# MACX MCR-EX-SL-SD-24-48-LP-SP - Solenoid driver

2924126

https://www.phoenixcontact.com/gb/products/2924126

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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 48 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 in accordance with IEC 61508
- 2-way electrical isolation
- Input: 19.2 V DC … 30 V DC
- Output: [Ex ia] IIC/[Ex ia] IIB

## Commercial data

| | |
|---|---|
| Item number | 2924126 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | DK1214 |
| Product key | DK1214 |
| GTIN | 4046356338486 |
| Weight per piece (including packing) | 159.5 g |
| Weight per piece (excluding packing) | 145 g |
| Customs tariff number | 85437090 |
| Country of origin | DE |

## Technical data

### Product properties

| | |
|---|---|
| Product type | Solenoid driver |
| Product family | MACX Analog |
| No. of channels | 1 |
| Compatible valve | ASCO Coil 195 |
| | ASCO Coil 302 (12 V) |
| | 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 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 |
| | FESTO Coil MFH-...IA-SA-EX GBXE022AIAD03 |
| | FESTO Coil (J)MFH-...BIA-SA-EX GBXE022AIAD03 |
| | Norgren Herion Coil 2050 |
| | Norgren Herion Coil 2051 |
| | Norgren Herion Coil 2052 |
| | Norgren Herion Coil 2053 |
| | Norgren Herion Coil 2080 / 2082 |
| | Norgren Herion Coil 2081 / 2083 |
| | Norgren Herion Coil 2084 |
| | Norgren Herion Coil 3039 |
| | Nass Coil 1259 30.1-00 |
| | Nass Coil 1259 50.1-00 |
| | 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) |
| | 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 |
| | Seitz Solenoid coil 11 G 52 |
| Note | This is an extract of possible combinations of valves and solenoid drivers. |

## Electrical properties

| | |
|---|---|
| Electrical isolation | 2-way isolation |
| Electrical isolation between input and output | yes |
| Maximum temperature coefficient | 0.01 %/K |

Electrical isolation

| | |
|---|---|
| Test voltage | 2.5 kV AC (50 Hz, 60 s) |
| Overvoltage category | II |
| Pollution degree | 2 |

Electrical isolation Output/input IEC/EN 60079-11

| | |
|---|---|
| Standards/regulations | IEC/EN 60079-11 |
| Rated insulation voltage | 375 $V_{PP}$ |

Electrical isolation Output/input IEC/EN 61010-1

| | |
|---|---|
| Standards/regulations | IEC/EN 61010-1 |
| Rated insulation voltage | 300 $V_{rms}$ |
| Insulation | Safe isolation |

Supply

| | |
|---|---|
| Supply voltage range | loop-powered, no external supply necessary |
| Power dissipation | < 1.41 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 | 85 mA ($U_e$ = 24 V DC) |

## Output data

Signal: Voltage

| | |
|---|---|
| Output description | intrinsically safe |
| Number of outputs | 1 |
| Output voltage | ≥ 10.5 V DC (48 mA) |
| Current limitation | > 48 mA |
| Response time | < 20 ms |
| Open-circuit voltage | > 24 V DC |

| | |
|---|---|
| Short-circuit-proof | yes |

## Connection data

| | |
|---|---|
| Connection method | Push-in connection |
| Stripping length | 10 mm |
| Conductor cross-section rigid | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section flexible (2 conductors with same cross section) | 0.25 mm² ... 0.34 mm² (TWIN ferrule without plastic sleeve) |
| | 0.5 mm² ... 1.5 mm² (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] |
| | [Div. 1] |

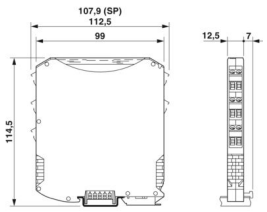
Safety data

| | |
|---|---|
| Input power $P_i$ | negligible |
| Max. internal inductance $L_i$ | negligible |
| Max. internal capacitance $C_i$ | negligible |
| Max. output voltage $U_o$ | 27.7 V |
| Max. output current $I_o$ | 101 mA |
| Max. output power $P_o$ | 697 mW |
| Maximum internal resistance $R_i$ | 275.7 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 $C_o$ | 27.9 mH / 2.2 µF |
| IIB/IIIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 13.9 mH / 0.663 µF |
| IIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 3.5 mH / 0.085 µF |
| IIA/I (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 20 mH / 440 nF, 1 mH / 500 nF, 0.1 mH / 960 nF |
| IIB/IIIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 5 mH / 200 nF, 1 mH / 300 nF, 0.15 mH / 500 nF |
| IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 0.5 mH / 50 nF, 0.15 mH / 100 nF |

## Signaling

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

## 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 (Housing) | 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 ... 60 °C (Any mounting position) |
| | -40 °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) | -40 °C ... 70 °C |
| Safety-related maximum voltage $U_m$ | 253 V AC |
| | 125 V DC |
| Rated insulation voltage | 375 $V_{PP}$ (IEC/EN 60079-11) |
| | 265 V ($U_{Isolation\ rated\ "ec"}$) |

### Altitude range (≤ 3000 m)

| | |
|---|---|
| Height range | > 2000 m ... 3000 m |
| Ambient temperature (operation) | -40 °C ... 63 °C |
| Safety-related maximum voltage $U_m$ | 190 V AC |
| | 110 V DC |
| Rated insulation voltage | 190 V (IEC/EN 60079-11) |
| | 190 V ($U_{Isolation\ rated\ "ec"}$) |

Altitude range (≤ 4000 m)

| | |
|---|---|
| Height range | > 3000 m ... 4000 m |
| Ambient temperature (operation) | -40 °C ... 56 °C |
| Safety-related maximum voltage $U_m$ | 60 V |
| Rated insulation voltage | 60 V (IEC/EN 60079-11) |
| | 60 V ($U_{Isolation\ rated\ "ec"}$) |

Altitude range (≤ 5000 m)

| | |
|---|---|
| Height range | > 4000 m ... 5000 m |
| Ambient temperature (operation) | -40 °C ... 49 °C |
| Safety-related maximum voltage $U_m$ | 60 V |
| Rated insulation voltage | 60 V (IEC/EN 60079-11) |
| | 60 V ($U_{Isolation\ rated\ "ec"}$) |

## Approvals

CE

| | |
|---|---|
| Certificate | CE-compliant |
| Note | and EN 61326 |

ATEX

| | |
|---|---|
| Identification | Ⓔx I (M1) [Ex ia Ma] I |
| | Ⓔx II (1) G [Ex ia Ga] IIC |
| | Ⓔx II (1) D [Ex ia Da] IIIC |
| | Ⓔx II 3(1) G Ex ec [ia Ga] IIC T4 Gc |
| Certificate | IBExU 07 ATEX 1133X |

IECEx

| | |
|---|---|
| Identification | [Ex ia Ma] I |
| | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex ec [ia Ga] IIC T4 Gc |
| Certificate | IECEx IBE 08.0002X |

CCC / China-Ex

| | |
|---|---|
| Identification | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex ec [ia Ga] IIC T4 Gc |
| Certificate | 2022122316115980 |

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,G |

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

Shipbuilding approval

| | |
|---|---|
| Certificate | DNV GL TAA000020C |

Safety Integrity Level (SIL, IEC 61508)

| | |
|---|---|
| Identification | 3 |

INMETRO

| | |
|---|---|
| Identification | [Ex ia Ma] I |
| | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex ec [ia Ga] IIC T4 Gc |
| Certificate | DNV 18.0115 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 |

Noise emission

| | |
|---|---|
| Standards/regulations | EN 61000-6-4 |

## Standards and regulations

| | |
|---|---|
| Electrical isolation | 2-way isolation |

GB Standard

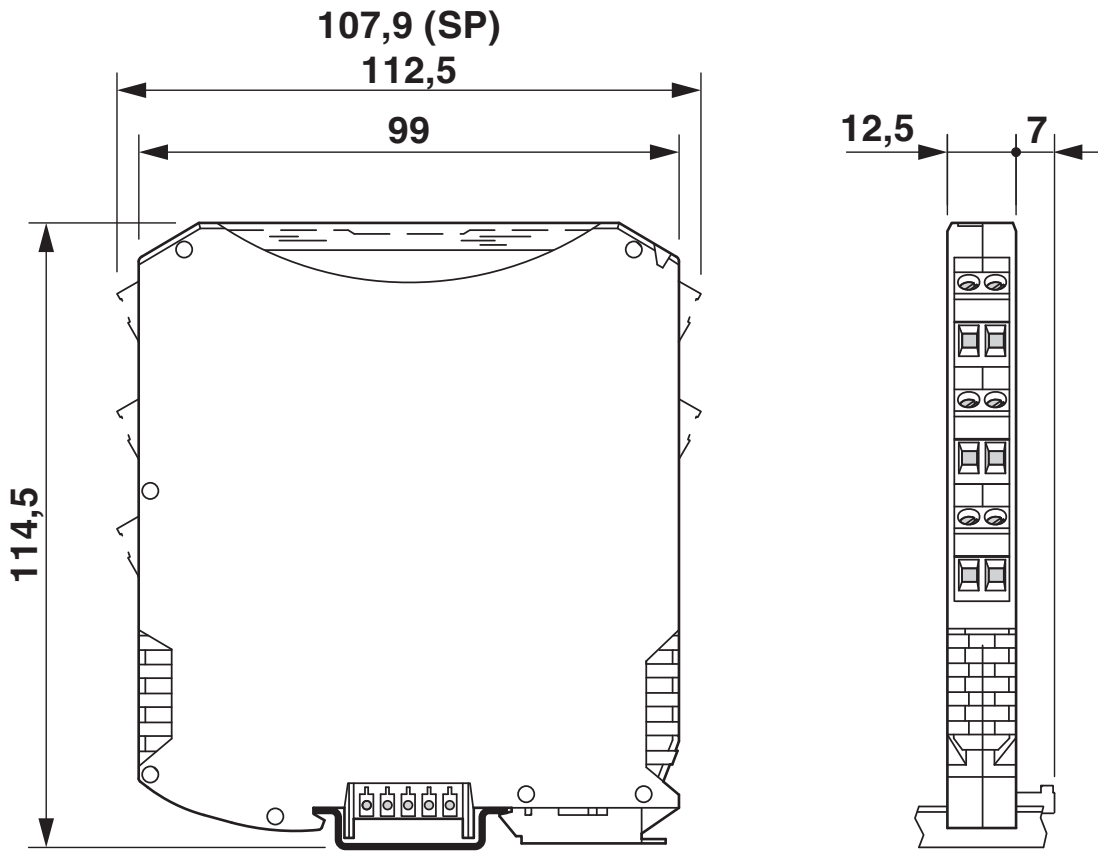
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|---|---|
| Standards/regulations | GB/T 3836.1 |
| | GB/T 3836.3 |
| | GB/T 3836.4 |

## Mounting

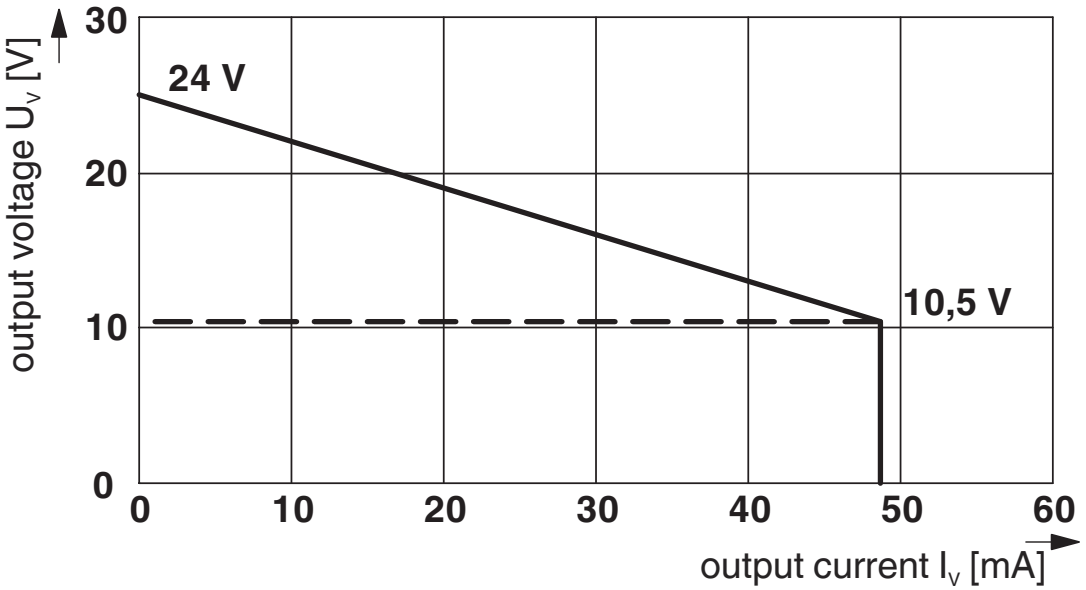
| | |
|---|---|
| Mounting type | DIN rail mounting |

## Drawings

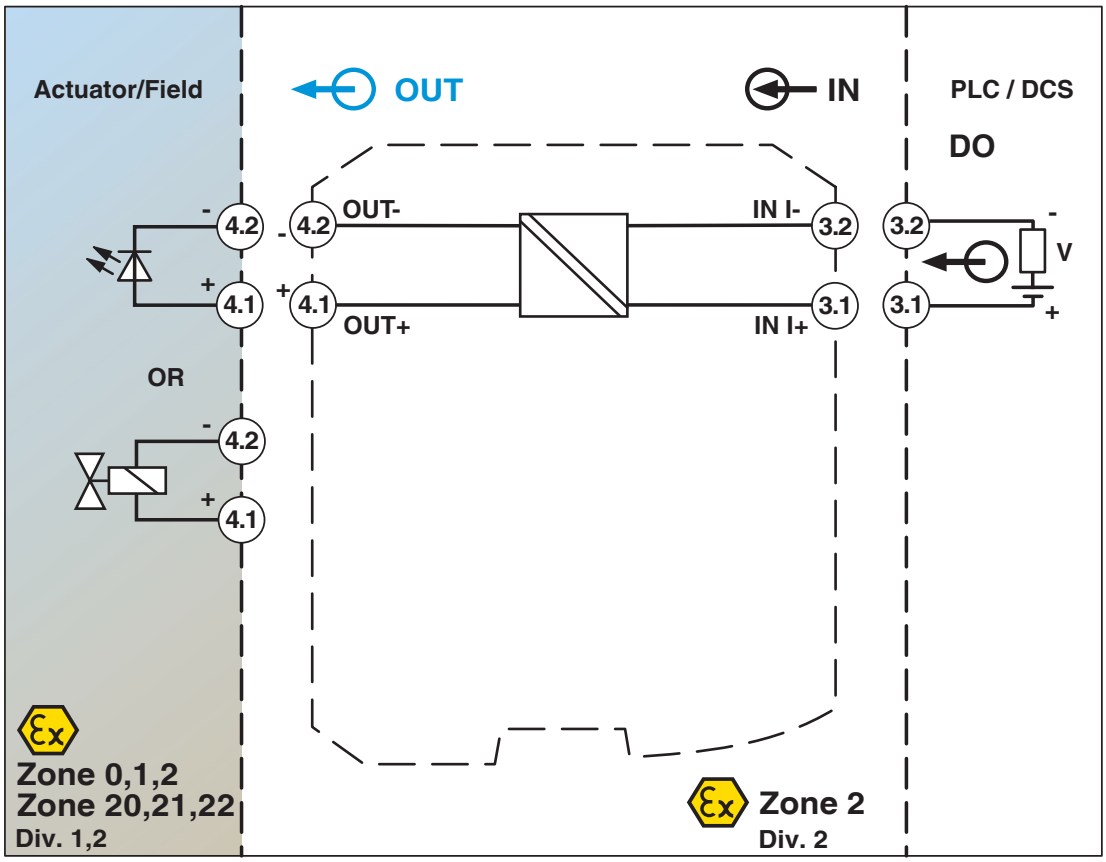
Dimensional drawing




Diagram



Block diagram



## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/gb/products/2924126

**DNV**
Approval ID: TAA000020C

**UL Listed**
Approval ID: E330267

**cUL Listed**
Approval ID: E330267

**Functional Safety**
Approval ID: 16/04-017 R025 V1R1

**IECEx**
Approval ID: IECEx IBE 08.0002X

**CCC**
Approval ID: 2022122316115980

**cUL Listed**
Approval ID: E199827

**UL Listed**
Approval ID: E199827

**ATEX**
Approval ID: IBExU 07 ATEX 1133 X

**INMETRO**
Approval ID: DNV 18.0115 X

## Classifications

### ECLASS

| | |
|---|---|
| ECLASS-13.0 | 27210120 |
| ECLASS-15.0 | 27210120 |

### ETIM

| | |
|---|---|
| ETIM 10.0 | EC002653 |

### UNSPSC

| | |
|---|---|
| UNSPSC 21.0 | 39121000 |

## 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 | 40d7d063-f09f-492a-9b0d-651c6b15ff12 |

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