Plug-in module SIRAX TV 808, 1 channel Isolating amplifier, output Ex or non Ex

CAMILLE BAUER

For electrically insulating, amplifying and converting DC signals, also designed for FSK[1]

CE 0102 Ⓔx II (1) G

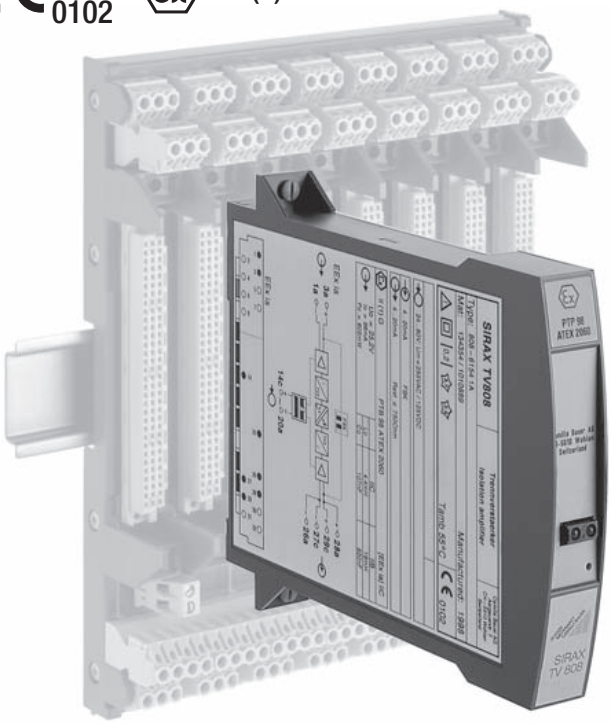

Fig. 1. Plug-in module SIRAX TV 808 for plugging onto backplane BP 902.

Application

The purpose of the isolating amplifier **SIRAX TV 808** (Fig. 1) is to electrically insulate input and output signals, respectively to amplify and/or change the signal level or type (current or voltage) of the input signals.

The instrument version SIRAX type 808-6164 1A has an **intrinsically safe output** and an **FSK continuity function** and is used to control smart I/P valve positioner in explosion hazard areas. The valve positioner adjust, for example, a pressure or the position of a valve in relation to the impressed output current (4…20 mA). The HART bypass permits bi-directional FSK signals to pass according to the HART protocol.

A green LED on the front plate indicates device standing by.

The power supply and the inputs and outputs are electrically insulated.

Variants

- Ⓔx and non-Ex isolating amplifiers
- Designed or not designed for FSK communication
- User-specific input ranges
- Power supply 24…60 V DC/AC or 85…230 V DC/AC

Features / Benefits

- **Isolating amplifier plugs onto backplane** (mechanically latched by fasteners)**, all electrical connections made to the backplane and not to the SIRAX TV 808 / Thus no wiring when replacing devices**
- **Designed for FSK communication, hand-held terminal connected to separate terminals. This facilitates operation in conjunction with a smart I/P valve positioner designed for FSK and with a HART or user-specific protocol**
- **Electric insulation between input, output (2.3 kV) and power supply (3.7 kV) / Prevents measurement errors due to potential leakage**
- **Burden voltage 20 V for not Ex versions or 15 V for Ex instruments**
- **Non-standard user-specific ranges available**
- **AC/DC power supply / Universal**
- **Available in type of protection "Intrinsic safety" [EEx ia] IIC** (see "Table 3: Data on explosion protection")

Technical data

Measuring input

DC current:	Standard range 4…20 mA Limit values 0…0.1 to 0…40 mA also live-zero, start value > 0 to ≤ 50% final value – 0.1…0…+ 0.1 to – 20…0…+ 20 mA max. span: ≤ 40 mA also bipolar asymmetrical R_i = 15 Ω
DC voltage:	Limit values 0…0.06 to 0…40 also live-zero, start value > 0 to ≤ 50% final value – 0.06…0…+ 0.06 to – 20…0…+ 20 V, max. span: ≤ 40 V R_i = 100 kΩ
Overload capacity:	DC current continuously 2-fold DC voltage continuously 2-fold

[1] *FSK = **F**requency **S**hift **K**eying*

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Measuring output ⊖►

DC current:	Standard ranges 4…20 mA, 0…20 mA 20…4 mA, 20…0 mA
Burden voltage:	Non-Ex version 20 V, Ex version 15 V
External resistance:	Non-Ex version 1000 Ω, Ex version 750 Ω
Current limiter at R_{ext} max.:	Approx. 1.1 × I_{AN}
Voltage limiter at $R_{ext} = \infty$:	Approx. 26 V
Residual ripple in output current:	0.5% p.p.
Response time:	< 50 ms

Power supply H →◯

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

Table 1: Nominal voltages and tolerances

Nominal voltage U_N	Tolerance	Instrument version
24... 60 V DC / AC	DC –15...+ 33% AC ± 15%	Standard (Non-Ex)
85...230 V [1] DC / AC		
24... 60 V DC / AC	DC – 15...+ 33% AC ± 15%	Type of protection "Intrinsically safe" [EEx ia] IIC
85...230 V AC	± 10%	
85...110 V DC	–15...+ 10%	

Power input: ≤ 1.2 W resp. ≤ 3 VA

Accuracy data (acc. to DIN/IEC 770)

Basic accuracy: Limit error ≤ ± 0.2%
Including linearity and reproducibility errors

Reference conditions:

Ambient temperature	23 °C, ± 2 K
Power supply	24 V DC ± 10% and 230 V AC ± 10%
Output burden	Current: 0.5 · R_{ext} max.

[1] *For power supplies > 125 V, the auxiliary circuits should include an external fuse with a rating ≤ 20 A DC.*

Influencing factors:

Temperature	< ± 0.1% per 10 K
Burden influence	< ± 0.1%
Longtime drift	< ± 0.3% / 12 months
Switch-on drift	< ± 0.2%
Common and transverse mode influence	< ± 0.2%
Output + or – connected to ground	< ± 0.2%

Installation data

Housing:	Isolating amplifier in housing B17 for plugging onto backplane BP 902. Refer to Section "Dimensional drawing" 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 TV 808
Mounting position:	Any
Electrical connections:	96-pin connector acc. to DIN 41 612, pattern C Layout see Section "Electrical connections"
Coding:	Isolating amplifier supplied already coded. The rack is coded by the user by fitting the coding inserts supplied
Weight:	Approx. 0.16 kg
Electrical insulation:	All circuits (measuring input / measuring output / power supply) are electrically insulated

Regulations

Electromagnetic compatibility:	The standards DIN EN 50 081-2 and DIN EN 50 082-2 are observed
Intrinsically safe:	Acc. to EN 50 020: 1994
Housing protection (acc. to IEC 529 resp. EN 60 529):	Housing IP 40 Terminals IP 00
Electrical standards:	Acc. to IEC 1010 resp. EN 61 010
Operating voltage:	< 300 V between all insulated circuits
Contamination level:	2
Overvoltage category acc. to IEC 664:	III for power supply II for measuring input and measuring output
Double insulation:	– Power supply versus all circuits – Measuring input versus measuring output

Test voltage:	Measuring input versus: – Measuring output 2.3 kV, 50 Hz, 1 min. – Power supply 3.7 kV, 50 Hz, 1 min. Measuring output versus: – Power supply 3.7 kV, 50 Hz, 1 min.	Commissioning temperature:	– 10 to + 55 °C
		Operating temperature:	– 25 to + 55 °C, **Ex – 20*** to + 55 °C
		Storage temperature:	– 40 to + 70 °C
		Annual mean relative humidity:	≤ 75%

Environmental conditions

Climatic rating:	Climate class 3Z acc. to VDI/VDE 3540

**The data of the EC-Type Examination Certificate for backplane SIRAX BP 902 with admission PTB 97 ATEX 2113 should be noted!*

Table 2: Ordering informations

DESCRIPTION			MARKING
1. Mechanical design			
Housing B17 (for plugging onto backplane BP 902, see data sheet BP 902)			808 - 6
2. Number of channels			
1) 1 channel			1
3. Version / Power supply			
5) [EEx ia] IIC, (Output intrinsically safe)	24 … 60 V DC/AC		5
6) [EEx ia] IIC, (Output intrinsically safe)	85 … 110 V DC / 230 V AC		6
7) Standard,	24 … 60 V DC/AC		7
8) Standard,	85 … 230 V DC/AC		8
4. Function			
1) 1 input, 1 electrically insulated output			1
4) 1 input, 1 electrically insulated output, designed for FSK communication (HART) (Condition: Input and output 4…20 mA)			4
5. Input signal			
1) 4 … 20 mA			1
9) Input	[V]		9
Z) Input	[mA]		Z
Line 9: [V] 0 … 0.06 to 0 … 40 also live-zero, start value > 0 to ≤ 50% final value [V] – 0.06 … 0 … + 0.06 to – 20 … 0 … + 20, max. span: ≤ 40 V also bipolar asymmetrical			
Line Z: [mA] 0 … 0.1 to 0 … 40 also live-zero, start value > 0 to ≤ 50% final value [mA] – 0.1 … 0 … + 0.1 to – 20 … 0 … + 20 max. span: ≤ 40 mA also bipolar asymmetrical			
6. Output signal			
A) 4 … 20 mA			A
B) 0 … 20 mA			B
C) 20 … 4 mA			C
D) 20 … 0 mA			D
With FSK communication (HART) only possible with 4 … 20 mA			

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

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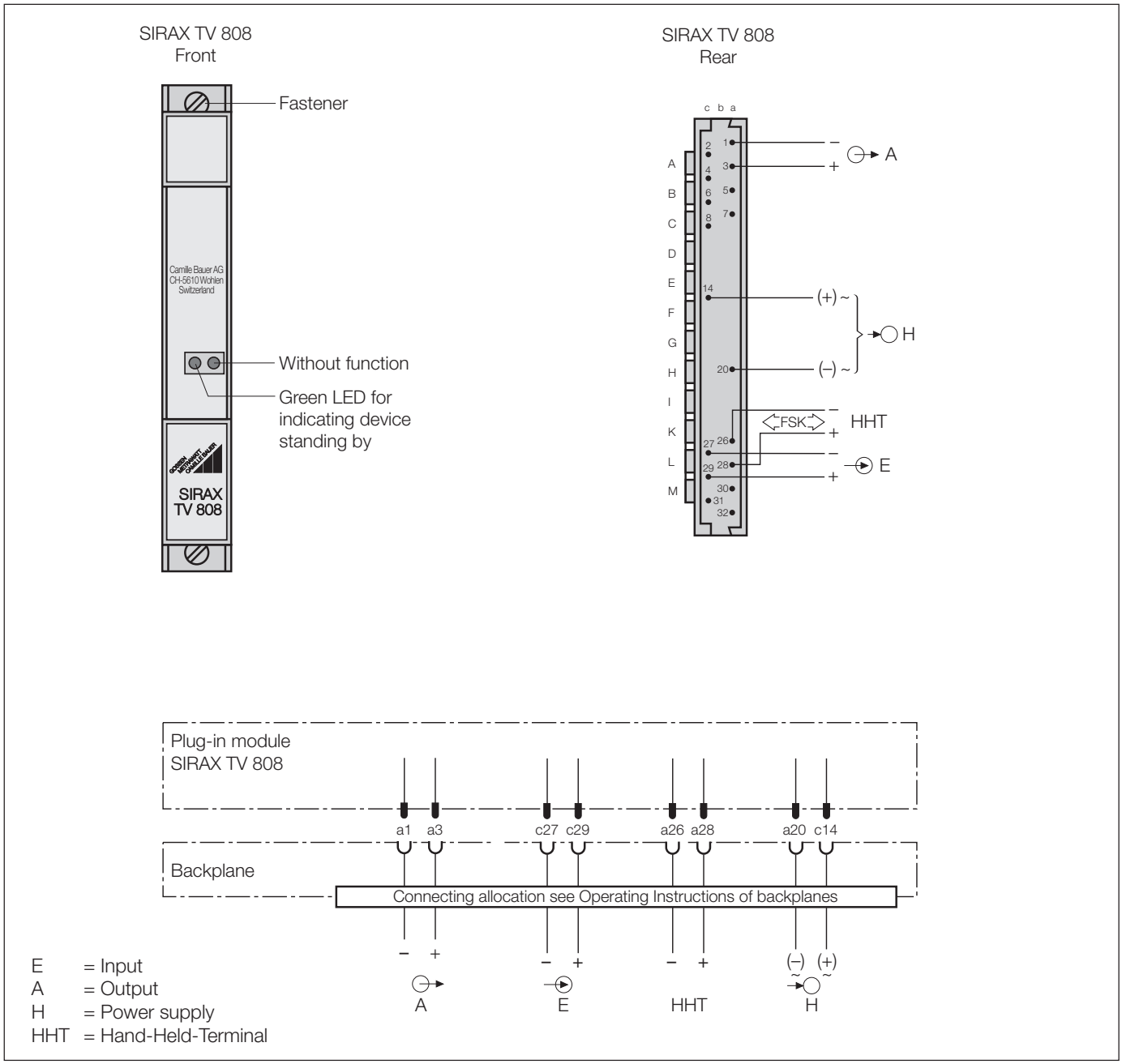
Table 3: Data on explosion protection ⟨Ex⟩ II (1) G

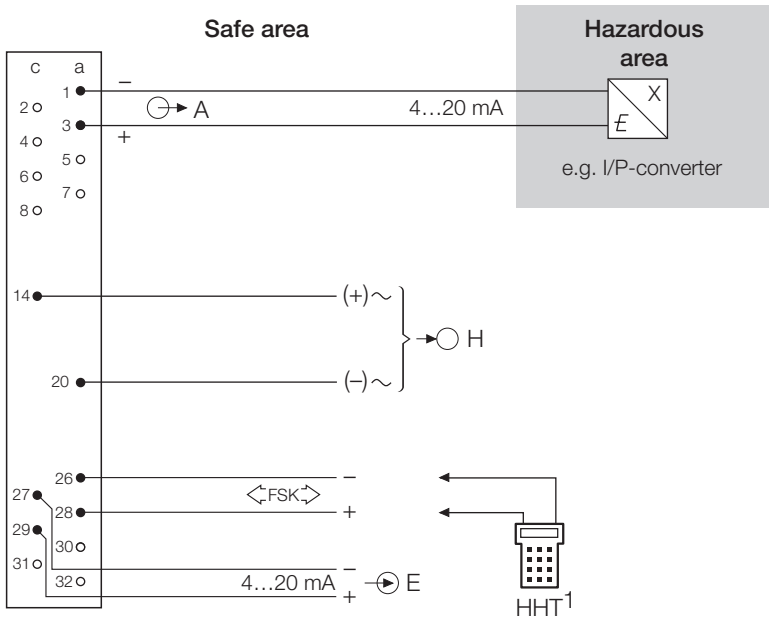
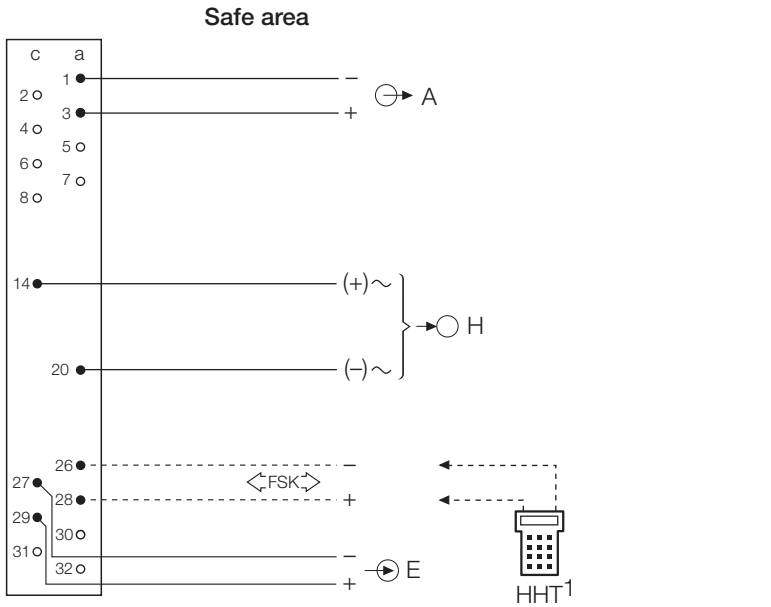
Order code	Type of protection	Output	Input/ Power supply	Type Examination Certificate	Mounting location
808-615. .. 808-616. ..	[EEx ia] IIC	U_o = 27.3 V I_o = 99 mA P_o = 675 mW IIC: L_o 4.1 mH, C_o 82 nF IIB: L_o 15 mH, C_o 677 nF	U_m = 253 V AC resp. 125 V DC	PTB 98 ATEX 2060	**Outside** the hazardous area

Electrical connections



Plug-in module SIRAX TV 808, 1 channel Isolating amplifier, output Ex or non Ex

Plug allocation

Instruments version	Wiring diagram / Plug arrangements
Types 808-6154 1A or 808-6164 1A input non-Ex, **Output Intrinsically safe,** Burden voltage **15 V,** **designed for FSK** Fig. 2	
Types 808-617. .. or 808-618. .. Input and output non-Ex, Burden voltage **20 V,** FSK (option) Fig. 3	

1 HHT = Hand-Held-Terminal

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Table 4: Accessories and spare parts

Description	Order No.
Coding comb with 12 sets of codes (for coding the backplane BP 902)	107 971
Operating Instructions TV 808-615/6/7/8 B d-f-e	136 839

Standard accessories

1 Operating Instructions for SIRAX TV 808 in three languages: German, French, English

1 Coding comb with 12 sets of codes

1 Type Examination Certificate (for instruments in type of protection “Intrinsically safe” only)

Compatibility

Most of the usual smart valve positioners (current-to-pneumatic converters) on the market with IS approval are compatible with the intrinsically safe output of the TV 808 (see Table 5). On inquiry, we will verify if other valve positioners can be used.

Table 5:

Manufacturer	Type	Ex designation	U_i [V]	I_i [mA]	P_i [mW]	L_i [mH]	C_i [nF]	Burden voltage [V] Burden [Ω]
Neles Jamesbury	**ND820**	EEx ia IIC T5, T6 Demko 96D. 120954	30	100	—	0	0	12.6 V 630 Ω
Elsag Bailey-H & B	**TZID**	EEx ia IIC T4, T5, T6 PTB Nr. -94.C.2133 X	30	150	1100	0.05	1.2	10.8 V 540 Ω
Samson	**3780**	EEx ia IIC T6 PTB Nr. Ex-94.C.4069	28	115	1000	0	5.3	10.8 V 540 Ω
Foxboro Eckhart	**SRD991**	EEx ia IIC (T6)	30	130	900	0	1.4	12.0 V 600 Ω
Fisher Controls	**Fieldvue DVC 5000**	EEx ia IIC T5 LCIE 95.D6115	30	227	1700	0	0	12.0 V 600 Ω
Siemens	**SIPART PS**	EEx ib IIC T4, T5, T6 PTB Nr. Ex-91, C, 2138 Zone 1	30	100	1000	1	6	11.0 V 550 Ω

Dimensional drawing

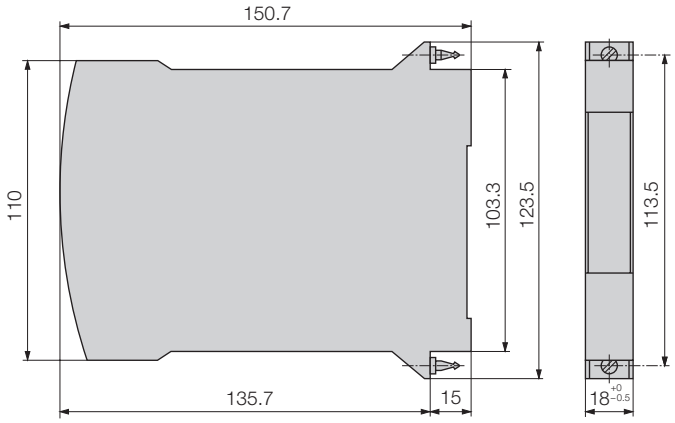

*Fig. 4. SIRAX TV 808 in housing **B17.***

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