

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 61508 (loop powered)



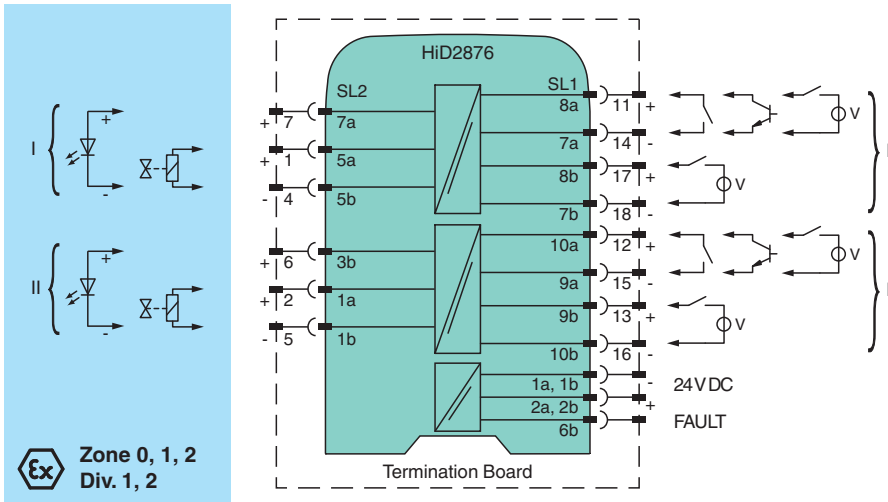
SIL 3



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, 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.

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	
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)

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

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Technical Data

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	
Dimensions	18 x 106 x 128 mm (0.7 x 4.2 x 5 inch)	
Mounting	on Termination Board	
Coding	pin 1 and 3 trimmed For further information see system description.	

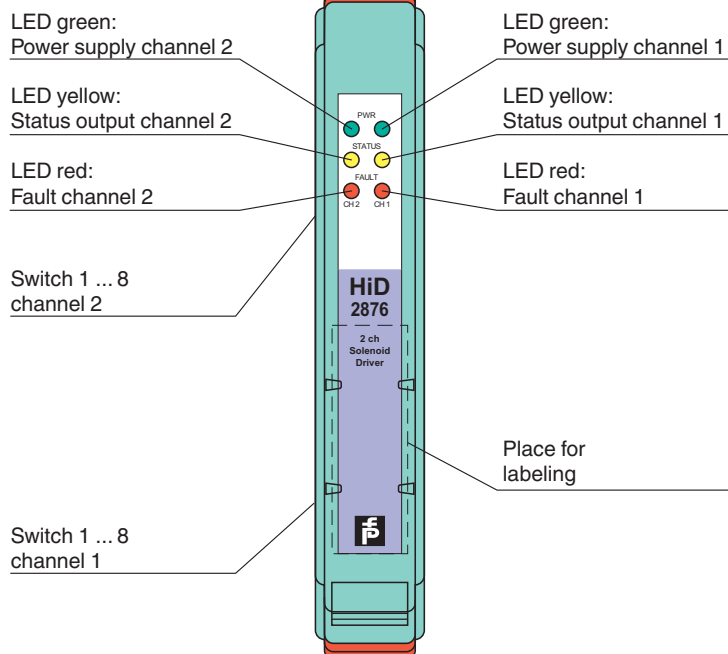
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Technical Data

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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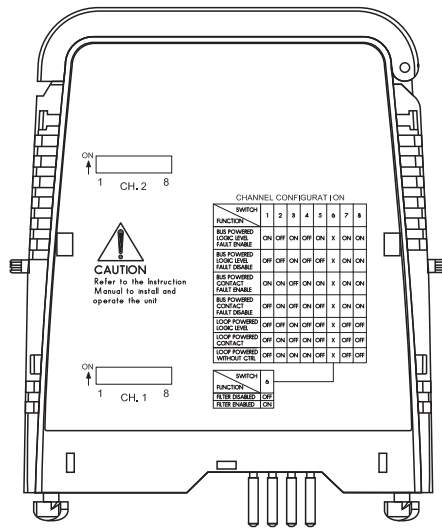
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Configuration



Switch settings

Switches for channel I and II	S1	S2	S3	S4	S5	S6	S7	S8
Function								
<ul style="list-style-type: none"> • Bus powered • Control input: logic signal • Line fault detection enabled 	ON	OFF	ON	OFF	ON	X	ON	ON
<ul style="list-style-type: none"> • Bus powered • Control input: logic signal • Line fault detection disabled 	OFF	OFF	ON	OFF	OFF	X	ON	ON
<ul style="list-style-type: none"> • Bus powered • Control input: contact • Line fault detection enabled 	ON	ON	OFF	ON	ON	X	ON	ON
<ul style="list-style-type: none"> • Bus powered • Control input: contact • Line fault detection disabled 	OFF	ON	OFF	ON	OFF	X	ON	ON
<ul style="list-style-type: none"> • Loop powered • Control input: logic signal • Line fault detection disabled 	OFF	OFF	ON	OFF	OFF	X	OFF	OFF
<ul style="list-style-type: none"> • Loop powered • Control input: contact • Line fault detection disabled 	OFF	ON	OFF	ON	OFF	X	OFF	OFF
<ul style="list-style-type: none"> • 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).

Configuration

The new device HiD2876 will replace the devices HiD2875, HiD2876, HiD2877 and HiD2878. The new device HiD2876 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 HiD2876. See following table.

Previous device	New device
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HiD2875, part number 121486 HiD2876, part number 121489				HiD2876, part number 204847									
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"> Bus powered Control input: contact Line fault detection disable 	OFF	OFF	ON	OFF	OFF	X	ON	ON	
Loop powered	ON	OFF	OFF	<ul style="list-style-type: none"> Loop powered Control input: without control 	OFF	ON	ON	ON	OFF	X	OFF	OFF	
Loop powered with control	OFF	OFF	OFF	<ul style="list-style-type: none"> Loop powered Control input: logic signal 	OFF	OFF	ON	OFF	OFF	X	OFF	OFF	
HiD2877, part number 121512 HiD2878, part number 121515				HiD2876, part number 204847									
Settings	S1	S2	S3	Settings	S1	S2	S3	S4	S5	S6	S7	S8	
Contact or open collector	ON	ON	OFF	<ul style="list-style-type: none"> Bus powered Control input: contact Line fault detection disable 	OFF	ON	OFF	ON	OFF	X	ON	ON	
Logic input	OFF	OFF	ON	<ul style="list-style-type: none"> Bus powered Control input: logic signal Line fault detection disable 	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

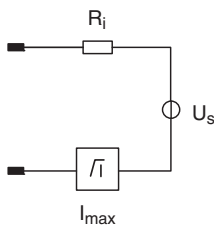


When both channels of the solenoid driver are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl+Fuchs for guidance.

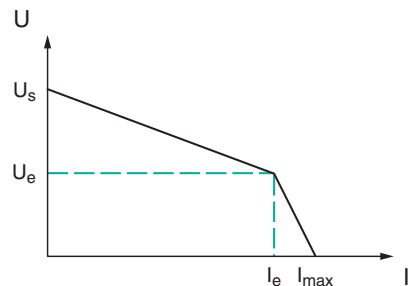
Characteristic Curve

Output characteristics

Output circuit diagram



Output characteristic



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