

Solenoid Driver

HiD2876



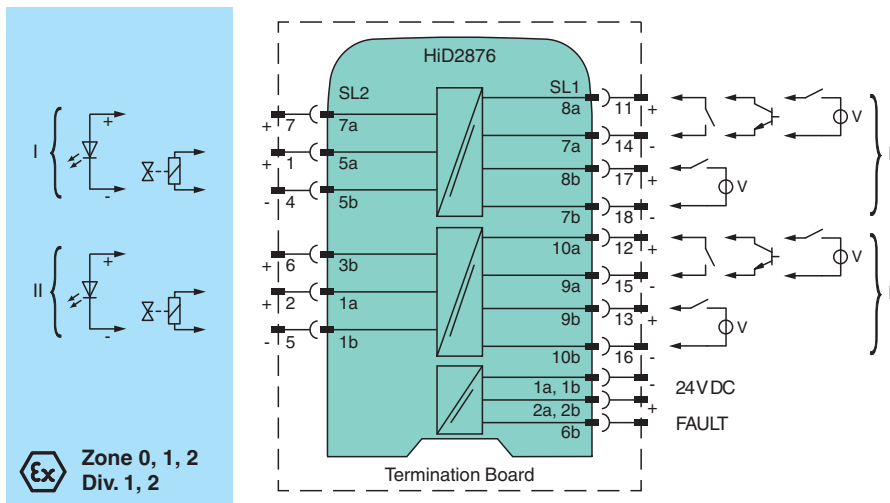
- 2-channel isolated barrier
- 24 V DC supply (bus or loop powered)
- Output 40 mA at 11.2 V DC, 55 mA current limit
- Contact or logic control input
- Entity parameter $I_o/I_{sc} = 93$ mA
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC/EN 61508 (bus powered)
- Up to SIL 3 acc. to IEC/EN 61508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

Connection



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

Pepperl+Fuchs Group
www.pepperl-fuchs.com

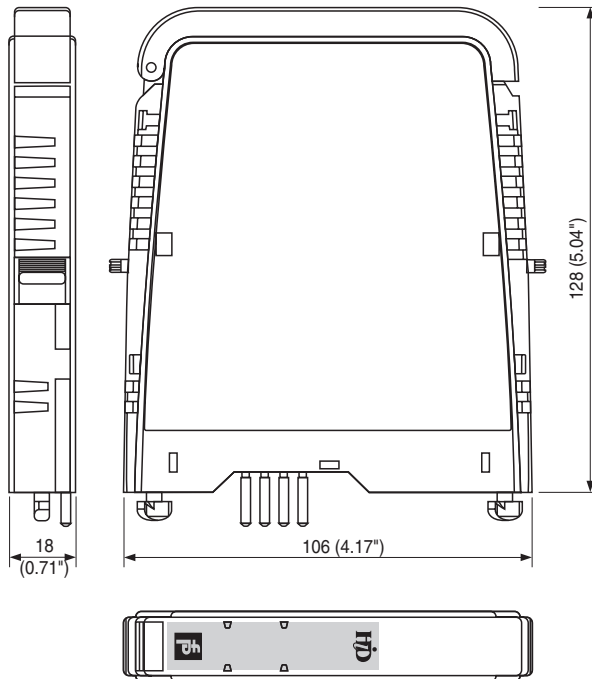
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PEPPERL+FUCHS

Dimensions



Technical Data

General specifications

Signal type	Digital Output
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Functional safety related parameters

Safety Integrity Level (SIL)	SIL 3
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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)
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

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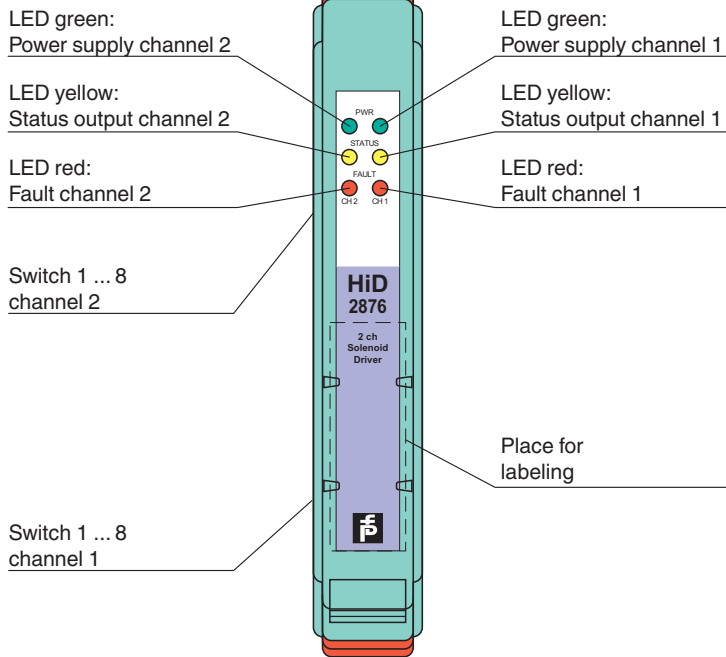
Technical Data

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 IEC/EN 60079-11, voltage peak value 60 V
Output/power supply, inputs, and collective error		safe electrical isolation acc. to IEC/EN 60079-11, 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 3 trimmed For further information see system description.
Data for application in connection with hazardous areas		
EU-type examination certificate		
Marking		CESI 10 ATEX 036
Output		⊕ II (1)GD [Ex ia] IIC, [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]
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		
Marking		PF 10 CERT 1729 X
Directive conformity		⊕ II 3G Ex nA IIC T4 Gc
Directive 2014/34/EU		
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 CES 10.0013
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com .

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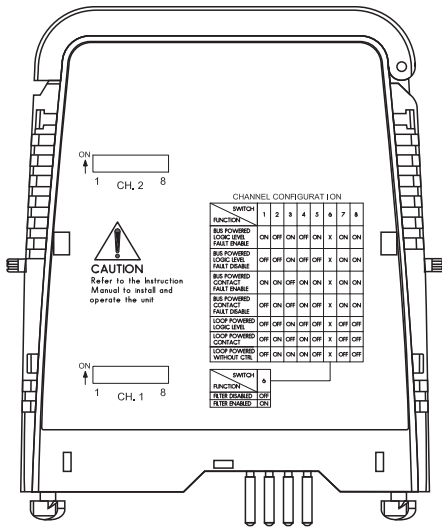
Assembly

Front view



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Configuration



Switch settings

Switches for channel I and II	S1	S2
Function		
<ul style="list-style-type: none"> Bus powered Control input: logic signal Line fault detection enabled 	ON	OFF
<ul style="list-style-type: none"> Bus powered Control input: logic signal Line fault detection disabled 	OFF	OFF
<ul style="list-style-type: none"> Bus powered Control input: contact Line fault detection enabled 	ON	ON
<ul style="list-style-type: none"> Bus powered Control input: contact Line fault detection disabled 	OFF	ON
<ul style="list-style-type: none"> Loop powered Control input: logic signal Line fault detection disabled 	OFF	OFF
<ul style="list-style-type: none"> Loop powered Control input: contact Line fault detection disabled 	OFF	ON
<ul style="list-style-type: none"> Loop powered Control input: without control Line fault detection disabled 	OFF	ON

Switches for channel I and II	S6
Function	
Filter disable	OFF
Filter enable	ON

Factory settings: bus powered, control input: contact, 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									
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	

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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 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.*

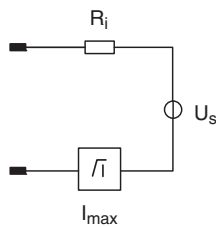
Installation Conditions



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.

Output characteristics

Output circuit diagram



Output characteristic

