Solenoid Driver

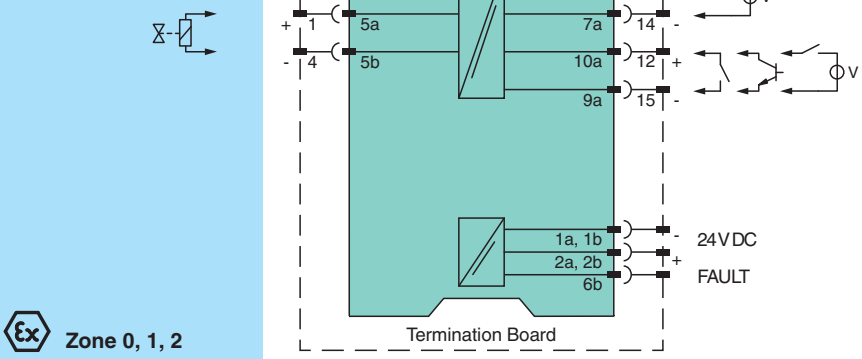
HiC2877

- 1-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)
- Test pulse immunity
- Up to SIL 3 acc. to IEC/EN 61508 (loop powered)

Function

This isolated barrier is used for intrinsic safety applications.
The device 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.
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 HiC 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
Power dissipation		1 W at 24 V, 300 Ω load

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Technical Data

Input		
Connection side		control side
Connection		SL1: 8a(+), 7a(-) loop powered SL1: 10a(+), 9a(-) bus 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 to 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 for loop powered
Inrush current		0.2 A , 15 ms loop powered
Output		
Connection side		field side
Connection		SL2: 5a(+), 5b(-)
Internal resistor	R_i	approx. 280 Ω
Current	I_e	≤ 40 mA
Voltage	U_e	≥ 11.2 V
Current limit	I_{max}	55 mA
Open loop voltage	U_s	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)
Line fault detection		
Short-circuit		< 25 Ω
Open-circuit		> 100 kΩ
Test current		< 4 mA
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/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
Factory setting		bus powered, input: dry contact, line fault detection enabled
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)
Mechanical specifications		
Degree of protection		IP20
Mass		approx. 100 g
Dimensions		12.5 x 106 x 128 mm (0.5 x 4.2 x 5.1 inch) (W x H x D)
Height		106 mm

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Technical Data

Width		12.5 mm
Depth		128 mm
Mounting		on termination board
Coding		pin 2 and 3 trimmed For further information see system description.
Data for application in connection with hazardous areas		
EU-type examination certificate		CESI 10 ATEX 046
Marking		⟨Ex⟩ II (1)G [Ex ia Ga] IIC ⟨Ex⟩ II (1)D [Ex ia Da] IIIC ⟨Ex⟩ I (M1) [Ex ia Ma] I
Output		Ex ia Ga, Ex ia Da, Ex ia Ma
Voltage	U_o	25.2 V
Current	I_o	93 mA
Power	P_o	586 mW
Supply		
Maximum safe voltage	U_m	253 V AC (Attention! U_m is no rated voltage.)
Certificate		KIWA 15 ATEX 0036 X
Marking		⟨Ex⟩ II 3G Ex ec IIC T4 Gc
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-7:2015+A1:2018
International approvals		
FM approval		
Control drawing		116-0431 (cFMus)
UL approval		
Control drawing		116-0383 (cULus)
IECEx approval		
IECEx certificate		IECEx CES 10.0017 IECEx KIWA 15.0018X
IECEx marking		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I Ex ec IIC T4 Gc
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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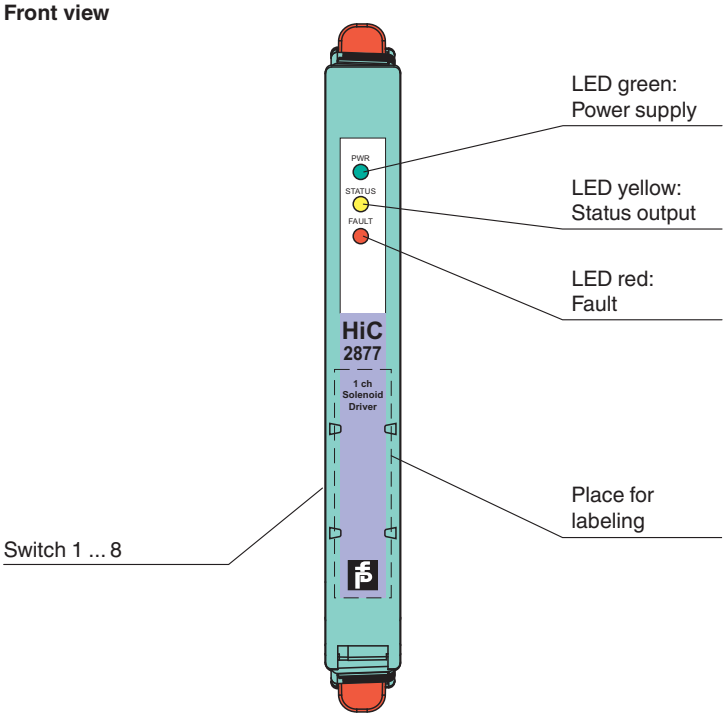
Assembly

Front view



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.

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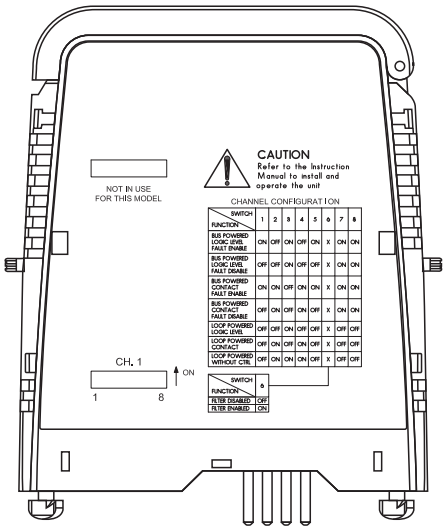
Configuration



Switch settings

Switches for channel I Function	S1	S2	S3	S4	S5	S6	S7	S8
• 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 Function	S6
Filter disable	OFF
Filter enable	ON

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

Characteristic Curve

Output characteristics

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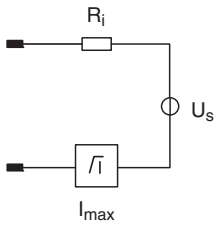
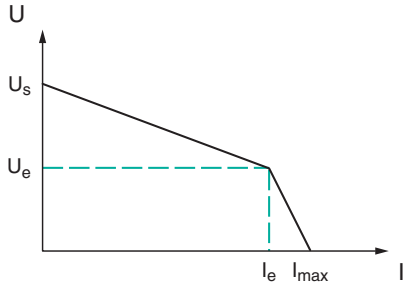
Output circuit diagram



Output characteristic



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