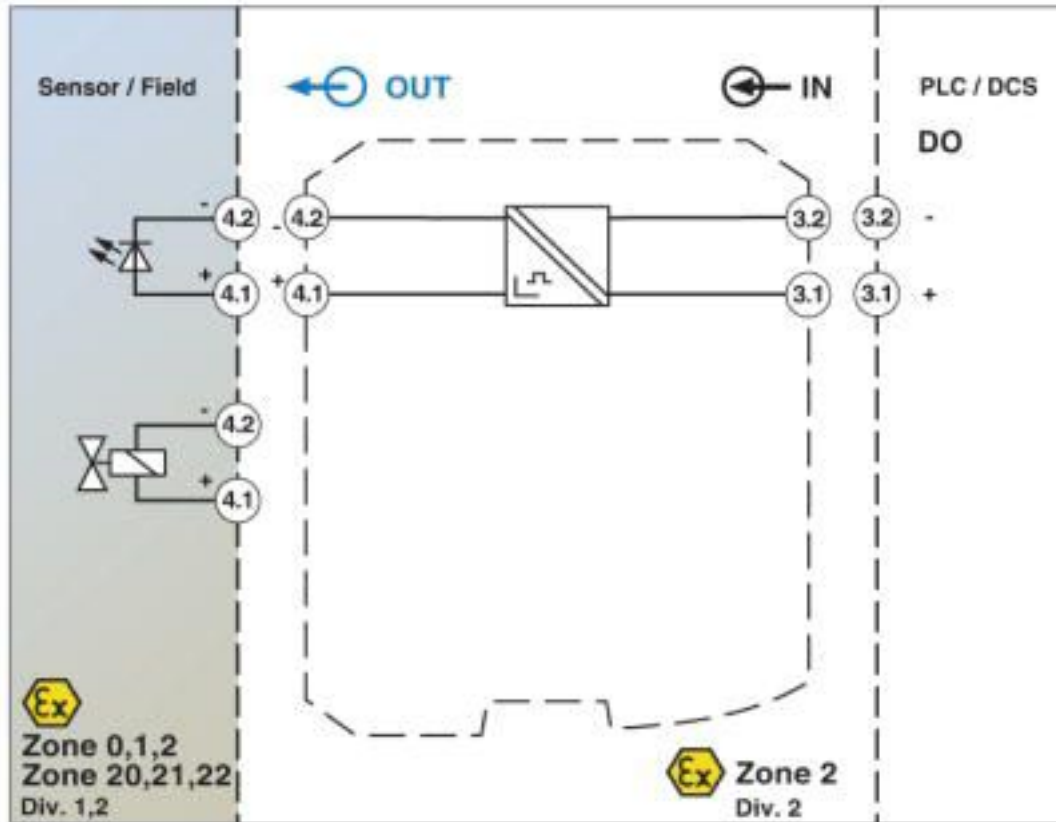
Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

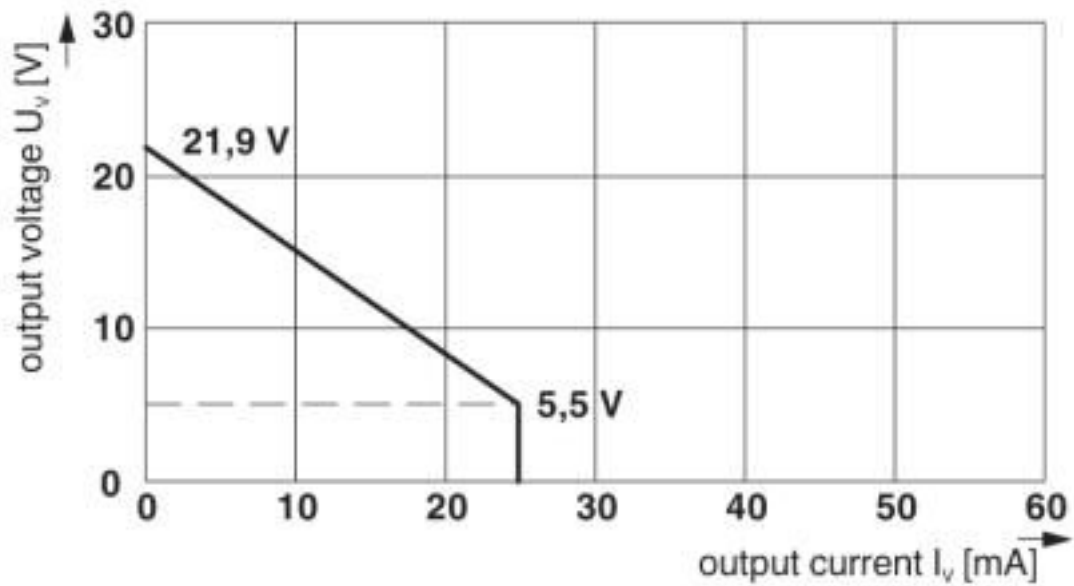
Drawings

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Block diagram

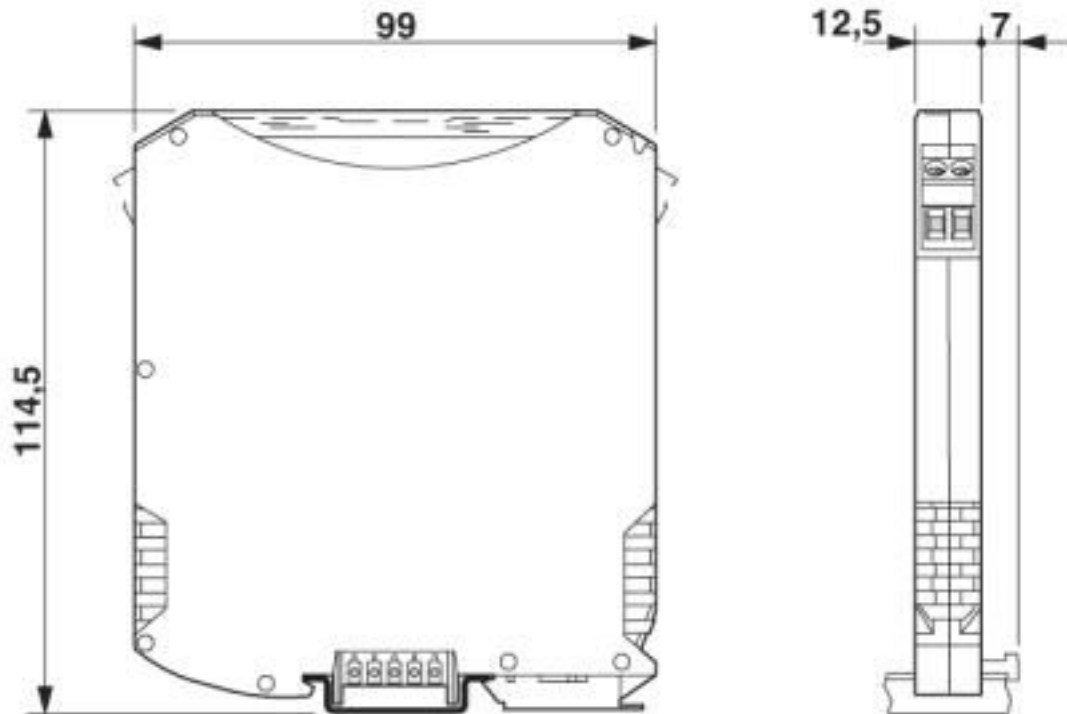


Diagram

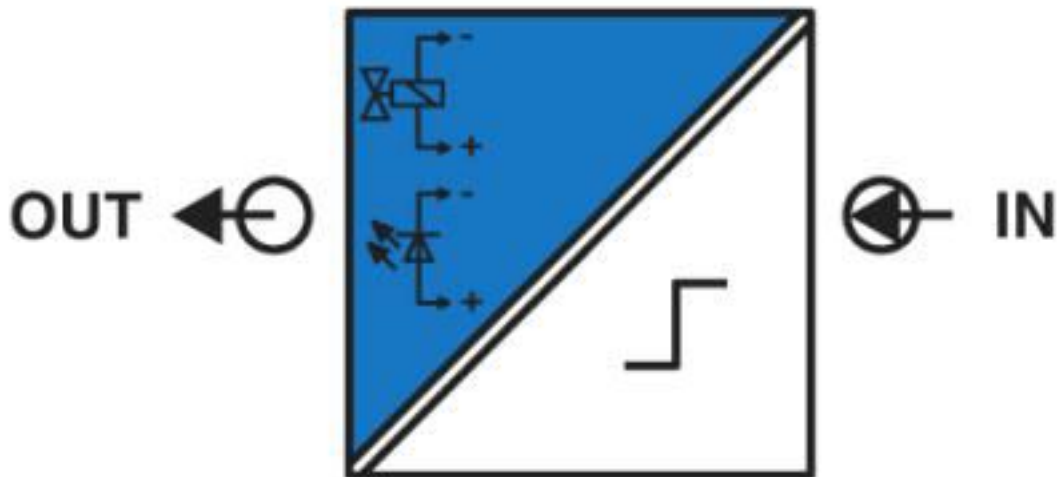


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Dimensional drawing



Pictogram



Classifications

eCl@ss

eCl@ss 10.0.1	27210120
eCl@ss 4.0	27210100
eCl@ss 4.1	27210100
eCl@ss 5.0	27210100

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Classifications

eCl@ss

eCl@ss 5.1	27210100
eCl@ss 6.0	27210100
eCl@ss 7.0	27210120
eCl@ss 8.0	27210120
eCl@ss 9.0	27210120

ETIM

ETIM 4.0	EC002653
ETIM 5.0	EC002653
ETIM 6.0	EC002653
ETIM 7.0	EC002653

UNSPSC

UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	39121008
UNSPSC 18.0	39121008
UNSPSC 19.0	39121008
UNSPSC 20.0	39121008
UNSPSC 21.0	39121008

Approvals

Approvals

Approvals

DNV GL / UL Listed / cUL Listed / Functional Safety

Ex Approvals

IECEX / ATEX / EAC Ex / UL Listed / cUL Listed / INMETRO

Approval details

DNV GL		https://approvalfinder.dnvgl.com/	TAA000020C
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Approvals

UL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 330267
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cUL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 330267
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Functional Safety			16/04-017 R025 V1R1
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Accessories

Accessories

Device marking

Plastic label - UC-EMLP (11X9) - 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

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

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

Plastic label - US-EMLP (11X9) - 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

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

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

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

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

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



Insulating sleeve

Insulating sleeve - MPS-IH BK - 0201731

Insulating sleeve, color: black



Insulating sleeve - MPS-IH GY - 0201728

Insulating sleeve, color: gray



Insulating sleeve - MPS-IH GN - 0201702

Insulating sleeve, color: green



Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow



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Accessories

Insulating sleeve - MPS-IH BU - 0201689

Insulating sleeve, color: blue



Insulating sleeve - MPS-IH RD - 0201676

Insulating sleeve, color: red



Insulating sleeve - MPS-IH WH - 0201663

Insulating sleeve, color: white



Labeled device marker

Plastic label - UC-EMLP (11X9) CUS - 0824547



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

Plastic label - UC-EMLP (11X9) YE CUS - 0824548



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

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Accessories

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

Module carrier

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

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

Power module

Power and error message module - MACX MCR-PTB - 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

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

Test plug terminal block

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Accessories

Test plugs - MPS-MT - 0201744



Test plugs, with solder connection up to 1 mm² conductor cross section, color: gray

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