

## Solenoid driver - MACX MCR-EX-SL-SD-21-60-LP - 2865515

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Ex i solenoid driver For controlling Ex i solenoid valves, alarm modules or LEDs installed in Ex areas. Current limitation at 58 mA. For gases up to Group II B, loop-powered, electrical isolation, SIL 3.

### Why buy this product

- 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 according to EN 61508
- 2-way electrical isolation
- 20  
30 V DC input
- Output [Ex ia] IIC/[Ex ia] IIB



### Key Commercial Data

Packing unit	1 pc
Weight per Piece (excluding packing)	165.6 GRM
Country of origin	Germany

### Technical data

#### Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
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#### Dimensions

Width	12.5 mm
Height	99 mm
Depth	114.5 mm

#### Ambient conditions

Ambient temperature (operation)	-20 °C ... 60 °C (Any mounting position)
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## Technical data

### Ambient conditions

Ambient temperature (storage/transport)	-40 °C ... 80 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Noise immunity	EN 61000-6-2
Degree of protection	IP20

### Output data

Output characteristic curve: Output resistor	133 Ω (Internal resistance R <sub>i</sub> )
Response time	30 ms

### Compatible valves

Note	This is an extract of possible combinations of valves and solenoid drivers.
Compatible valve	ASCO Coil 302 (12 V)
	ASCO Coil 302 (24 V)
	Bürkert Coil AC 10 standard
	Bürkert Coil AC 10 high resistance
	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
	Parker Coil VZ95 482160.01 EEx ia IIB T6

### Power supply

Power consumption	< 1.4 W
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### Connection data

Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	2.5 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>
Conductor cross section flexible max.	2.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	14
Stripping length	7 mm
Screw thread	M3
Connection method	Screw connection
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

### General

No. of channels	1
Maximum temperature coefficient	0.01 %/K

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## Technical data

### General

Status display	Yellow LED (switching state / status, lights up when output circuit is active)
Flammability rating according to UL 94	V0
Degree of pollution	2
Overvoltage category	II
Electromagnetic compatibility	Conformance with EMC directive
Emitted interference	EN 61000-6-4
Housing material	PA 66-FR
Color	green
Designation	Output/input
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
	300 V <sub>rms</sub> (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
	2.5 kV (50 Hz, 1 min., test voltage)
Conformance	CE-compliant, additionally EN 61326
ATEX	# II 3 G Ex nA IIC T4 Gc X
	# II (1) G [Ex ia Ga] IIB/IIA
	# II (1) D [Ex ia Da] IIIC
IECEX	[Ex ia Ga] IIB/IIA
	[Ex ia Da] IIIC
	Ex nA IIC T4 Gc X
UL, USA / Canada	Class I Div 2; IS for Class I, II, III Div 1
Functional Safety (SIL)	SIL 3

### Safety characteristic data

Integrity requirement	IEC 61508 - Low demand
Equipment type	Type A
Safety Integrity Level (SIL)	3
Safe Failure Fraction (SFF)	100 %
$\lambda_{SU}$	$2.84 \times 10^{-7}$ (284 FIT)
$\lambda_{SD}$	0
$\lambda_{DU}$	0
$\lambda_{DD}$	0
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	0 (1 year)
	0 (5 years)
	0 (10 years)
Diagnostic coverage (DC)	DC <sub>S</sub> = 0%, DC <sub>D</sub> = 0%

### Safety data

Input power P <sub>i</sub>	negligible
Max. internal inductance L <sub>i</sub>	negligible
Max. internal capacitance C <sub>i</sub>	negligible

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## Technical data

### Safety data

Max. output voltage $U_o$	25.1 V
Max. output current $I_o$	188 mA
Max. output power $P_o$	1.18 W
Group	IIB
Max. external inductivity $L_o$	7 mH
Max. external capacity $C_o$	0.8 $\mu$ F
Group	IIA
Max. external inductivity $L_o$	14.6 mH
Max. external capacity $C_o$	2.9 $\mu$ F
Safety-related maximum voltage $U_m$	253 V AC (125 V DC)

### Standards and Regulations

Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4
Flammability rating according to UL 94	V0
Conformance	CE-compliant, additionally EN 61326
ATEX	# II 3 G Ex nA IIC T4 Gc X
	# II (1) G [Ex ia Ga] IIB/IIA
	# II (1) D [Ex ia Da] IIIC
IECEX	[Ex ia Ga] IIB/IIA
	[Ex ia Da] IIIC
	Ex nA IIC T4 Gc X
UL, USA / Canada	Class I Div 2; IS for Class I, II, III Div 1
Group	IIB
	IIA

## Classifications

### eCl@ss

eCl@ss 4.0	27210121
eCl@ss 4.1	27210121
eCl@ss 5.0	27210121
eCl@ss 5.1	27210121
eCl@ss 6.0	27210121
eCl@ss 7.0	27210121
eCl@ss 8.0	27210120
eCl@ss 9.0	27210120

### ETIM

ETIM 2.0	EC001430
ETIM 3.0	EC001599

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## Classifications

### ETIM

ETIM 4.0	EC001599
ETIM 5.0	EC002653

### UNSPSC

UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	39121008

## Approvals

### Approvals

#### Approvals

UL Listed / cUL Listed / Functional Safety / EAC / cULus Listed

#### Ex Approvals

IECEX / UL Listed / cUL Listed / ATEX / IECEX / ATEX / EAC Ex / IECEX / cULus Listed

#### Approvals submitted

### Approval details

UL Listed

cUL Listed

Functional Safety

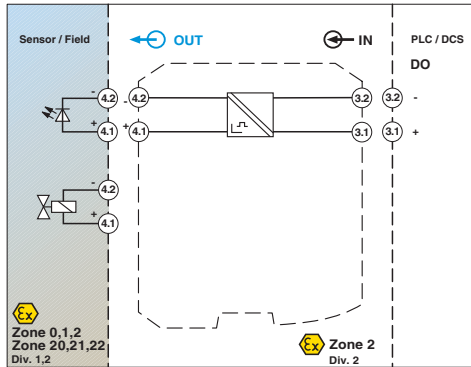
EAC

cULus Listed

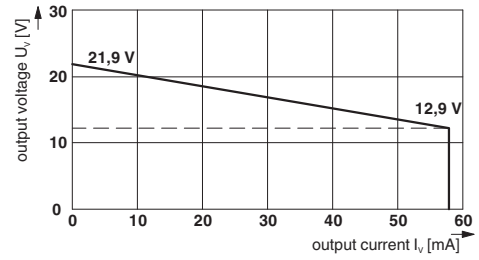
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## Drawings

Block diagram



Diagram



Dimensional drawing

