MACX MCR-EX-SL-SD-21-25-LFD - Solenoid driver

2905669

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Ex i solenoid driver for controlling Ex i solenoid valves in hazardous areas, logic input, open-circuit voltage 21.1 V, current limitation at 25.1 mA, line fault transparency, fault monitoring output, up to SIL 3 according to IEC 61508; screw connection.

Your advantages

- Input: logic
- Output: intrinsically safe [Ex ia]; open-circuit voltage > 21.1 V DC; current limitation > 25.1 mA
- Line fault detection (can be enabled/disabled), via the signal circuit or via a separate fault monitoring output
- Transparent for test pulses
- Up to SIL 3 according to IEC/EN 61508
- Safe electrical isolation between output, input, supply, and fault monitoring output
- Power supply and error indication possible via DIN rail connector
- Plug-in connection terminals, screw connection technology
- Installation in zone 2 permitted
- Housing width: 12.5 mm

Commercial data

Item number	2905669
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C430
Product key	DK1214
GTIN	4046356985079
Weight per piece (including packing)	172.7 g
Weight per piece (excluding packing)	172.7 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
Configuration	DIP switches

Electrical properties

Electrical isolation between input and output	yes

Electrical isolation

Overvoltage category	II
Pollution degree	2

Electrical isolation Output/input, fault monitoring output IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V_{PP}
Test voltage	2.5 kV AC (50 Hz, 60 s)

Electrical isolation Output/input, fault monitoring output IEC/EN 61010-1

Standards/regulations	IEC/EN 61010-1
Rated insulation voltage	300 V_{rms}
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_{PP}
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_{rms}
Test voltage	2.5 kV AC (50 Hz, 60 s)
Insulation	Safe isolation

Electrical isolation Input/fault monitoring 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	< 0.8 W

Input data

Signal: Logic

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: Fault monitoring 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	≥ 4.64 V DC (25.1 mA)
Current limitation	> 25.1 mA (with line fault detection)
Response time	< 30 ms
Open-circuit voltage	> 21.1 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	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	2.3 mm

Ex data

Ex installation (EPL)	Gc
	Div. 2
	[Ga]

Ex i circuits (EPL)	[Da]
	[Ma]
	[Div. 1]

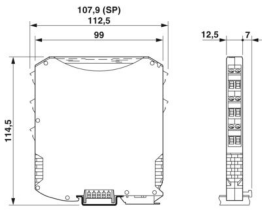
Safety data

Max. internal inductance L_i	negligible
Max. internal capacitance C_i	11 nF
Max. output voltage U_o	23.98 V
Max. output current I_o	37.4 mA
Max. output power P_o	224 mW
Maximum internal resistance R_i	641 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	203.4 mH / 3.33 µF
IIB/IIIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	101.7 mH / 0.91 µF
IIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	25.4 mH / 0.114 µF
IIA (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o	50 mH / 0.67 µF, 20 mH / 0.76 µF, 0.5 mH / 0.83 µF, 0.2 mH / 0.89 µF
IIB/IIIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o	5 mH / 289 nF, 1 mH / 489 nF
IIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o	5 mH / 59 nF, 0.5 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	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)	-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_{PP}
	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	Ⓔ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 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	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 18.0145 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.

Noise emission

Standards/regulations	EN 61000-6-4

Standards and regulations

GB Standard

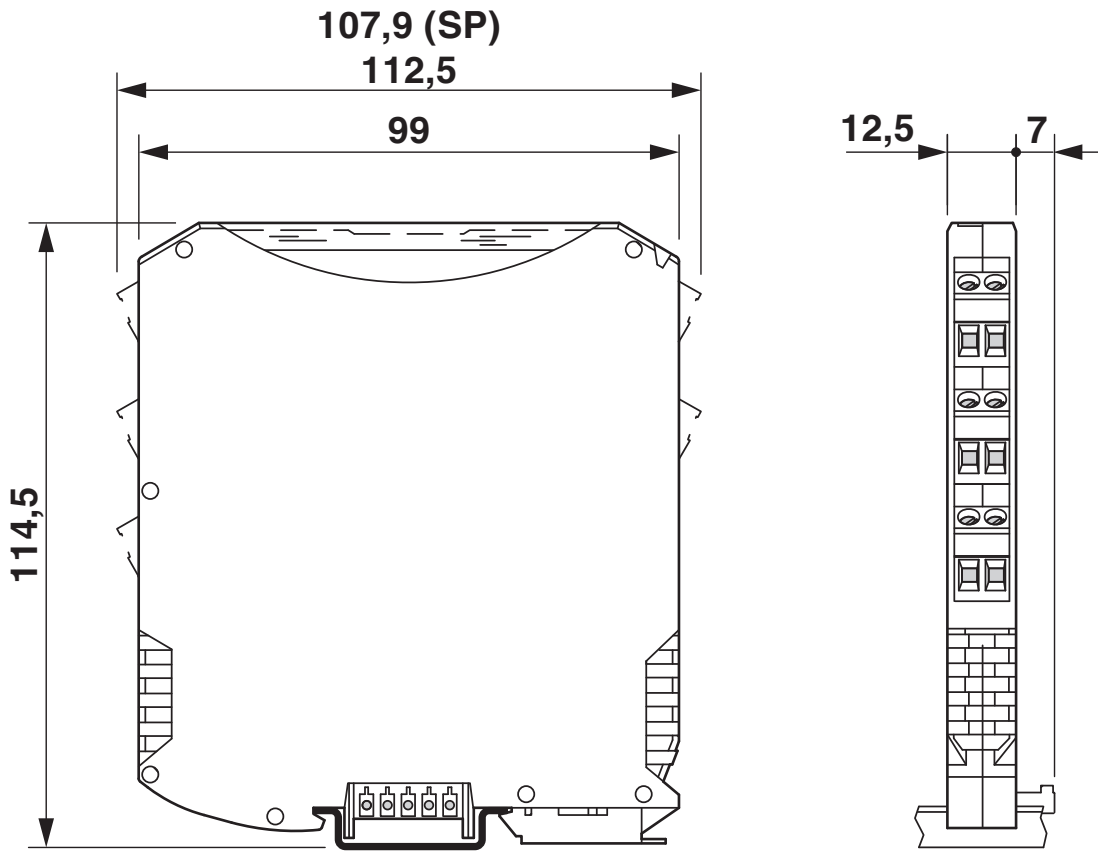
Standards/regulations	GB/T 3836.1
	GB/T 3836.3
	GB/T 3836.4

Mounting

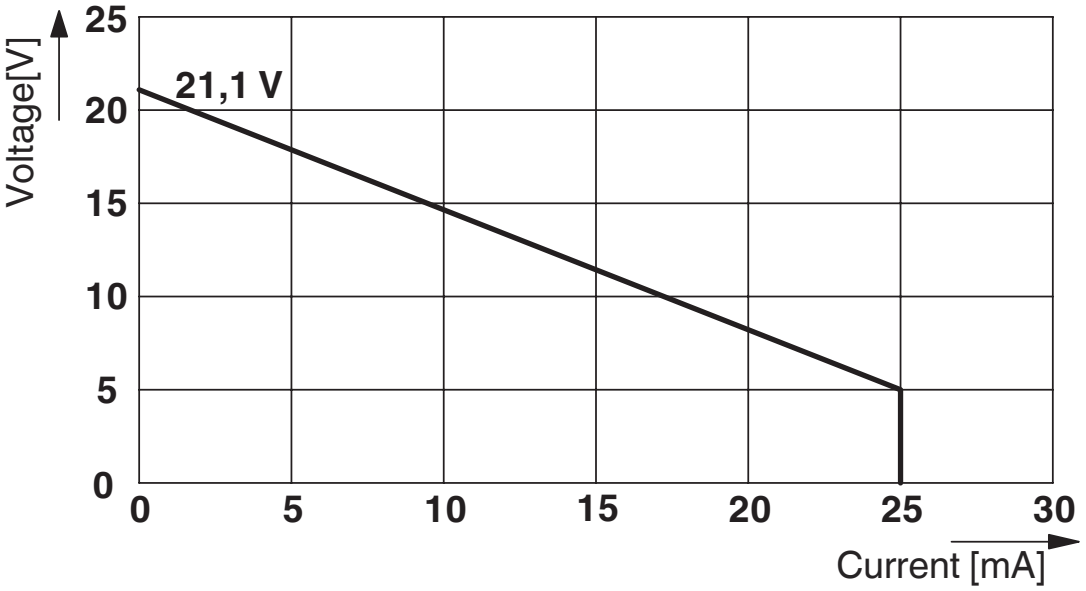
Mounting type	DIN rail mounting

Drawings

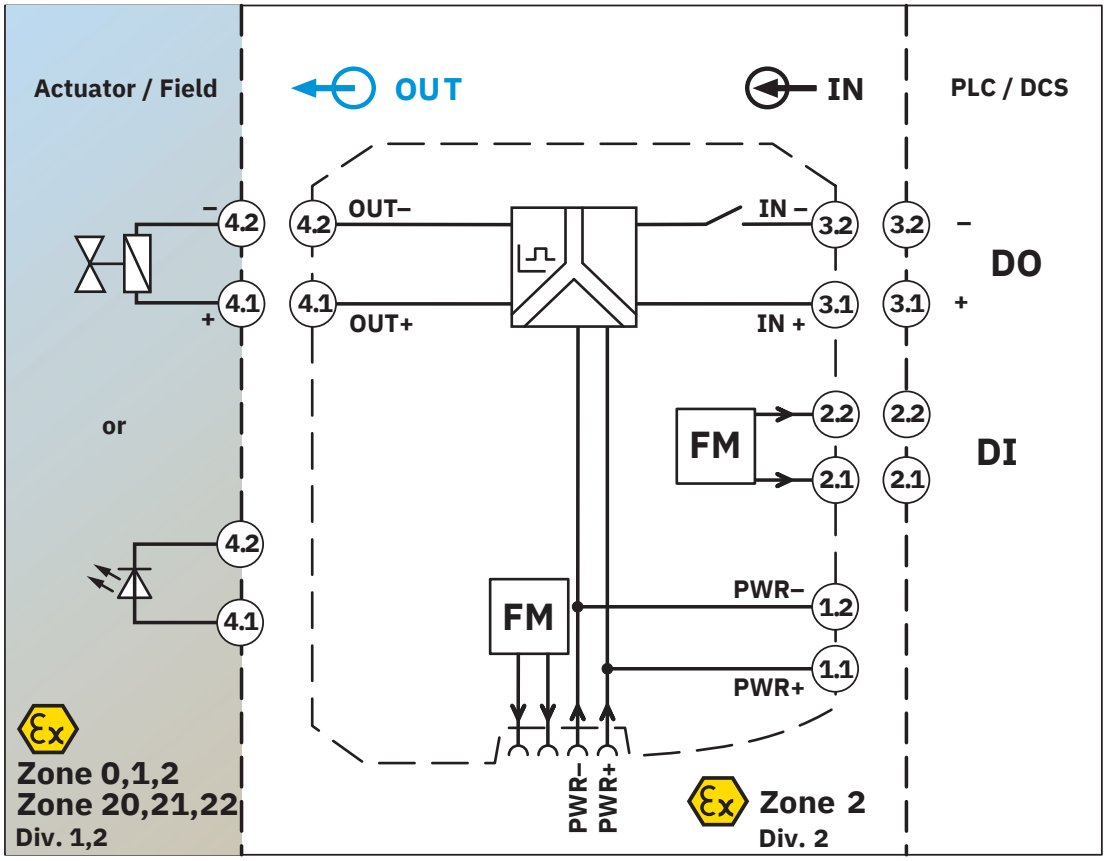
Dimensional drawing



Diagram



Block diagram



Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2905669

Functional Safety
Approval ID: BVS Pb 11/13

DNV
Approval ID: TAA000020C

IECEx
Approval ID: IECEX IBE 13.0014X

INMETRO
Approval ID: DNV 18.0145 X

CCC
Approval ID: 2022122316115979

ATEX
Approval ID: IBExU13ATEX1045 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	a948a40d-efe3-4a03-8371-77b0b5cc6942

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