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

2865609

https://www.phoenixcontact.com/us/products/2865609

Please be informed that the data shown in this PDF document is generated from our online catalog. Please find the complete data in the user documentation. Our general terms of use for downloads are valid.



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. 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 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 | 2865609 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | C430 |
| Product key | DK1214 |
| GTIN | 4046356158411 |
| Weight per piece (including packing) | 163.5 g |
| Weight per piece (excluding packing) | 113.7 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 | Screw connection |
| Stripping length | 7 mm |
| Screw thread | M3 |
| Conductor cross-section rigid | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section AWG | 24 ... 14 |
| Tightening torque | 0.5 Nm ... 0.6 Nm |

Test socket

| | |
|---|---|
| Max. diameter | 2 mm |

## Ex data

| | |
|---|---|
| Ex installation (EPL) | Gc |
| | Div. 2 |
| Ex i circuits (EPL) | [Ga] |
| | [Da] |
| | [Ma] |
| | [Div. 1] |

Safety data

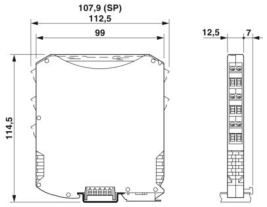
| | |
|---|---|
| Input power $P_i$ | negligible |
| Max. internal inductance $L_i$ | negligible |
| Max. internal capacitance $C_i$ | negligible |
| Max. output voltage $U_o$ | 27.7 V |
| Max. output current $I_o$ | 101 mA |
| Max. output power $P_o$ | 697 mW |
| Maximum internal resistance $R_i$ | 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 | 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

| | |
|---|---|
| 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 | cULus 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

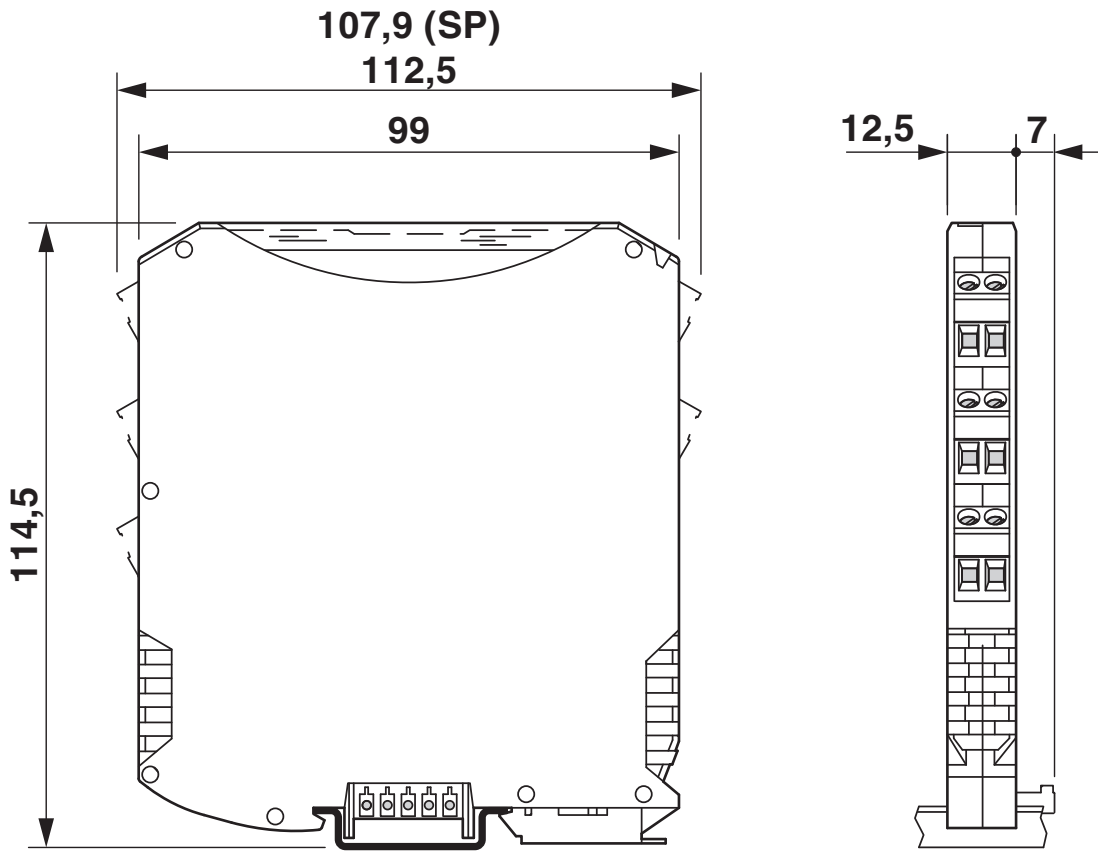
| | |
|---|---|
| Standards/regulations | GB/T 3836.1 |
| | GB/T 3836.3 |
| | GB/T 3836.4 |

## Mounting

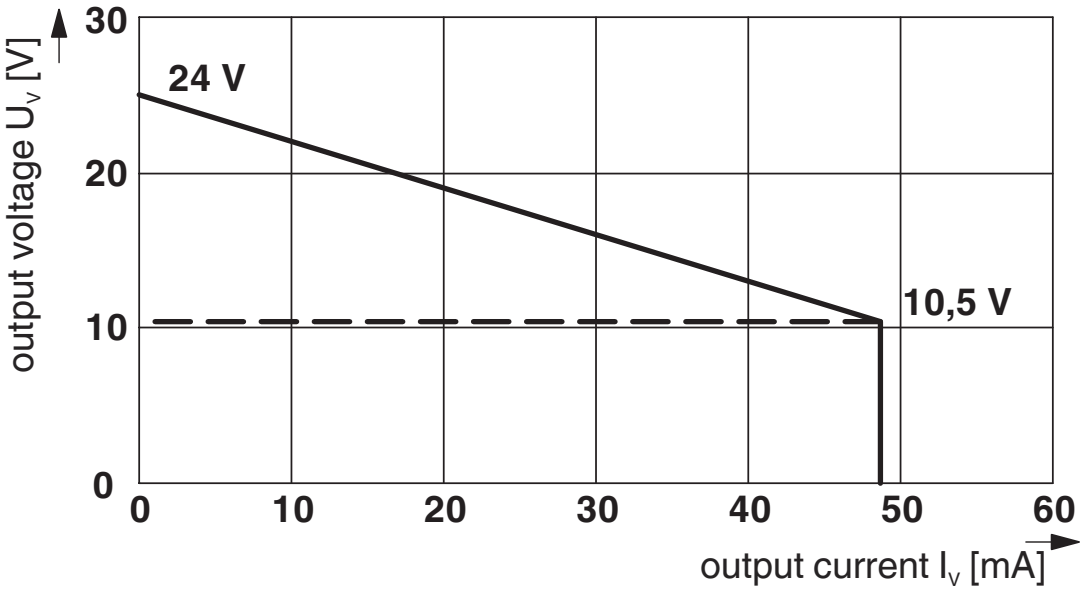
| | |
|---|---|
| Mounting type | DIN rail mounting |

## Drawings

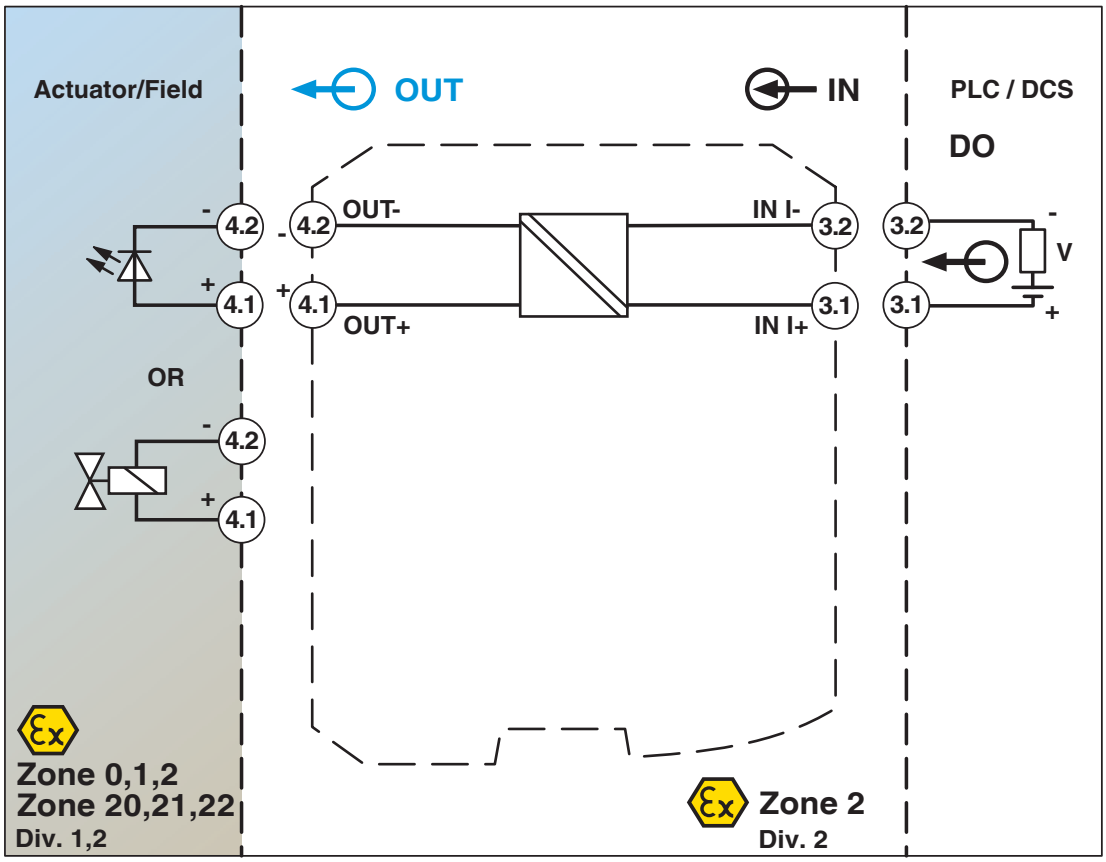
Dimensional drawing




Diagram



Block diagram



## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2865609

**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 | e426a61f-c59a-47a3-b935-75599b66e5fe |


Phoenix Contact 2026 © - all rights reserved
https://www.phoenixcontact.com



Phoenix Contact USA
586 Fulling Mill Road
Middletown, PA 17057, United States
(+717) 944-1300
info@phoenixcon.com