

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 | DK1214 |
| 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

Product properties

| | |
|----------------------------------|---|
| Product type | Solenoid driver |
| Product family | MACX Analog |
| No. of channels | 1 |
| 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) |
| | 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 | |

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| | |
|------|---|
| | Seitz Pilot valve PV 12F73 Xi oH-2 |
| 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 | < 1.055 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 _e = 24 V DC) |

Output data

Signal: Voltage

| | |
|----------------------|--------------------|
| Output description | intrinsically safe |
| Number of outputs | 1 |
| Output voltage | ≥ 10 V DC (40 mA) |
| Current limitation | > 40 mA |
| Response time | < 20 ms |
| Open-circuit voltage | > 21.9 V DC |
| Short-circuit-proof | yes |

Connection data

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

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| | |
|----------------------------------|---|
| Screw thread | M3 |
| Conductor cross-section rigid | 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 |
| 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 | 25.1 V |
| Max. output current I_o | 87 mA |
| Max. output power P_o | 550 mW |
| Maximum internal resistance R_i | 287 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 | 37.6 mH / 2.93 μ F |
| IIB/IIIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 18.8 mH / 0.83 μ F |
| IIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 4.7 mH / 0.108 μ F |
| IIA/I (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 20 mH / 600 nF, 5 mH / 610 nF, 1 mH / 640 nF, 0.1 mH / 1000 nF |
| IIB/IIIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 5 mH / 300 nF, 0.5 mH / 500 nF |
| IIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 2 mH / 50 nF, 0.5 mH / 70 nF, 0.15 mH / 100 nF |

Signaling

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

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

| | |
|--|-----------------|
| 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 ($U_{\text{Isolation rated "ec"}}$) |

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 ($U_{\text{Isolation rated "ec"}}$) |

Altitude range (≤ 4000 m)

| | |
|--------------|---------------------|
| Height range | > 3000 m ... 4000 m |
|--------------|---------------------|

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| | |
|--------------------------------------|--|
| 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 ($U_{\text{Isolation rated "ec"}}$) |
| 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 ($U_{\text{Isolation rated "ec"}}$) |

Approvals

CE

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

ATEX

| | |
|----------------|-------------------------------------|
| Identification | Ⓜ I (M1) [Ex ia Ma] I |
| | Ⓜ II (1) G [Ex ia Ga] IIC |
| | Ⓜ II (1) D [Ex ia Da] IIIC |
| | Ⓜ 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 |

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

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



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Approvals

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

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

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Classifications

ECLASS

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

ETIM

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

UNSPSC

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

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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) |
| SCIP | e2ad2e0c-4f1a-4eb0-915c-9cd1054fdbf0 |

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