

# Solenoid Driver

## HiD2872



- 2-channel isolated barrier
- 24 V DC supply (bus or loop powered)
- Output 40 mA at 12 V DC, 55 mA current limit
- Contact or logic control input
- Entity parameter  $I_0/I_{SC} = 110$  mA
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC 61508 (bus powered)
- Up to SIL 3 acc. to IEC 61508 (loop powered)



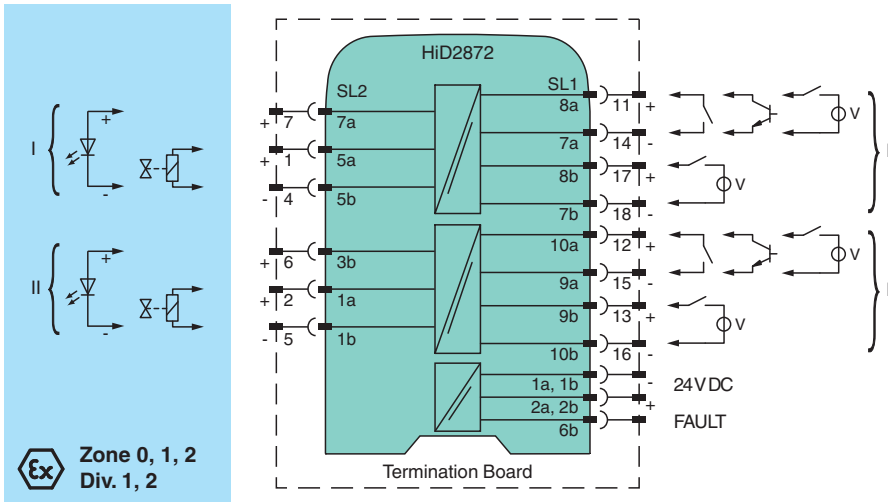
SIL 3



### Function

This isolated barrier is used for intrinsic safety applications. It supplies power to solenoids, LEDs, and audible alarms, located in a hazardous area. It is controlled with a loop-powered control signal, switch contact, transistor, or logic signal. At full load, 12 V at 40 mA (with 55 mA current limit) is available for the hazardous area application. An alternative low current output is available for driving a single LED without installing an external current limiting resistor. Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. This device mounts on a HiD Termination Board.

### Connection



**Ex** Zone 0, 1, 2  
Div. 1, 2

### Technical Data

#### General specifications

Signal type Digital Output

#### Functional safety related parameters

Safety Integrity Level (SIL) SIL 3

#### Supply

Connection SL1: 1a(-), 1b(-); 2a(+), 2b(+)

Rated voltage  $U_r$  20.4 ... 30 V DC loop powered  
20.4 ... 30 V DC bus powered via Termination Board

Input current 62 mA at 24 V, 300  $\Omega$  load (per channel)

Power dissipation 1 W at 24 V, 300  $\Omega$  load (per channel)

Release date: 2021-08-05 Date of issue: 2021-08-05 Filename: 278766\_eng.pdf

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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## Technical Data

Input	
Connection side	control side
Connection	SL1: 8a(+), 7a(-); 10a(+), 9a(-) bus powered SL1: 8b(+), 7b(-); 9b(+), 10b(-) loop powered
Control input	external switch (dry contact or open collector) non isolated or logic signal input fully floating
Signal level	1-signal: 15...30 V DC (current limited at 3 mA) or contact close (internal 10 kΩ pull-up) 0-signal: 0...5 V DC or contact open
Power dissipation	1 W at 24 V, 300 Ω load (per channel) for loop powered
Inrush current	0.2 A , 15 ms loop powered
Output	
Connection side	field side
Connection	SL2: 5a(+), 5b(-), 7a(+); 1a(+), 1b(-), 3b(+)
Internal resistor	R <sub>i</sub> approx. 240 Ω
Current	I <sub>e</sub> ≤ 40 mA
Voltage	U <sub>e</sub> ≥ 12 V
Current limit	I <sub>max</sub> 55 mA
Open loop voltage	U <sub>s</sub> approx. 22.5 V
Load	nominal 0.1 ... 5 kΩ
Switching frequency	f - bus powered: filter OFF: max. 150 Hz, filter ON: max. 15 Hz - loop powered: max. 10 Hz
Energized/De-energized delay	- bus powered: filter OFF: 1 ms, filter ON: 10 ms - loop powered: switch-on 50 ms, switch-off 6 ms (300 Ω load)
Fault indication output	
Connection	SL1: 6b
Output type	open collector transistor (internal fault bus)
Fault current	4 mA pulsing (20 ms ON, 200 ms OFF)
Fault level	lead short-circuit detection at < 25 Ω lead breakage detection at > 100 kΩ typical
Galvanic isolation	
Output/Output	safe electrical isolation acc. to EN 60079-11: 2007, voltage peak value 60 V
Output/power supply, inputs, and collective error	safe electrical isolation acc. to EN 60079-11: 2007, voltage peak value 375 V
Indicators/settings	
Display elements	LEDs
Control elements	DIP-switch
Configuration	via DIP switches
Labeling	space for labeling at the front
Directive conformity	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)
Conformity	
Electromagnetic compatibility	NE 21:2006 For further information see system description.
Degree of protection	IEC 60529:2001
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Relative humidity	5 ... 90 %, non-condensing up to 35 °C (95 °F)
Mechanical specifications	
Degree of protection	IP20
Mass	approx. 140 g
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 inch)
Mounting	on Termination Board
Coding	pin 1 and 4 trimmed For further information see system description.
Data for application in connection with hazardous areas	

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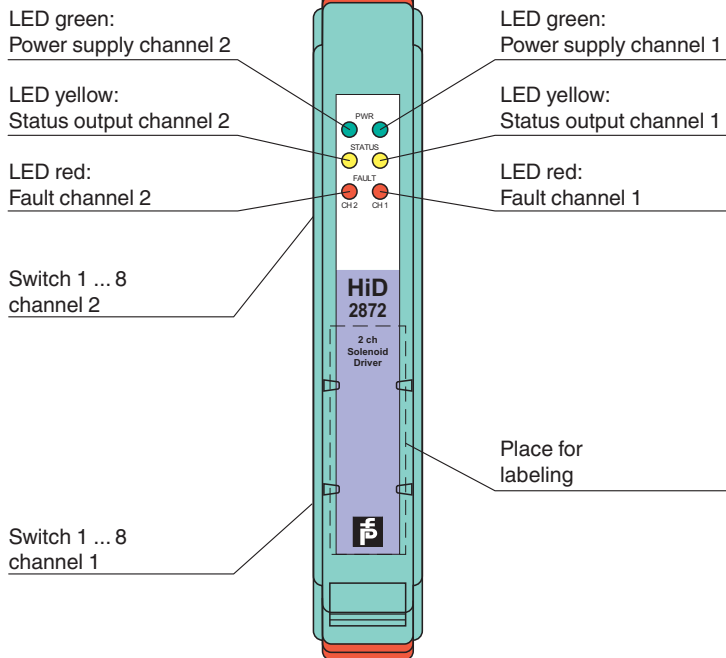
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**Technical Data**

EU-type examination certificate		CESI 10 ATEX 036
Marking		⊕ II (1)G [Ex ia Ga] IIC ⊕ II (1)D [Ex ia Da] IIIC ⊕ I (M1) [Ex ia Ma] I
Output		Ex ia Ga, Ex ia Da, Ex ia Ma
Voltage	U <sub>o</sub>	26 V
Current	I <sub>o</sub>	110 mA
Power	P <sub>o</sub>	715 mW
Supply		
Maximum safe voltage	U <sub>m</sub>	253 V AC (Attention! U <sub>m</sub> is no rated voltage.)
Certificate		PF 10 CERT 1729 X
Marking		⊕ II 3G Ex nA IIC T4 Gc
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-15:2010
<b>International approvals</b>		
CSA approval		
Control drawing		366-005CS-12B (cCSAus)
IECEX approval		
IECEX certificate		IECEX CES 10.0013
IECEX marking		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
<b>General information</b>		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

**Assembly**

**Front view**



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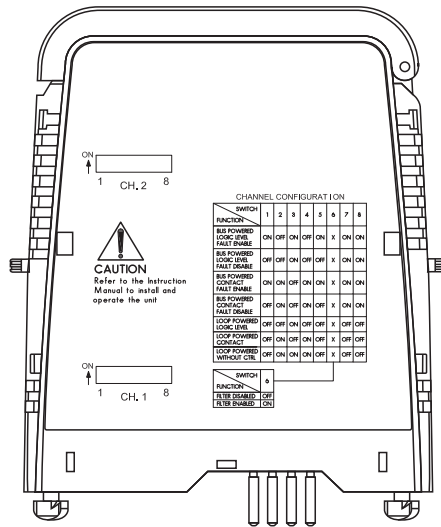
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## Configuration



### Switch settings

Switches for channel I and II	S1	S2	S3	S4	S5	S6	S7	S8
<b>Function</b>								
<ul style="list-style-type: none"> <li>• Bus powered</li> <li>• Control input: logic signal</li> <li>• Line fault detection enabled</li> </ul>	ON	OFF	ON	OFF	ON	X	ON	ON
<ul style="list-style-type: none"> <li>• Bus powered</li> <li>• Control input: logic signal</li> <li>• Line fault detection disabled</li> </ul>	OFF	OFF	ON	OFF	OFF	X	ON	ON
<ul style="list-style-type: none"> <li>• Bus powered</li> <li>• Control input: contact</li> <li>• Line fault detection enabled</li> </ul>	ON	ON	OFF	ON	ON	X	ON	ON
<ul style="list-style-type: none"> <li>• Bus powered</li> <li>• Control input: contact</li> <li>• Line fault detection disabled</li> </ul>	OFF	ON	OFF	ON	OFF	X	ON	ON
<ul style="list-style-type: none"> <li>• Loop powered</li> <li>• Control input: logic signal</li> <li>• Line fault detection disabled</li> </ul>	OFF	OFF	ON	OFF	OFF	X	OFF	OFF
<ul style="list-style-type: none"> <li>• Loop powered</li> <li>• Control input: contact</li> <li>• Line fault detection disabled</li> </ul>	OFF	ON	OFF	ON	OFF	X	OFF	OFF
<ul style="list-style-type: none"> <li>• Loop powered</li> <li>• Control input: without control</li> <li>• Line fault detection disabled</li> </ul>	OFF	ON	ON	ON	OFF	X	OFF	OFF
<b>Switches for channel I and II</b>	<b>S6</b>							
<b>Function</b>								
Filter disable	OFF							
Filter enable	ON							

Factory setting: bus powered, control input: contact, line fault detection enabled, filter disabled



To reduce the power consumption of the device, we recommend to set the DIP switches of channel II in the OFF condition, when channel II is not used (single channel application).

## Configuration

The new device HiD2872 will replace the devices HiD2871, HiD2872, HiD2873 and HiD2874. The new device HiD2872 has the same device functions as the four previous devices. If you want to use the specific device functions of the previous devices, you must configure the new device HiD2872. See following table.

Previous device	New device

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

HiD2871, part number 121464 HiD2872, part number 121471				HiD2872, part number 204846									
Settings	S1	S2	S3	Settings	S1	S2	S3	S4	S5	S6	S7	S8	
Bus powered with control	OFF	ON	ON	<ul style="list-style-type: none"> <li>Bus powered</li> <li>Control input: contact</li> <li>Line fault detection disable</li> </ul>	OFF	ON	OFF	ON	OFF	X	ON	ON	
Loop powered	ON	OFF	OFF	<ul style="list-style-type: none"> <li>Loop powered</li> <li>Control input: without control</li> </ul>	OFF	ON	ON	ON	OFF	X	OFF	OFF	
Loop powered with control	OFF	OFF	OFF										
HiD2873, part number 121502 HiD2874, part number 121505				HiD2872, part number 204846									
Settings	S1	S2	S3	Settings	S1	S2	S3	S4	S5	S6	S7	S8	
Contact or open collector	OFF	ON	ON	<ul style="list-style-type: none"> <li>Bus powered</li> <li>Control input: contact</li> <li>Line fault detection disable</li> </ul>	OFF	ON	OFF	ON	OFF	X	ON	ON	
Logic input	ON	OFF	OFF	<ul style="list-style-type: none"> <li>Bus powered</li> <li>Control input: logic signal</li> <li>Line fault detection disable</li> </ul>	OFF	OFF	ON	OFF	OFF	X	ON	ON	

## Configuration

Configure the device in the following way:

- Push the red Quick Lok Bars on each side of the device in the upper position.
- Remove the device from Termination Board.
- Set the DIP switches according to the figure.



The pins for this device are trimmed to polarize it according to its safety parameter. Do not change! For further information see system description.

## Installation Conditions

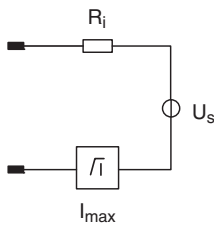


When both channels of the solenoid driver are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl+Fuchs for guidance.

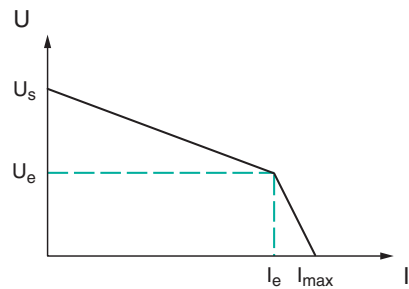
## Characteristic Curve

### Output characteristics

Output circuit diagram



Output characteristic



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