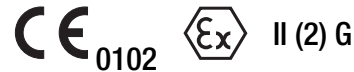


# Plug-in module SIRAX SD 810

## Solenoid driver



### Application

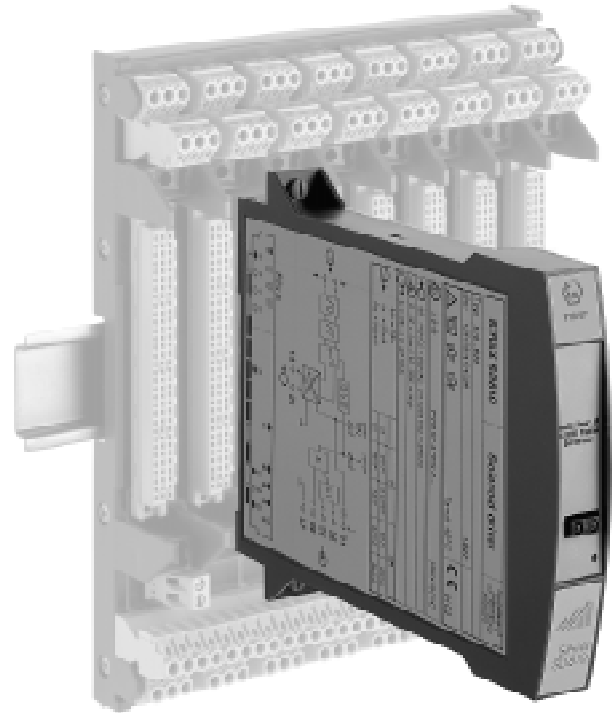
The single-channel solenoid driver **SIRAX SD 810** (Fig. 1) has been designed to control the intrinsically safe solenoid valves (e.g. **HERION, LUCIFER, SEITZ** and **BÜRKERT**) and to provide the supply for acoustic and visual alarms in explosion hazard areas. In order to cover the full range of solenoid valves, there are two alternative versions of intrinsically safe circuits with electronic current limiters available.

The power supply voltage ranges are 24...60 V DC/AC and 85...110 V DC / 230 V AC.

The active digital signals connected to the input terminals actuate the output in accordance with the input logic that has been chosen. An input can also be switched by a potentially-free contact.

The instrument fulfils all the important requirements and regulations concerning electromagnetic compatibility **EMC** and **Safe Isolation** (IEC 1010 resp. EN 61 010). It was developed and is manufactured and tested in strict accordance with the **quality assurance standard ISO 9001**.

Production QA is also certified according to guideline 94/9/EG.



### Features / Benefits

- **Input: Output activated by logic or contact inputs** (see Section "Electrical connections")

Output		Power supply (AC/DC power pack)
Voltage (adjustable)	Short-circuit current	
6...14.0 V DC 14.0 V DC 12 V DC 6 V DC	59 mA	24...60 V DC/AC or 85...110 V DC / 230 V AC (DC and 45...400 Hz)
6...18.0 V DC 18.0 V DC 12 V DC 6 V DC	29 mA	

- **SIRAX SD 810 plugs onto backplane** (mechanically latched by fasteners), **all electrical connections made to the backplane and not to the solenoid driver / Thus no wiring when replacing devices**
- **Electrically insulated between input, output and power supply / Fulfils IEC 1010 resp. EN 61 010**
- **AC/DC power supply / Universal**
- **Output in type of protection "Intrinsic safety" EEx ib IIC** (see "Table 5: Data on explosion protection")
- **Yellow LED signals an active valve control signal**
- **Green LED signals a power supply failure**

Fig. 1. Plug-in module SIRAX SD 810 for plugging onto backplane BP 902.

### Layout and mode of operation

The solenoid driver comprises a filter (F), switching regulator power supply (SNT), crowbar (CB), switch (S), voltage regulator (Spg-R), current limiter (ESBE) and the input circuit (E).

These perform the following functions: The EMC filter (F) suppresses electromagnetic interference that might damage the SD 810 and prevents in the reverse direction emission by the SD 810 to the environment.

The power supply (SNT) functions as a chopper with a blocking transformer.

The output is excited by the input circuit (E), the input signal being either a voltage in the range 0...30 V or a potentially-free contact depending on the position of a jumper. The switch (S) and via it the output are activated via an optical fibre connection.

# Plug-in module SIRAX SD 810 Solenoid driver

The regulation signal for the output voltage (Spg-R) from the shunt regulator is transferred via an optical fibre connection to the pulse-width modulator of the switching regulator IC. A jumper permits the output voltage to be selected to suit the load.

Zener diodes limit the voltage and two electronic current limiters (ESBE) the current of the intrinsically safe output circuit.

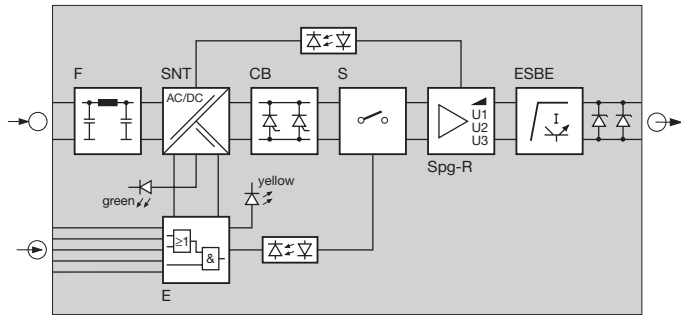


Fig. 2. Block diagram.

Output characteristics:

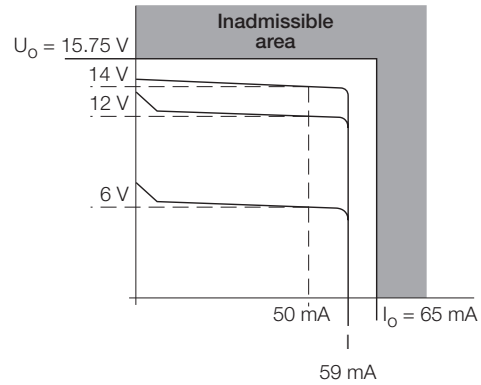


Fig. 3. Characteristic for type 810-6.1.

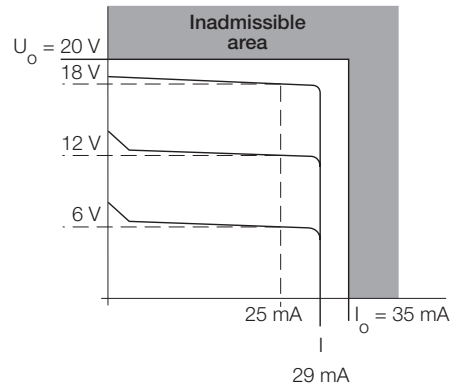


Fig. 4. Characteristic for type 810-6.2.

## Technical data

### Inputs E

Input voltage for OFF (logical "0"):	0...4 V DC
Input voltage for ON (logical "1"):	10...30 V DC
Input current with 24 V DC:	< 2 mA
Breaking delay:	< 200 $\mu$ s
Starting delay:	< 2 ms

### Output A (intrinsically safe acc. to EN 50 020)

Table 1: Output current circuit, voltage adjustable

Type	Voltage	Short-circuit current I
810-6.1	6 ... 14.0 V DC	59 mA $\pm$ 5%
	14.0 V DC, $\pm$ 5%	
	12 V DC, $\pm$ 5%	
	6 V DC, $\pm$ 5%	
810-6.2	6 ... 18.0 V DC	29 mA $\pm$ 5%
	18.0 V DC, $\pm$ 5%	
	12 V DC, $\pm$ 5%	
	6 V DC, $\pm$ 5%	

## Regulations

Electromagnetic compatibility:	The standards DIN EN 50 081-2 and DIN EN 50 082-2 are observed
Intrinsically safe:	Acc. to DIN EN 50 020: 1996-04
Electrical standards:	Acc. to IEC 1010 resp. EN 61 010
Protection (acc. to IEC 529 resp. EN 60 529):	Housing IP 40 Terminals IP 00
Rated insulation voltage:	253 V AC for all circuits
Contamination level:	2
Overvoltage category acc. to IEC 664:	III for power supply II for input and output
Electrical insulation:	Power supply versus all other circuits, input versus output
Test voltage:	Power supply versus input and output 3.7 kV, 50 Hz, 1 min. Input versus output 2.5 kV, 50 Hz, 1 min.

## Installation data

Housing:	Solenoid driver in housing B17 for plugging onto backplane BP 902. See section "Dimensional drawings" for dimensions
Material of housing:	Lexan 940 (polycarbonate), flammability class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen
Designation:	SIRAX SD 810
Mounting position:	Any
Electrical connections:	96-pin connector acc. to DIN 41 612, pattern C Layout see Section "Electrical connections"
Coding:	Solenoid driver supplied already coded. The backplane is coded by the user by fitting the coding inserts supplied
Weight:	Housing approx. 0.17 kg

## Suitable to valves:

Solenoid driver Type	Manufacturer	Valve Type
810-6.1	HERION	2010
		2011
		2012
		2013
	LUCIFER	48 86 50
		48 86 60
		48 86 70
810-6.2	HERION	2016
	SEITZ	11G52

## Environmental conditions

Climatic rating:	Climate class 3Z acc. to VDI/VDE 3540
Commissioning temperature:	- 10 to + 40 °C
Operating temperature:	- 25 to + 40 °C, <b>Ex - 20</b> to + 40 °C
Storage temperature:	- 40 to + 70 °C
Annual mean relative humidity:	≤ 75%

## Power supply H

AC/DC power pack (DC and 45...400 Hz)

Table 2: Nominal voltages and tolerances

Nominal voltage $U_N$	Tolerance
24 ... 60 V DC / AC	DC - 15 ... + 33% AC ± 15%
85 ... 230 V AC	± 10%
85 ... 110 V DC	- 15 ... + 10%

Power input: Approx. 2.8 W resp. 4 VA

## LED displays

Green LED:	Device standing by
Yellow LED:	For operating status

## Table 3: Standard versions

The following solenoid drivers are available in standard version. It is only necessary to quote the **Order No.:**

Description	Version / Power supply (nominal voltage $U_N$ )	Output** (intrinsically safe acc. to EN 50 020)	Order Code	Order No.
Single-channel solenoid driver <b>[EEx ib] IIC</b> , output in type of protection "Intrinsically safe EEx ib IIC" *	[EEx ib] IIC 24 ... 60 V DC / AC	14.0 V DC, I = 59 mA	810 - 611	120 460
	[EEx ib] IIC 85 ... 110 V DC / 230 V AC	14.0 V DC, I = 59 mA	810 - 621	125 080
	[EEx ib] IIC 24 ... 60 V DC / AC	18.0 V DC, I = 29 mA	810 - 612	125 098
	[EEx ib] IIC 85 ... 110 V DC / 230 V AC	18.0 V DC, I = 29 mA	810 - 622	125 105

\* Max. values see Table 5: "Data on explosion protection"

\*\* The output voltage can be adjusted in the range 6 to 14.0 V DC or 18.0 V DC or to 6 V DC or 12 V DC by appropriately positioning the jumper (Fig 6).

# Plug-in module SIRAX SD 810

## Solenoid driver

**Table 4: Ordering informations** (see also "Table 3: Standard versions")

DESCRIPTION	MARKING
<b>1. Mechanical design</b> Housing B17 (for plugging onto backplane BP 902, see data sheets BP 902)	810 - 6
<b>2. Version</b> / <b>Power supply H (nominal voltage <math>U_N</math>)</b> 1) [EEx ib] IIC / 24 ... 60 V DC / AC 2) [EEx ib] IIC / 85 ... 110 V DC / 230 V AC	1 2
<b>3. Output</b> (intrinsically safe acc. to EN 50 020) 1) 14.0 V DC $I \leq 59$ mA 2) 18.0 V DC $I \leq 29$ mA (can be adjusted by jumper in the range 6 V DC or 12 V DC or by potentiometer in the range 6 to 14.0 V DC resp. 18.0 V DC.	1 2

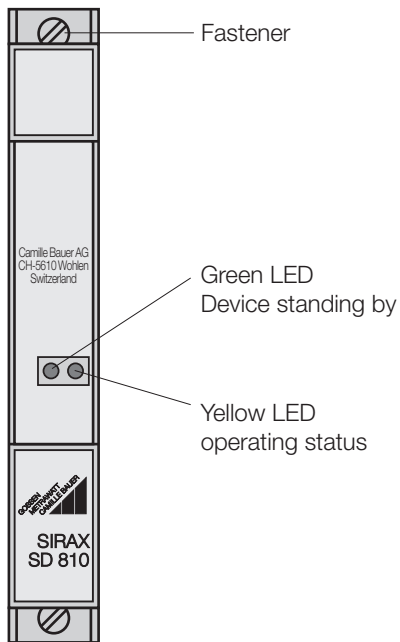
Possible special versions, e.g. increased climatic rating on inquiry

**Table 5: Data on explosion protection**  **II (2) G**

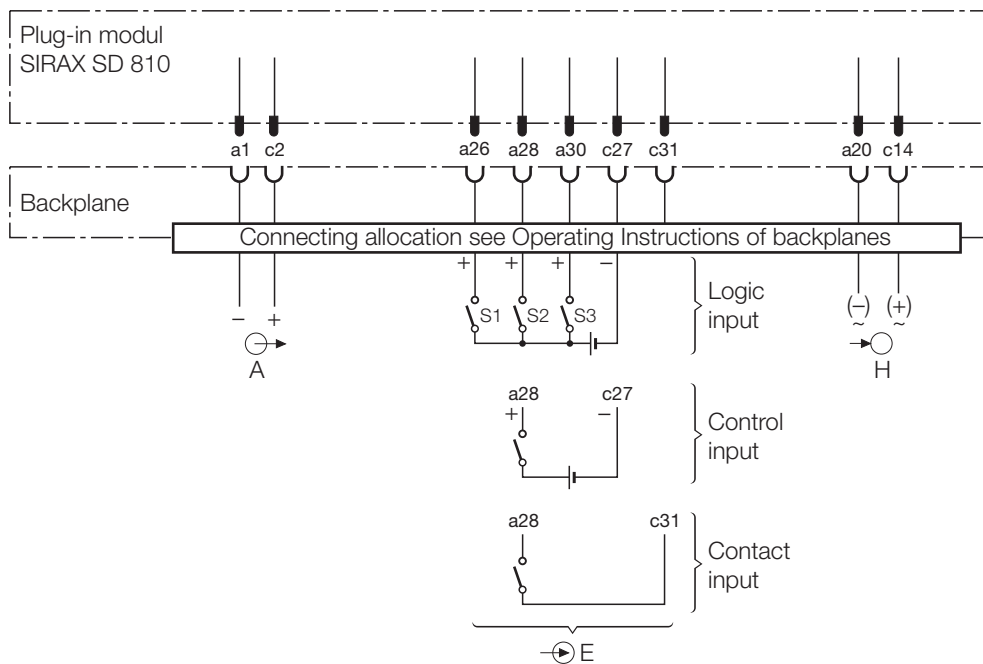
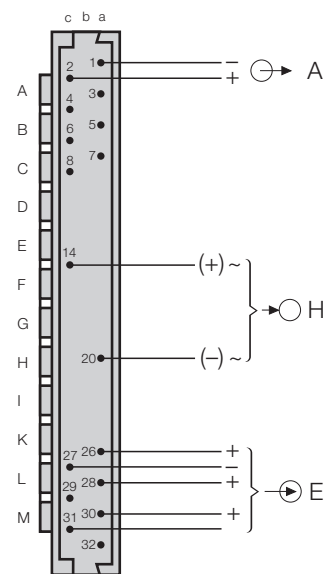
Order Code	Type of protection	Output	Input	Type test certificate	Mounting location of the device
810-611 810-621	[EEx ib] IIC	$U_o = 15.75$ V $I_o = 65$ mA $P_o = 1024$ mW electronic characteristic ib IIC $L_o$ 1.33 mH $C_o$ 142 nF resp. ib IIB $L_o$ 5 mH or 25 mH $C_o$ 489 nF or 306 nF	$U_m = 253$ V AC resp. 125 V DC	PTB 97 ATEX 2093	Outside the hazardous area
810-612 810-622	[EEx ib] IIC	$U_o = 20$ V $I_o = 35$ mA $P_o = 700$ mW electronic characteristic ib IIC $L_o$ 2 mH or 3.47 mH $C_o$ 86 nF or 73 nF resp. ib IIB $L_o$ 5 mH or 25 mH $C_o$ 377 nF or 284 nF	$U_m = 253$ V AC resp. 125 V DC		

## Electrical connections

SIRAX SD 810  
Front



SIRAX SD 810  
Rear



# Plug-in module SIRAX SD 810

## Solenoid driver

### Logic inputs

The valve driver output is activated by applying a low-voltage signal between the logic inputs of connections a26+, a28+ or a30+ and connection c27-. The inputs can be arranged in the following configurations 3 inputs as an **OR/AND** logic, 2 inputs as an **AND** logic, 2 inputs as an **OR** logic or for the connection of potentially-free contacts. The selection is made by positioning jumper J 206 (Fig. 6).

OFF signal voltage (logical "0"): 0 ... 4 V DC  
 ON signal voltage (logical "1"): 10 ... 30 V DC

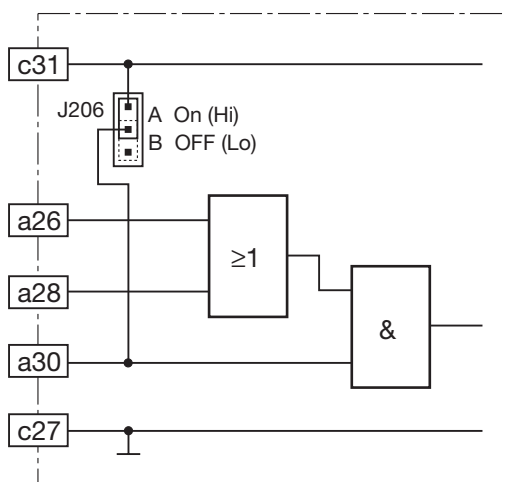


Fig. 5. Logic inputs.

### Potentially-free contact

The output of the SIRAX SD 810 can also be switched on and off by connecting a potentially-free contact between connections c31 and a28 and placing jumper J 206 in position A (Fig. 6).

### Configuration

#### Setting the output voltage

The output voltage is set either by adjusting the potentiometer P1 or positioning jumper J 201.

Output voltage		Position of jumper J 201
Type 810-6.1	Type 810-6.2	
6 ... 14.0 V DC	6 ... 18.0 V DC	▲
14.0 V DC	18.0 V DC	U 3
12 V DC	12 V DC	U 2
6 V DC	6 V DC	U 1

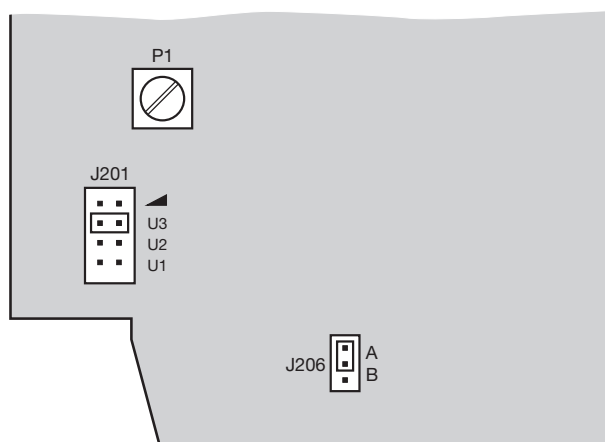


Fig. 6. Locations of potentiometer P1 and jumpers J 201 and J 206 (ex works J 201 is in position U3 and J 206 in position A).

## Table 6: Accessories and spare parts

Description	Order No.
<b>Coding comb with 12 sets of codes</b> (for coding the backplane BP 902)	107 971
<b>Data card</b> (for recording adjusted data)	130 443
<b>Operating Instructions SD 810-6 B</b> d-f-e	125 121

## Standard accessories

- 1 Operating Instructions for SIRAX SD 810, in three languages:  
German, French, English
- 1 Coding comb with 12 sets of codes
- 3 Data cards (for recording adjusted settings)
- 1 Type test certificate

## Dimensional drawing

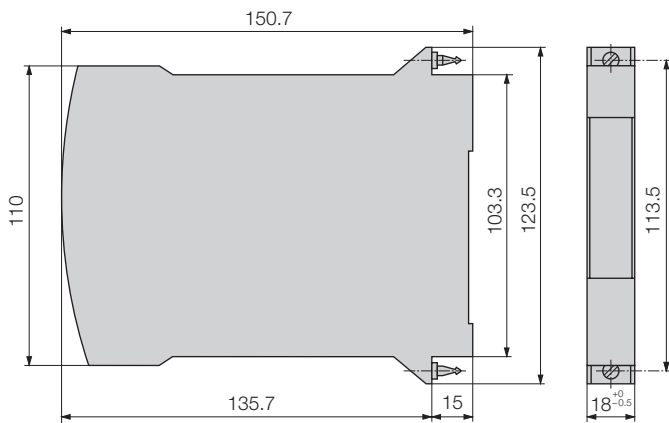


Fig. 7. SIRAX SD 810 in housing **B17**.

# Plug-in module SIRAX SD 810

## Solenoid driver

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