

Solenoid Driver

HiD2876



- 2-channel isolated barrier
- 24 V DC supply (bus or loop powered)
- Output 40 mA at 11.2 V DC, 55 mA current limit
- Contact or logic control input
- Entity parameter $I_o/I_{sc} = 93$ mA
- Line fault detection (LFD)
- Up to SIL 3 acc. to IEC/EN 61508 (loop powered)



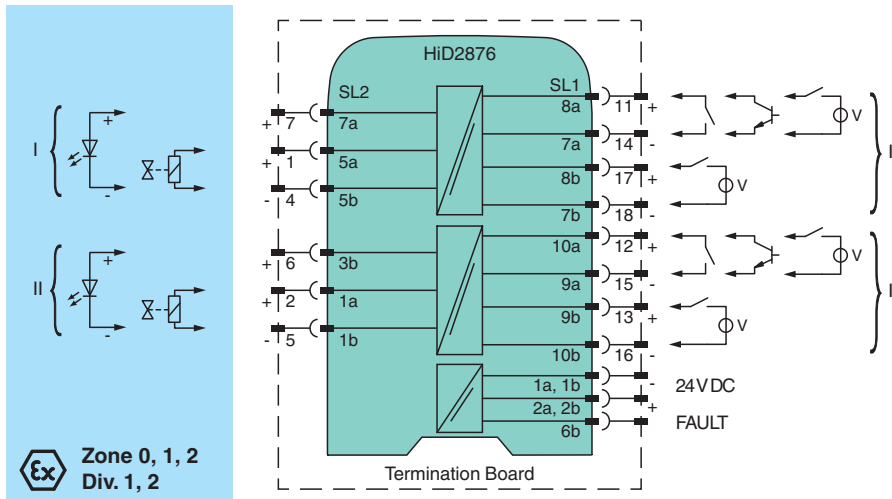
Function

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, 11.2 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.

Application

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.

Connection



Technical Data

General specifications	
Signal type	Digital Output
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 3
Systematic capability (SC)	SC 3
Supply	

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

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Technical Data

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 Ω load (per channel)
Power dissipation		1 W at 24 V, 300 Ω load (per channel)
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 k Ω 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_i	approx. 280 Ω
Current	I_e	\leq 40 mA
Voltage	U_e	\geq 11.2 V
Current limit	I_{max}	55 mA
Open loop voltage	U_s	approx. 22.5 V
Load		nominal 0.1 ... 5 k Ω
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 k Ω 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 $^{\circ}$ C (-4 ... 140 $^{\circ}$ F)
Relative humidity		5 ... 90 %, non-condensing up to 35 $^{\circ}$ C (95 $^{\circ}$ F)
Mechanical specifications		
Degree of protection		IP20
Mass		approx. 140 g

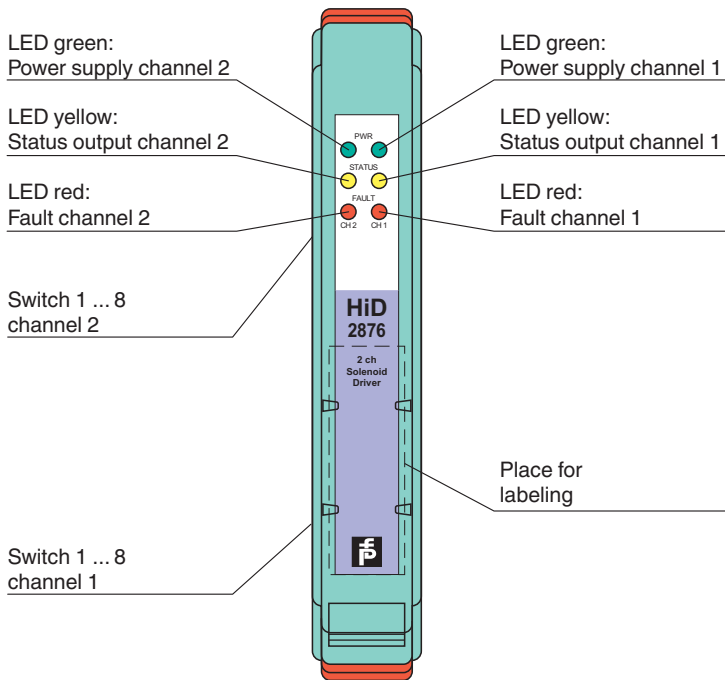
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Technical Data

Dimensions	18 x 114 x 130 mm (0.7 x 4.5 x 5.1 inch) (W x H x D)	
Mounting	on termination board	
Coding	pin 1 and 3 trimmed For further information see system description.	
Data for application in connection with hazardous areas		
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 _o	26 V
Current	I _o	93 mA
Power	P _o	605 mW
Supply		
Maximum safe voltage	U _m	253 V AC (Attention! U _m 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	
International approvals		
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	
General information		
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com .	

Assembly

Front view



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Configuration

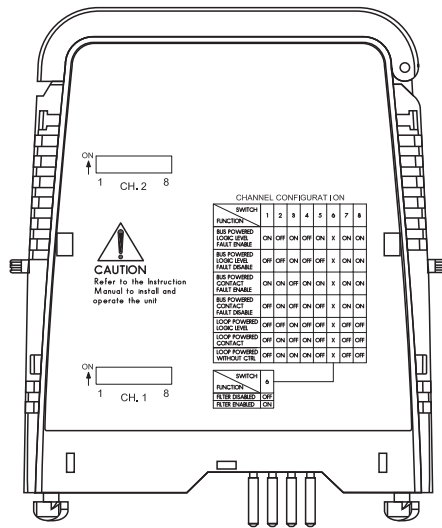
Configure the device in the following way:

- Push the red Quick Lok Bars on each side of the device in the upper position.
- Remove the device from termination board.
- Set the switches according to the figure in the **Configuration** section.

Note

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

Configuration



Switch settings

Switches for channel I and II	S1	S2	S3	S4	S5	S6	S7	S8
Function								
• Bus powered • Control input: logic signal • Line fault detection enabled	ON	OFF	ON	OFF	ON	X	ON	ON
• Bus powered • Control input: logic signal • Line fault detection disabled	OFF	OFF	ON	OFF	OFF	X	ON	ON
• Bus powered • Control input: contact • Line fault detection enabled	ON	ON	OFF	ON	ON	X	ON	ON
• Bus powered • Control input: contact • Line fault detection disabled	OFF	ON	OFF	ON	OFF	X	ON	ON
• Loop powered • Control input: logic signal • Line fault detection disabled	OFF	OFF	ON	OFF	OFF	X	OFF	OFF
• Loop powered • Control input: contact • Line fault detection disabled	OFF	ON	OFF	ON	OFF	X	OFF	OFF
• Loop powered • Control input: without control • Line fault detection disabled	OFF	ON	ON	ON	OFF	X	OFF	OFF
Switches for channel I and II	S6							
Function								
Filter disable	OFF							
Filter enable	ON							

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



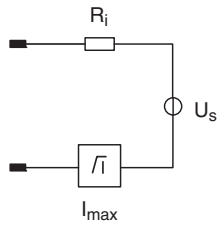
To reduce the power consumption of the device, we recommend to set the DIP switches of channel II in the OFF condition, when channel II is not used (single channel application).

Characteristic Curve

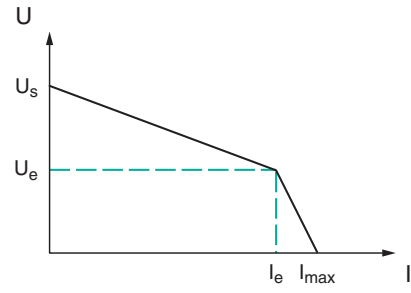
Output characteristics

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Output circuit diagram



Output characteristic



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