

# Solenoid driver - MACX MCR-EX-SL-SD-24-48-LP-SP - 2924126

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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 48 mA. For gases up to Group II C, loop-powered, electrical isolation, SIL 3.

The illustration shows the versions with screw connection

## Product Features

- 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 according to EN 61508
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- 20  
30 V DC input
- 2-way electrical isolation
- Output [Ex ia] IIC/[Ex ia] IIB



## Key commercial data

<b>package_quantity</b>	1
<b>GTIN</b>	4046356338486

## Technical data

### Dimensions

<b>Width</b>	12.5 mm
<b>Height</b>	99 mm
<b>Depth</b>	114.5 mm

### Ambient conditions

<b>Ambient temperature (operation)</b>	-20 °C ... 60 °C (Any mounting position)
<b>Ambient temperature (storage/transport)</b>	-40 °C ... 80 °C
<b>Maximum altitude</b>	≤ 2000 m
<b>Permissible humidity (operation)</b>	10 % ... 95 % (no condensation)
<b>Degree of protection</b>	IP20

### Output data

<b>Minimum output voltage</b>	10.5 V DC (At 48 mA)
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## Technical data

### Output data

<b>Output characteristic curve: Output resistor</b>	276 Ω (Internal resistance R <sub>i</sub> )
<b>Response time</b>	30 ms

### Compatible valves

<b>Note</b>	This is an extract of possible combinations of valves and solenoid drivers.
<b>Compatible valve</b>	ASCO Coil 195
<b>Compatible valve</b>	ASCO Coil 302 (12 V)
<b>Compatible valve</b>	Bürkert Coil AC 10 standard
<b>Compatible valve</b>	Bürkert Coil AC 10 high resistance
<b>Compatible valve</b>	Bürkert Coil AC 21 standard 700 mW / 65°C
<b>Compatible valve</b>	Bürkert Coil AC 21 high resistance 700 mW / 65°C
<b>Compatible valve</b>	Bürkert Coil AC 21 standard 900 mW / 45°C
<b>Compatible valve</b>	Bürkert Coil AC 21 high resistance 900 mW / 45°C
<b>Compatible valve</b>	Bürkert Coil AC 21 standard 900 mW / 60°C
<b>Compatible valve</b>	Bürkert Coil AC 21 high resistance 900 mW / 60°C
<b>Compatible valve</b>	Bürkert Coil G1 642735 standard 800 mW / 40°C
<b>Compatible valve</b>	Bürkert Coil G1 642735 high resistance 800 mW / 40°C
<b>Compatible valve</b>	Bürkert Coil G1 642735 standard 1000 mW / 40°C
<b>Compatible valve</b>	Bürkert Coil G1 642735 high resistance 1000 mW / 40°C
<b>Compatible valve</b>	FESTO Coil MFH-...IA-SA-EX GBXE022AIAD03
<b>Compatible valve</b>	FESTO Coil (J)MFH-...BIA-SA-EX GBXE022AIAD03
<b>Compatible valve</b>	Norgren Herion Coil 2050
<b>Compatible valve</b>	Norgren Herion Coil 2051
<b>Compatible valve</b>	Norgren Herion Coil 2052
<b>Compatible valve</b>	Norgren Herion Coil 2053
<b>Compatible valve</b>	Norgren Herion Coil 2080 / 2082
<b>Compatible valve</b>	Norgren Herion Coil 2081 / 2083
<b>Compatible valve</b>	Norgren Herion Coil 2084
<b>Compatible valve</b>	Norgren Herion Coil 3039
<b>Compatible valve</b>	Nass Coil 1259 30.1-00
<b>Compatible valve</b>	Nass Coil 1259 50.1-00
<b>Compatible valve</b>	Parker Coil VZ07 488650.01
<b>Compatible valve</b>	Parker Coil VZ33 494035.10
<b>Compatible valve</b>	Parker Coil VZ08 488660.01
<b>Compatible valve</b>	Parker Coil VZ09 488670.01
<b>Compatible valve</b>	Parker Coil VZ95 482160.01 EEx ia IIB T6
<b>Compatible valve</b>	Parker Coil VZ23 482870.01
<b>Compatible valve</b>	Samson Coil 3701-12 (12 V)
<b>Compatible valve</b>	Samson Coil 3701-13 (24 V)
<b>Compatible valve</b>	Samson Coil 3963-12 (12 V)
<b>Compatible valve</b>	Samson Coil 3963-13 (24 V)

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## Technical data

### Compatible valves

Compatible valve	Samson Coil 3964-12 (12 V)
Compatible valve	Samson Coil 3964-13 (24 V)
Compatible valve	Seitz Pilot valve PV 12F73 Ci oH
Compatible valve	Seitz Pilot valve PV 12F73 Xi oH
Compatible valve	Seitz Pilot valve PV 12F73 Xi oH-2
Compatible valve	Seitz Solenoid coil 11 G 52

### 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.	1.5 mm <sup>2</sup>
Conductor cross section stranded min.	0.2 mm <sup>2</sup>
Conductor cross section stranded max.	1.5 mm <sup>2</sup>
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max	16
Stripping length	8 mm
Connection method	Spring-cage conn.

### General

No. of channels	1
Maximum temperature coefficient	0.01 %/K
Status display	Yellow LED (switching state / status, lights up when output circuit is active)
Inflammability class according to UL 94	V0
Pollution degree	2
Surge voltage category	II
Housing material	PA 66-FR
Color	green
Name	Output/input
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
Electrical isolation	300 V <sub>rms</sub> (Rated insulation voltage (surge voltage category II; pollution degree 2, safe isolation as per EN 61010-1))
Electrical isolation	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
ATEX	# II (1) G [Ex ia Ga] IIC/IIB/IIA
ATEX	# II (1) D [Ex ia Da] IIIC
IECEX	[Ex ia Ga] IIC/IIB/IIA
IECEX	[Ex ia Da] IIIC
IECEX	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

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## Technical data

### 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)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	0 (5 years)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	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 capacitance C <sub>i</sub>	(negligible)
Max. output voltage U <sub>o</sub>	27.7 V
Max. output current I <sub>o</sub>	101 mA
Max. output power P <sub>o</sub>	697 mW
Gas group	IIC
Max. external inductivity L <sub>o</sub>	5.2 mH
Max. external capacity C <sub>o</sub>	0.08 µF
Gas group	IIB
Max. external inductivity L <sub>o</sub>	20 mH
Max. external capacity C <sub>o</sub>	0.66 µF
Gas group	IIA
Max. external inductivity L <sub>o</sub>	42 mH
Max. external capacity C <sub>o</sub>	2.2 µF
Safety-related maximum voltage U <sub>m</sub>	253 V AC (125 V DC)

## 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	27210121

### ETIM

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## classifications

### ETIM

ETIM 2.0	EC001430
ETIM 3.0	EC001599
ETIM 4.0	EC001599
ETIM 5.0	EC001599

### UNSPSC

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

## approvals

IECEX / UL Listed / cUL Listed / ATEX / IECEx / ATEX / cULus Listed / UL Listed / cUL Listed / Functional Safety / cULus Listed /

### Approval details

IECEX

UL Listed

cUL Listed

ATEX

cULus Listed

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approvals



Functional Safety



Drawings

Block diagram

