

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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

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 controlling Ex i solenoid valves in hazardous areas, logic input, off-load voltage 24.3 V, current limitation at 48 mA, line fault transparency, error message output, up to SIL 3 according to IEC 61508, Push-in connection.

## Your advantages

- Input: logic
- Output: intrinsically safe [Ex ia]; off-load voltage > 24.3 V DC; current limitation > 48 mA
- Line fault detection (can be enabled/disabled), via the signal circuit or via a separate error message output
- Transparent for test pulses
- Up to SIL 3 according to IEC/EN 61508
- Safe electrical isolation between output, input, supply, and error message output
- Power supply and error indication possible via DIN rail connector
- Plug-in connection terminals, push-in connection technology
- Installation in zone 2 permitted
- Housing width: 12.5 mm

## Commercial data

Item number	2906156
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DK1214
Product key	DK1214
Catalog page	Page 165 (C-5-2019)
GTIN	4055626040882
Weight per piece (including packing)	168.1 g
Weight per piece (excluding packing)	151.9 g
Customs tariff number	85437090
Country of origin	DE

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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

## Technical data

### Product properties

Product type	Solenoid driver
Product family	MACX Analog
Type	Ex i signal conditioners with SIL functional safety
Configuration	DIP switches

### Electrical properties

#### Electrical isolation

Overvoltage category	II
Pollution degree	2

#### Electrical isolation Output/input, error message output IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V <sub>PP</sub>
Test voltage	2.5 kV AC (50 Hz, 60 s)

#### Electrical isolation Output/input, error message 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	Safe isolation

#### Electrical isolation Output/supply, DIN rail connector IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V <sub>PP</sub>
Test voltage	2.5 kV AC (50 Hz, 60 s)

#### Electrical isolation Output/supply, DIN rail connector 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	Safe isolation

#### Electrical isolation Input/error message output/supply

Test voltage	1.5 kV AC (50 Hz, 60 s)
--------------	-------------------------

#### Supply

Nominal supply voltage	24 V DC -20 % ... +25 %
Supply voltage range	19.2 V DC ... 30 V DC
Power dissipation	< 1.62 W

### Input data

Signal: Logic

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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

Number of inputs	1
Switching level "0" signal	0 V DC ... 5 V DC (or open)
Switching level "1" signal	15 V DC ... 30 V DC
Input current	< 12 mA
Input impedance	3 MΩ (high-resistance in the event of a line fault at the output)
Immune to test pulses	Yes

## Output data

Signal: Error message output

Contact switching type	N/O contact
Type of output signal	Transistor output, passive
Maximum switching voltage	30 V DC
Max. switching current	50 mA
Short-circuit-proof	yes

Signal: Voltage

Output description	intrinsically safe
Number of outputs	1
Output voltage	≥ 9.7 V DC (48 mA)
Current limitation	> 48 mA (with line fault detection)
Response time	< 30 ms
Non-load voltage	> 24.3 V DC
Short-circuit-proof	yes
Line fault detection	> 10 kΩ (Line break) < 50 Ω (Short circuit) Activated /deactivated via DIP switch

## 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>
Conductor cross section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible (2 conductors with same cross section)	0.25 mm <sup>2</sup> ... 0.34 mm <sup>2</sup> (TWIN ferrule without plastic sleeve) 0.5 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> (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

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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

	Div. 1
Safety data	
Max. internal inductance $L_i$	negligible
Max. internal capacitance $C_i$	11 nF
Max. output voltage $U_o$	27.06 V
Max. output current $I_o$	91.11 mA
Max. output power $P_o$	616 mW
Maximum internal resistance $R_i$	297 $\Omega$
Safety-related maximum voltage $U_m$	253 V AC
	125 V DC
IIA/I (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	34.3 mH / 2.29 $\mu$ F
IIB/IIIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	17.1 mH / 0.686 $\mu$ F
IIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	4.3 mH / 0.078 $\mu$ F
IIA (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	20 mH / 0.47 $\mu$ F, 0.5 mH / 0.62 $\mu$ F, 0.2 mH / 0.8 $\mu$ F, 0.1 mH / 0.89 $\mu$ F
IIB/IIIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	5 mH / 189 nF, 2 mH / 289 nF, 0.15 mH / 489 nF
IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	1 mH / 39 nF, 0.5 mH / 59 nF, 0.15 mH / 89 nF

## Signaling

Status display	Green LED (supply voltage)
	LED yellow (switching state)
	Red LED (line errors)

## 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	V0 (Housing)
Housing material	PA 6.6-FR

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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20 (not assessed by UL)
Ambient temperature (operation)	-20 °C ... 60 °C (Any mounting position)
	-20 °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)	-20 °C ... 70 °C
Safety-related maximum voltage $U_m$	253 V AC
	125 V DC
Rated insulation voltage	375 V <sub>PP</sub>
	300 V AC/DC

### Altitude range (≤ 3000 m)

Height range	> 2000 m ... 3000 m
Ambient temperature (operation)	-20 °C ... 63 °C
Safety-related maximum voltage $U_m$	190 V AC
	110 V DC
Rated insulation voltage	190 V

### Altitude range (≤ 4000 m)

Height range	> 3000 m ... 4000 m
Ambient temperature (operation)	-20 °C ... 56 °C
Safety-related maximum voltage $U_m$	60 V AC/DC
Rated insulation voltage	60 V AC/DC

### Altitude range (≤ 5000 m)

Height range	> 4000 m ... 5000 m
Ambient temperature (operation)	-20 °C ... 49 °C
Safety-related maximum voltage $U_m$	60 V AC/DC
Rated insulation voltage	60 V AC/DC

## Approvals

### CE

Certificate	CE-compliant
Note	and EN 61326

### ATEX

Identification	⊕ I (M1) [Ex ia Ma] I
	⊕ II (1) G [Ex ia Ga] IIC

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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

	Ⓜ II (1) D [Ex ia Da] IIIC
	Ⓜ II 3(1) G Ex ec [ia Ga] IIC T4 Gc X
Certificate	IBExU 13 ATEX1045X

## IECEX

Identification	[Ex ia Ma] I
	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec [ia Ga] IIC T4 Gc
Certificate	IECEX IBE 13.0014X

## CCC / China-Ex

Identification	[Ex ia Ga] IIB
	[Ex ia Da] IIIC
	Ex ec [ia IIB Ga] IIC T4 Gc
Certificate	2022122316115979

## UL, USA/Canada

Identification	UL 61010 Listed
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 18.0145 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
Note	When being exposed to interference, there may be minimal deviations.

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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

## Noise emission

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

## Standards and regulations

### GB Standard

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

## Mounting

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

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

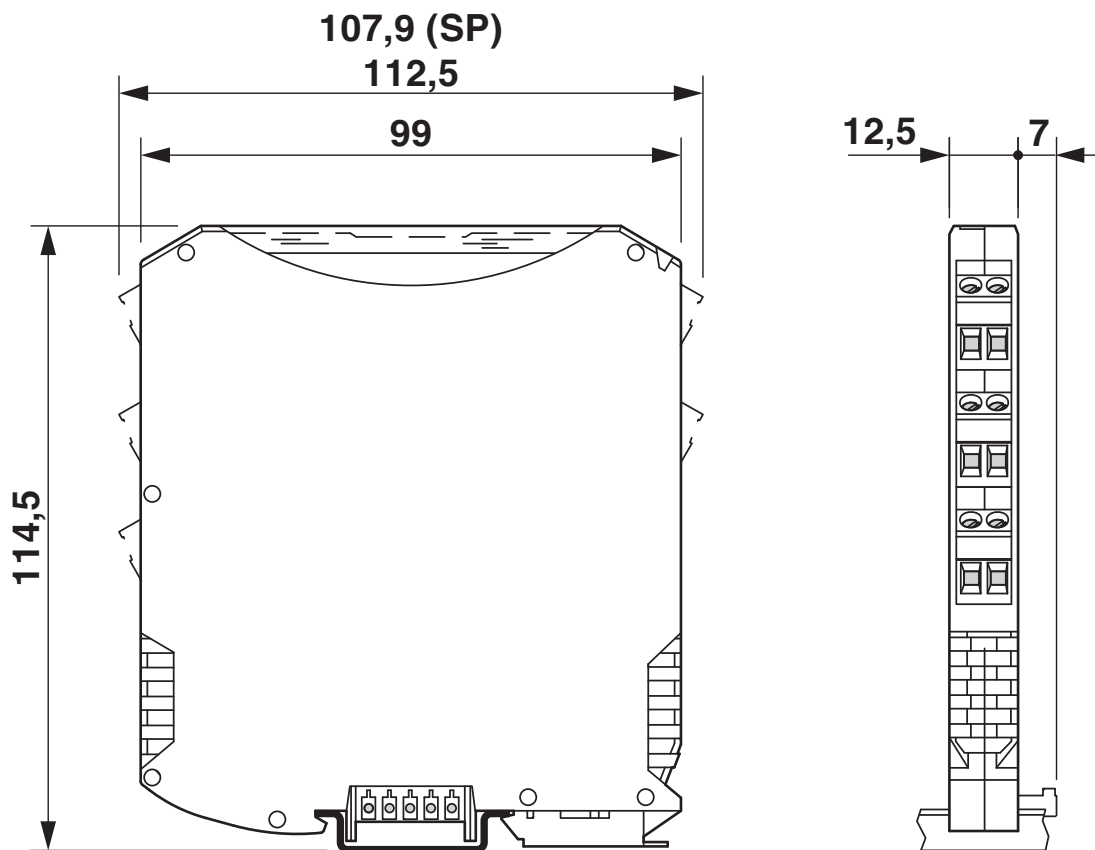


2906156

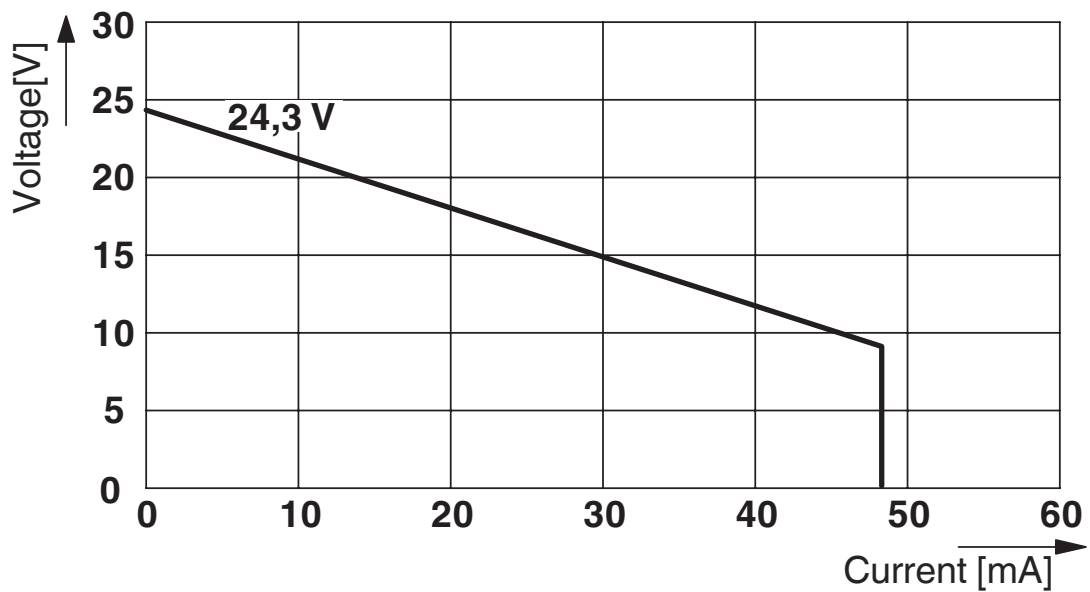
<https://www.phoenixcontact.com/au/products/2906156>

## Drawings

Dimensional drawing



Diagram





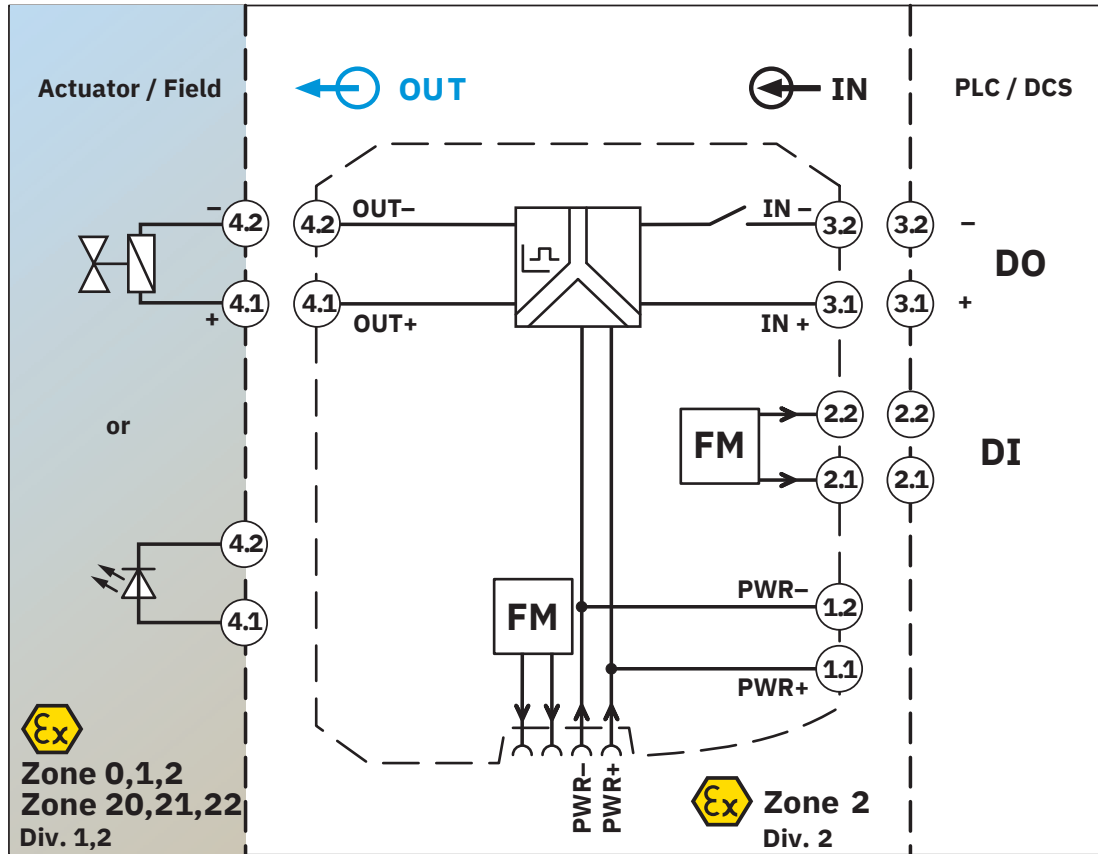
# MACX MCR-EX-SL-SD-24-48-LFD-SP - Solenoid driver



2906156

<https://www.phoenixcontact.com/au/products/2906156>

Block diagram



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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/au/products/2906156>



**CCC**

Approval ID: 2020322 316001582

### Functional Safety

Approval ID: BVS Pb 11/13

### DNV

Approval ID: TAA000020C



**ATEX**

Approval ID: IBExU13ATEX1045 X



**IECEx**

Approval ID: IECEX IBE 13.0014X

### INMETRO

Approval ID: DNV 18.0145 X

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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

## Classifications

### ECLASS

ECLASS-13.0

27210120

### ETIM

ETIM 9.0

EC002653

### UNSPSC

UNSPSC 21.0

39121000

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



2906156

<https://www.phoenixcontact.com/au/products/2906156>

## 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	273f1e59-9724-4c30-968f-0626581be3ba

Phoenix Contact 2025 © - all rights reserved  
<https://www.phoenixcontact.com>

PHOENIX CONTACT PTY Ltd  
Unit 7, 2-8 South Street  
Rydalmere NSW 2116  
1300 786 411  
[customerservice@phoenixcontact.com.au](mailto:customerservice@phoenixcontact.com.au)