

# MINI MCR-EX-SD-20-25-LP-PT - Solenoid driver



1157868

<https://www.phoenixcontact.com/us/products/1157868>

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Ex i-Solenoid driver for controlling Ex i solenoid valves in the Ex area. number of channels: 1, open-circuit voltage: 20 V DC, current limitation: 25 mA, Standard configuration, Loop-powered, 2-way isolation, Safety Integrity Level (SIL, IEC 61508): 3, Push-in connection

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1157868       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | C430          |
| Product key                          | DK1224        |
| GTIN                                 | 4063151163402 |
| Weight per piece (including packing) | 118.5 g       |
| Weight per piece (excluding packing) | 118.5 g       |
| Customs tariff number                | 85437090      |
| Country of origin                    | DE            |

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## Technical data

### Product properties

|                 |                 |
|-----------------|-----------------|
| Product type    | Solenoid driver |
| Product family  | MINI Analog Pro |
| No. of channels | 1               |

### Electrical properties

|   |                 |
|---|-----------------|
| Electrical isolation                          | 2-way isolation |
| Electrical isolation between input and output | yes             |

#### Electrical isolation

|                      |                     |
|----------------------|---------------------|
| Overvoltage category | II ( $\leq 5000$ m) |
| Pollution degree     | 2 ( $\leq 5000$ m)  |

#### Electrical isolation Input/output IEC/EN 61010-1

|                          |                              |
|--------------------------|------------------------------|
| Standards/regulations    | IEC/EN 61010-1               |
| Rated insulation voltage | 300 V <sub>rms</sub>         |
| Test voltage             | 2.5 kV AC (50 Hz, 60 s)      |
| Insulation               | Double/reinforced insulation |

#### Electrical isolation Input/output IEC/EN 60079-11

|                          |                      |
|--------------------------|----------------------|
| Standards/regulations    | IEC/EN 60079-11      |
| Rated insulation voltage | 265 V <sub>rms</sub> |

#### Electrical isolation Input/output IEC/EN 60079-7

|                          |                      |
|--------------------------|----------------------|
| Standards/regulations    | IEC/EN 60079-7       |
| Rated insulation voltage | 251 V <sub>rms</sub> |

### Supply

|                      |  |
|----------------------|--|
| Supply voltage range | loop-powered, no external supply necessary |
| Power consumption    | < 1 W                                      |

### Input data

#### Signal: Voltage

|                      |  |
|----------------------|--|
| Number of inputs     | 1  |
| Voltage input signal | 19.2 V DC ... 30 V DC (24 V DC, -20 % ... +25 %) |

### Output data

#### Signal: Voltage

|                    |   |
|--------------------|---|
| Number of outputs  | 1   |
| Output voltage     | $\geq 9.6$ V DC (25 mA)                                 |
| Output resistor    | $\geq 413 \Omega$ (Internal resistance R <sub>i</sub> ) |
| Current limitation | > 25 mA   |
| Response time      | < 50 ms   |

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|                      |           |
|----------------------|-----------|
| Open-circuit voltage | > 20 V DC |
| Short-circuit-proof  | yes       |

## Connection data

|                                  |  |
|----------------------------------|--|
| Connection method                | Push-in connection   |
| Stripping length                 | 10 mm  |
| Conductor cross-section rigid    | 0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> (with ferrule)<br>0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> (without ferrule) |
| Conductor cross-section flexible | 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>   |
| Conductor cross-section AWG      | 24 ... 12 (flexible)   |

## Ex data

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

## Safety data

|  |                                     |
|--|-------------------------------------|
| Max. internal inductance $L_i$   | negligible                          |
| Max. internal capacitance $C_i$  | 11 nF                               |
| Max. output voltage $U_o$  | 24 V                                |
| Max. output current $I_o$  | 59 mA                               |
| Max. output power $P_o$  | 354 mW                              |
| Safety-related maximum voltage $U_m$   | 253 V AC ( $\leq 2000$ m)           |
|  | 125 V DC ( $\leq 2000$ m)           |
|  | 121 V AC ( $> 2000$ m ... 3000 m)   |
|  | 110 V DC ( $> 2000$ m ... 3000 m)   |
|  | 33 V AC/DC ( $> 3000$ m ... 4000 m) |
|  | 33 V AC/DC ( $> 4000$ m ... 5000 m) |
| IIA (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$      | 70 mH / 3.33 $\mu$ F                |
| IIB/IIIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 30 mH / 919 nF                      |
| IIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$      | 10 mH / 114 nF                      |
| I (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$        | 90 mH / 5.23 $\mu$ F                |

## Dimensions

|        |           |
|--------|-----------|
| Width  | 6.2 mm    |
| Height | 109.81 mm |
| Depth  | 119.2 mm  |

## Material specifications

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|       |                 |
|-------|-----------------|
| Color | gray (RAL 7042) |
|-------|-----------------|

## Environmental and real-life conditions

### Ambient conditions

|   |                               |
|---|-------------------------------|
| Degree of protection                    | IP20                          |
| Ambient temperature (operation)         | -40 °C ... 70 °C              |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C              |
| Permissible humidity (operation)        | 5 % ... 95 % (non-condensing) |

### Altitude range (IEC/EN 61010-1)

|                                 |                                     |
|---------------------------------|-------------------------------------|
| Height range                    | > 2000 m ... 3000 m                 |
| Ambient temperature (operation) | -40 °C ... 63 °C                    |
| Rated insulation voltage        | 300 V <sub>rms</sub> (Input/output) |
| Insulation                      | Double/reinforced insulation        |

### Altitude range (IEC/EN 61010-1)

|                                 |                                     |
|---------------------------------|-------------------------------------|
| Height range                    | > 3000 m ... 4000 m                 |
| Ambient temperature (operation) | -40 °C ... 56 °C                    |
| Rated insulation voltage        | 300 V <sub>rms</sub> (Input/output) |
| Insulation                      | Double/reinforced insulation        |

### Altitude range (IEC/EN 61010-1)

|                                 |                                     |
|---------------------------------|-------------------------------------|
| Height range                    | > 4000 m ... 5000 m                 |
| Ambient temperature (operation) | -40 °C ... 49 °C                    |
| Rated insulation voltage        | 150 V <sub>rms</sub> (Input/output) |
| Insulation                      | Double/reinforced insulation        |

### Altitude range (IEC/EN 60079-11)

|                                 |                                     |
|---------------------------------|-------------------------------------|
| Height range                    | > 2000 m ... 3000 m                 |
| Ambient temperature (operation) | -40 °C ... 63 °C                    |
| Rated insulation voltage        | 150 V <sub>rms</sub> (Input/output) |

### Altitude range (IEC/EN 60079-11)

|                                 |                                    |
|---------------------------------|------------------------------------|
| Height range                    | > 3000 m ... 4000 m                |
| Ambient temperature (operation) | -40 °C ... 56 °C                   |
| Rated insulation voltage        | 60 V <sub>rms</sub> (Input/output) |

### Altitude range (IEC/EN 60079-11)

|                                 |                                    |
|---------------------------------|------------------------------------|
| Height range                    | > 4000 m ... 5000 m                |
| Ambient temperature (operation) | -40 °C ... 49 °C                   |
| Rated insulation voltage        | 60 V <sub>rms</sub> (Input/output) |

### Altitude range (IEC/EN 60079-7)

|                                 |                                     |
|---------------------------------|-------------------------------------|
| Height range                    | > 2000 m ... 3000 m                 |
| Ambient temperature (operation) | -40 °C ... 63 °C                    |
| Rated insulation voltage        | 162 V <sub>rms</sub> (Input/output) |

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## Altitude range (IEC/EN 60079-7)

|                                 |                                    |
|---------------------------------|------------------------------------|
| Height range                    | > 3000 m ... 4000 m                |
| Ambient temperature (operation) | -40 °C ... 56 °C                   |
| Rated insulation voltage        | 60 V <sub>rms</sub> (Input/output) |

## Altitude range (IEC/EN 60079-7)

|                                 |                                    |
|---------------------------------|------------------------------------|
| Height range                    | > 4000 m ... 5000 m                |
| Ambient temperature (operation) | -40 °C ... 49 °C                   |
| Rated insulation voltage        | 60 V <sub>rms</sub> (Input/output) |

## Approvals

### CE

|             |              |
|-------------|--------------|
| Certificate | CE-compliant |
|-------------|--------------|

### ATEX

|                |                                      |
|----------------|--------------------------------------|
| Identification | ⊕ 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 |
|                | ⊕ I (M1) [Ex ia Ma] I                |
| Certificate    | TÜV 21 ATEX 8651 X                   |

### IECEX

|                |                         |
|----------------|-------------------------|
| Identification | [Ex ia Ga] IIC          |
|                | [Ex ia Da] IIIC         |
|                | Ex ec [ia Ga] IIC T4 Gc |
|                | [Ex ia Ma] I            |
| Certificate    | IECEX TUR 21.0043 X     |

### CCC / China-Ex

|                |                         |
|----------------|-------------------------|
| Identification | [Ex ia Ga] IIC          |
|                | [Ex ia Da] IIIC         |
|                | Ex ec [ia Ga] IIC T4 Gc |
| Certificate    | 2023122310116238        |

### UL, USA/Canada

|                |   |
|----------------|---|
| Identification | UL 61010-2-201 Listed                                     |
|                | Class I, Div. 1, Groups A, B, C, D                        |
|                | Class II, Div. 1, Groups E, F, G                          |
|                | Class III, Div. 1   |
|                | Class I, Zone 0, 1, 2, Groups IIC, IIB, IIA               |
|                | Class I, Div. 2, Groups A, B, C, D T4                     |
|                | Class I, Zone 2   |
|                | AEx ec [ia Ga] IIC T4 Gc; AEx ec [ia IIIC Da] IIC T4 Gc   |
|                | Ex ec [ia Ga] IIC T4 Gc X; Ex ec [ia IIIC Da] IIC T4 Gc X |
|                | Class I, Zone 0, [AEx ia Ga] IIC, [Ex ia Ga] IIC X        |
|                |   |

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|             |   |
|-------------|---|
|             | Class I, Zone 20, [AEx ia Da] IIIC, [Ex ia Da] IIIC X |
| Certificate | ®. C.D.-No 097285872                                  |

## Shipbuilding approval

|             |                |
|-------------|----------------|
| Certificate | DNV TAA00003FZ |
|-------------|----------------|

## 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 23.0189 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 | Tested in accordance with the following standards and regulations: EN 61326-1 For industrial use, NAMUR NE 21 |
| Noise immunity                | IEC/EN 61000-6-2  |
| Noise immunity                | IEC/EN 61326-3-2  |

## Noise emission

|                       |                  |
|-----------------------|------------------|
| Standards/regulations | IEC/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 |

# MINI MCR-EX-SD-20-25-LP-PT - Solenoid driver

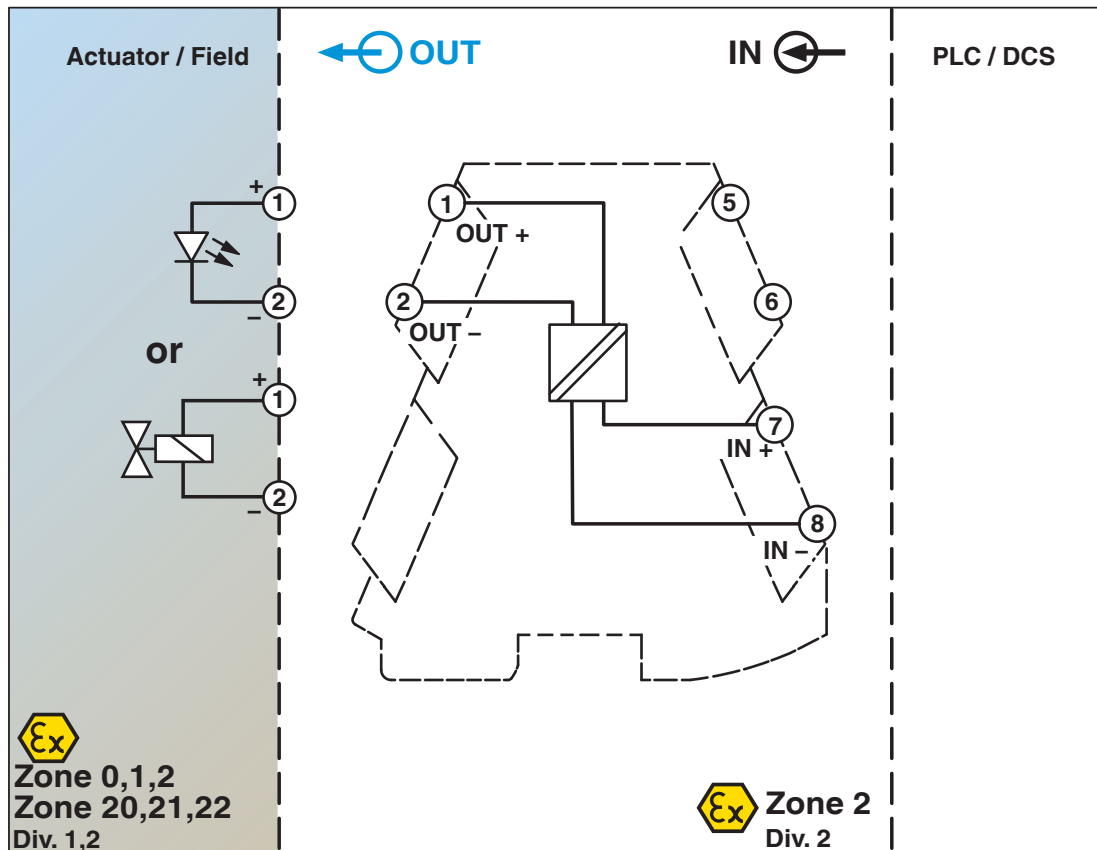


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## Drawings

Block diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1157868>



### Functional Safety

Approval ID: 1435.IM.131623/19



### cULus Listed

Approval ID: E238705

### DNV

Approval ID: TAA00003FZ



### cULus Listed

Approval ID: E238705



### IECEx

Approval ID: IECEx TUR 21.0043X



### ATEX

Approval ID: TUV 21 ATEX 8651 X



### CCC

Approval ID: 2023122316116237



### cULus Listed

Approval ID: E196811



### cULus Listed

Approval ID: E196811

### INMETRO

Approval ID: DNV 23.0189 X

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## Classifications

### ECLASS

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

### ETIM

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

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121008 |
|-------------|----------|

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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                                | 4130b180-30d6-4c5f-a9c0-c9ac7cd02a52 |

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