

Solenoid driver - MACX MCR-EX-SL-SD-21-25-LP - 2865492

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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. 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.
- ✓ 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 |  4 046356 160551 |
| GTIN | 4046356160551 |
| Weight per Piece (excluding packing) | 147.500 g |
| Weight per piece (including packing) | 164.800 g |
| Custom tariff number | 85437090 |
| Country of origin | Germany |
| Note | Made to Order (non-returnable) |

Technical data

Note

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

Dimensions

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Technical data

Dimensions

| | |
|--------|----------|
| Width | 12.5 mm |
| Height | 112.5 mm |
| Depth | 114.5 mm |

Ambient conditions

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

| | |
|--|---|
| 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 |
|-------------------|-----------|

Connection data

| | |
|-------------------|------------------|
| Connection method | Screw connection |
| Stripping length | 7 mm |
| Screw thread | M3 |

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Connection data

| | |
|----------------------------------|---|
| Conductor cross section solid | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross section flexible | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross section AWG | 24 ... 14 |
| Torque | 0.5 Nm ... 0.6 Nm |

General

| | |
|---------------------------------|--|
| No. of channels | 1 |
| 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) |
| Rated insulation voltage | 300 V _{rms} |
| Test voltage | 2.5 kV AC (50 Hz, 1 min.) |
| Insulation | Safe isolation in accordance with IEC/EN 61010-1 |

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 |

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Technical data

Safety data

| | |
|--|----------------|
| 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 |
| 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 µF |
| 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 |

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Safety data

| | |
|---|---------------------|
| 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 |
| Noise emission | EN 61000-6-4 |
| Designation | GB Standard |
| Standards/regulations | GB 3626.20 |
| | GB 3836.1 |
| | GB 3836.4 |
| | GB 3836.8 |
| | GB 12476.1 |
| | GB 12476.4 |
| 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 |

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Technical data

Conformance/approvals

| | |
|----------------|---|
| 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 | CCC / China-Ex |
| Identification | [Ex ia Ga] IIC |
| | [Ex iaD] |
| | Ex nA [ia Ga] IIC T4 Gc |
| Certificate | NEPSI GYJ20.1316X |
| 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 |
| | 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 |

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Technical data

Conformance/approvals

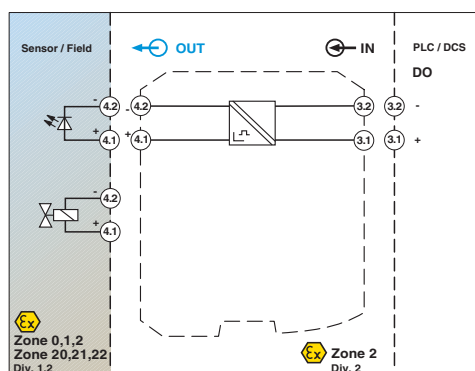
| | |
|-------------|---|
| Temperature | B |
| Humidity | B |
| Vibration | A |
| EMC | A |
| Enclosure | Required protection according to the Rules shall be provided upon installation on board |

Environmental Product Compliance

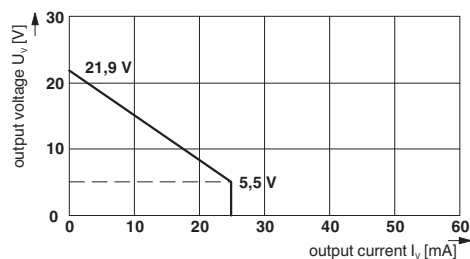
| | |
|------------|---|
| REACH SVHC | Lead 7439-92-1 |
| China RoHS | Environmentally Friendly Use Period = 50 years |
| | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

Drawings

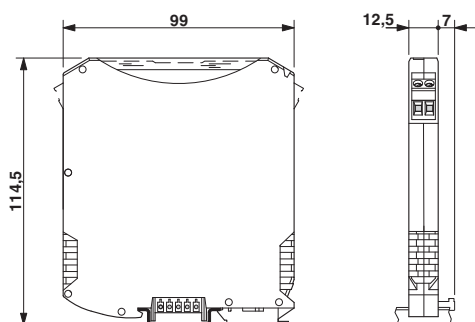
Block diagram



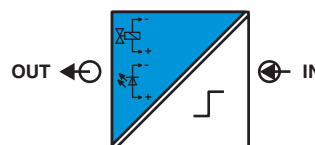
Diagram



Dimensional drawing



Pictogram



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Classifications

eCl@ss

| | |
|---------------|----------|
| eCl@ss 10.0.1 | 27210120 |
| eCl@ss 11.0 | 27210120 |
| eCl@ss 4.0 | 27210100 |
| eCl@ss 4.1 | 27210100 |
| eCl@ss 5.0 | 27210100 |
| eCl@ss 5.1 | 27210100 |
| eCl@ss 6.0 | 27210100 |
| eCl@ss 7.0 | 27210120 |
| eCl@ss 9.0 | 27210120 |

ETIM

| | |
|----------|----------|
| ETIM 4.0 | 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

UL Listed / cUL Listed / Functional Safety / DNV GL / CCC / cULus Listed

Ex Approvals

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

Approval details

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Approvals

| | | | |
|-----------|--|---|---------------|
| UL Listed | | http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm | FILE E 330267 |
|-----------|--|---|---------------|

| | | | |
|------------|--|---|---------------|
| cUL Listed | | http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm | FILE E 330267 |
|------------|--|---|---------------|

| | | | |
|-------------------|--|--|------------------------|
| Functional Safety | | | 16/04-017 R025 V1R1 |
|-------------------|--|--|------------------------|

| | | | |
|--------|--|---|------------|
| DNV GL | | https://approvalfinder.dnvgl.com/ | TAA000020C |
|--------|--|---|------------|

| | | | |
|-----|--|--|-------------------|
| CCC | | | 2020322 316001457 |
|-----|--|--|-------------------|

| | | | |
|--------------|--|--|--|
| cULus Listed | | | |
|--------------|--|--|--|

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

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Accessories

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

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

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Accessories

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



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



Solenoid driver - MACX MCR-EX-SL-SD-21-25-LP - 2865492

Accessories

Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow



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

Solenoid driver - MACX MCR-EX-SL-SD-21-25-LP - 2865492

Accessories

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

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

Solenoid driver - MACX MCR-EX-SL-SD-21-25-LP - 2865492

Accessories

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

Test plugs - MPS-MT - 0201744



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