Plug-in module SIRAX TI 807
Passive DC signal isolator

without power supply,
Ex- and non-Ex version

CE 0102 Ex II (1) G resp. II (2) G

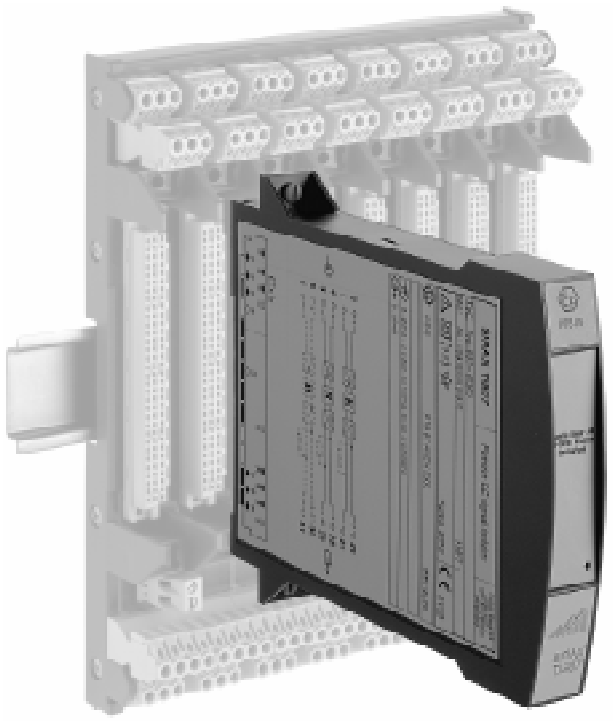


Fig. 1. Plug-in module SIRAX TI 807 for plugging onto backplane BP 902.

Application

The signal isolator **SIRAX TI 807** (Fig. 1) serves to electrically insulate the analogue DC signal in the range 0…20 mA which depending on version is then converted to a current or voltage signal (0…20 mA or 0…10 V). It operates passively and does not require a separate power supply, but derives the little auxiliary energy it needs from the DC signal.

The series of isolators also includes "intrinsically safe" explosion-proof versions with either an intrinsically safe **input** signal [EEx i**b**] IIC **or** intrinsically safe **output** signal [EEx i**a**] IIC. They are thus suitable for use in connection with intrinsically safe equipment installed in the hazardous area.

The SIRAX TI 807 is supplied with **two** or **three** channels.

The signal isolator 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

- **Signal isolator plugs onto backplane** (mechanically latched by fasteners)**, all electrical connections made to the backplane and not to the SIRAX TI 807 / Thus no wiring when replacing devices**
- **Electrically insulated analogue DC signals 0…20 mA / Prevents the transfer of interference voltages and currents. Solves grounding problems in meshed signal networks**
- **Highly accurate / Performs its isolating function with negligible transmission error**
- **No power supply required / Saves wiring costs and is easy to install in existing plants**
- **Available in type of protection "Intrinsic safety" [EEx ib] IIC or [EEx ia] IIC** (see "Table 5: Data on explosion protection")

Layout and mode of operation

Description of a function unit.

The DC signal isolator comprises a DC chopper Z, an isolating stage T, a rectifier G and an oscillator O.

The chopper converts the DC input signal E = 0…20 mA to an AC signal which is transformed with electrical insulation, rectified, smoothed and appears at the output as a DC **current** signal A = 0…20 mA (Fig. 2, left). Versions with a DC output **voltage** signal A = 0…10 V have a resistive burden of 500 Ω (Fig. 2, right).

The chopper is controlled by the oscillator which obtains its power from the DC signal.

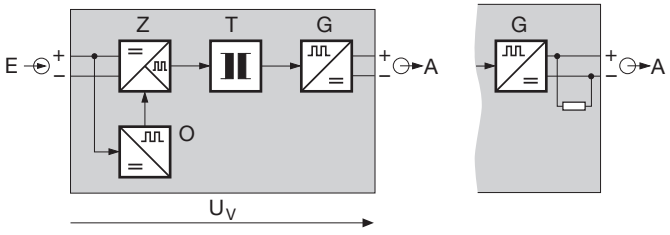


Fig. 2. Block diagram for a function unit.

Plug-in module SIRAX TI 807
Passive DC signal isolator

Technical data

Input signal E

DC current signal I_E: 0…20 mA

Max. permissible current: 50 mA

Voltage limiter: Non-Ex version: 27 V ± 5% (with zener diode)
Ex version: 18 V, ± 5%

Output signal A

(DC current **or** DC voltage)

DC current signal I_A: 0…20 mA

Voltage drop U_V:

< 2.6 V	with standard (non-Ex) version
< 4.5 V	with Ex versions (input signal(s) "intrinsically safe")
< 6.1 V	with Ex versions (output signal(s) "intrinsically safe")

Max. burden:

1000 Ω	with standard (non-Ex) version
500 Ω	with Ex versions (input signal(s) "intrinsically safe")
500 Ω	with Ex versions (output signal(s) "intrinsically safe")

Limit: Approx. 40 mA

Residual ripple: < 20 mV ss

Time constant: Approx. 3 ms

Response time[1] acc. to IEC 770: Approx. 15 ms

DC voltage signal U_A: 0…10 V

Voltage drop U_V:

< 2.6 V	with standard (non-Ex) version
< 4.5 V	with Ex versions (input signal(s) "intrinsically safe")
< 6.1 V	with Ex versions (output signal(s) "intrinsically safe")

Internal resistance: 500 Ω

Limit:

< 26 V	with standard (non-Ex) version
< 16 V	with Ex versions (input signal(s) "intrinsically safe")
< 16 V	with Ex versions (output signal(s) "intrinsically safe")

Residual ripple: < 20 mV ss

Time constant: Approx. 3 ms

Response time[1] acc. to IEC 770: Approx. 15 ms

Accuracy data

Error limits: < ± 0.1%
(Reference value 20 mA of output signal, typical linearity error included)
< ± 0.2%
(Reference value 10 V of output signal, typical linearity error included)

Reference conditions

DC current signal I_E: 0…20 mA

Ambient temperature: 23 °C ± 1 K

Output burden: 250 Ω
(at DC **current** output signal)
≥ 5 MΩ
(at DC **voltage** output signal)

Additional error

Burden influence: < 0.05% / 100 Ω
(at DC **current** output signal)

Temperature coefficient: < 50 ppm/K

Installation data

Housing: Signal isolator in housing B17 for plugging onto backplane BP 902.
Refer to 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 TI 807

Mounting position: Any

Electrical connections: 96-pin connector acc. to DIN 41 612, pattern C
Layout see Section "Electrical connections"

Coding: Signal isolator supplied already coded.
The rack is coded by the user by fitting the coding inserts supplied

Weight: Approx. 0.17 kg

[1] This is the time which transpires before the output signal reaches the error limit of 1% for a step change of the input signal from 0 ⌟⌜ 90%.

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 design:	Acc. to IEC 1010 resp. EN 61 010
Protection (acc. to IEC 529 resp. EN 60 529):	Housing IP 40 Terminals IP 00
Contamination level:	2
Overvoltage category acc. to IEC 664:	II
Test voltage:	2.3 kV, 50 Hz, 1 min. Inputs versus outputs Inputs versus inputs Outputs versus outputs
Surge voltage:	4.25 kV, 1.2/50 µs Inputs versus outputs Inputs versus inputs Outputs versus outputs

Ambient conditions

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

Standard versions

The following signal isolators are available in standard versions. It is only necessary to quote the **Order No.:**

Table 1: Instruments in standard (non-Ex) version (input *and* output signal *non intrinsically safe*)

Description	Number of isolation channels	Output signal	Order Code	**Order No.**
Passive **DC signal isolator**, standard (non-Ex) version, input signal 0…20 mA	2 channels	0…20 mA	807 – 6120	973 950
	3 channels	0…20 mA	807 – 6130	108 044
	2 channels	0…10 V	807 – 6122	108 052
	3 channels	0…10 V	807 – 6133	108 060

Table 2: Instruments in [EEx ib] IIC version (input signal intrinsically safe)

Description	Number of isolation channels	Output signal	Order Code	**Order No.**
Passive **DC signal isolator**, [EEx ib] IIC, input signal intrinsically safe 0…20 mA, output signal non intrinsically safe	2 channels	0…20 mA	807 – 6220	108 119
	3 channels	0…20 mA	807 – 6230	108 127
	2 channels	0…10 V	807 – 6222	108 135
	3 channels	0…10 V	807 – 6233	108 143

Plug-in module SIRAX TI 807
Passive DC signal isolator

Table 3: Instruments in [EEx ia] IIC version (output signal intrinsically safe)

Description	Number of isolation channels	Output signal	Order Code	**Order No.**
Passive **DC signal isolator**, [EEx ia] IIC, input signal non intrinsically safe 0…20 mA, output signal intrinsically safe	2 channels	0…20 mA	807 – 6620	108 078
	3 channels	0…20 mA	807 – 6630	108 068
	2 channels	0…10 V	807 – 6622	108 094
	3 channels	0…10 V	807 – 6633	108 101

Table 4: Order informations (see also Tables 1 to 3: “Standard versions”)

DESCRIPTION	MARKING
1. Mechanical design	
Housing B17 (for plugging onto backplane BP 902, see data sheets BP 902)	807 - 6
2. Version	
1) Standard (non-Ex)	1
2) [EEx ib] IIC, input signals intrinsically safe	2
6) [EEx ia] IIC, output signals intrinsically safe	6
3. Number of isolation channels	
2) 2 channels	2
3) 3 channels	3
4. Output signals (A1 and A2 or A1, A2 and A3)	
0) 0 … 20 mA	0
2) 0 … 10 V, 2 channels	2
3) 0 … 10 V, 3 channels	3

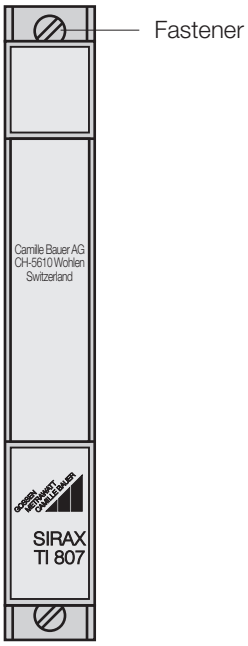
Possible special versions, e.g. increased climatic rating on inquiry

Table 5: Data on explosion protection ⟨Ex⟩ II (2) G resp. II (1) G

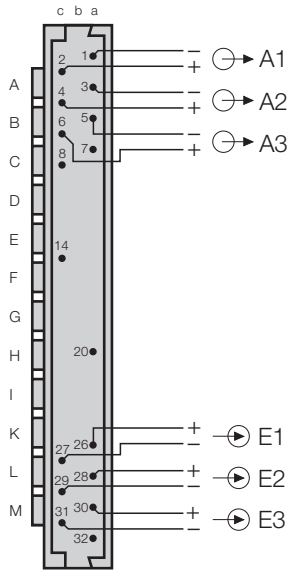
Order Code	Type of protection	Input	Output	Type examination certificate	Mounting location
807-62...	[EEx ib] IIC	**L_i = 0.03 mH** **C_i = 0** for connection to certified intrinsically safe circuit with following maximum values: **$U_o \leq$ 30 V** **$I_o \leq$ 100 mA**	U_m = 253 V AC resp. 125 V DC	PTB 97 ATEX 2102	**Outside** the hazardous area
807-66...	[EEx ia] IIC	U_m = 253 V AC resp. 125 V DC	**U_o = 15.75 V** **I_o = 100 mA** **P_o = 400 mW** linear characteristic IIC: L_o 4 mH, C_o 478 nF IIB: L_o 15 mH, C_o 2.88 µF		

Electrical connections

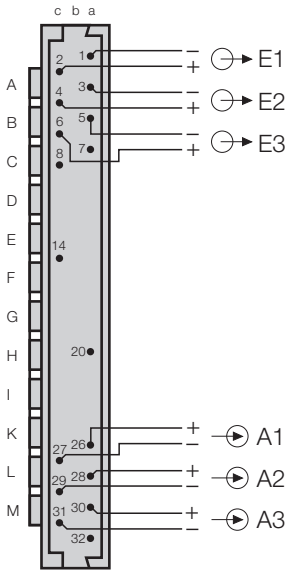
SIRAX TI 807
Front



SIRAX TI 807-61..
and
SIRAX TI 807-66..
Rear



SIRAX TI 807-62..
Rear



E1, E2, E3 = Input signals
A1, A2, A3 = Output signals

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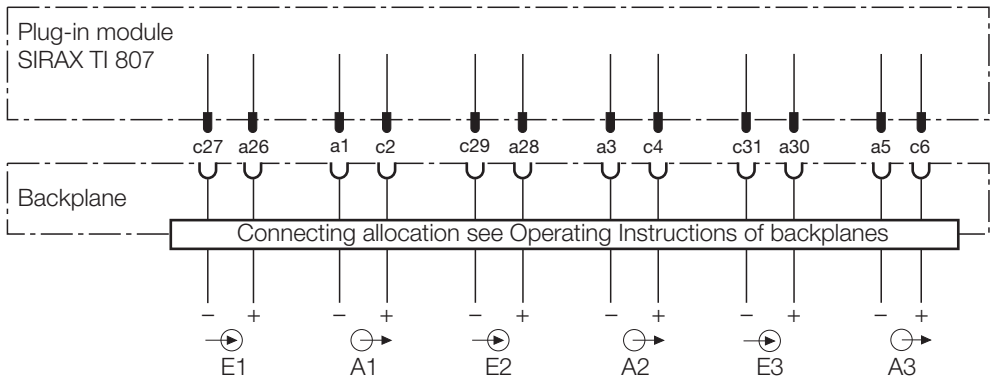
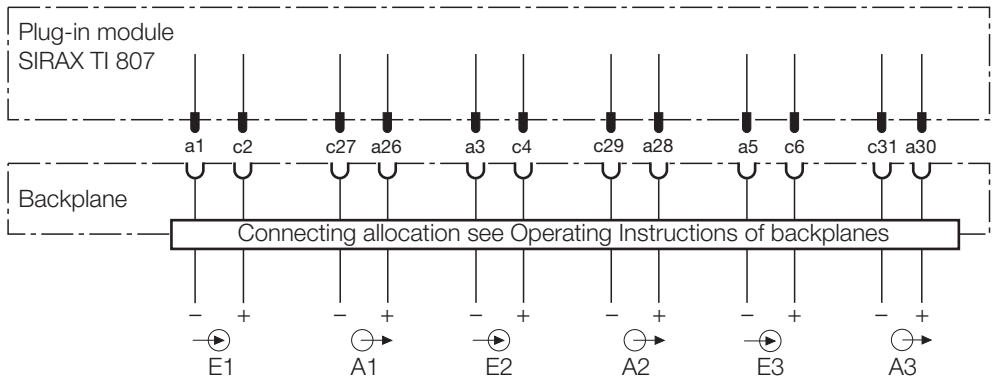


E1, E2, E3 = Input signals
A1, A2, A3 = Output signals

Fig. 3. SIRAX TI 807-61.., standard (non-Ex) version
and
SIRAX TI 807-66.., Ex version, (output signals intrinsically safe).



E1, E2, E3 = Input signals
A1, A2, A3 = Output signals

Fig. 4. SIRAX TI 807-62.., Ex version, (input signals intrinsically safe).

Table 6: Accessories and spare parts

Description	Order No.
Coding comb with 12 sets of codes (for coding the backplane BP 902)	107 971
Operating Instructions TI 807-6 B d-f-e	108 151

Standard accessories

1 Operating Instructions for SIRAX TI 807, in three languages: German, French, English

1 Coding comb with 12 sets of codes

1 Type examination certificate (only for instruments in type of protection “Intrinsically safe”)

Dimensional drawing

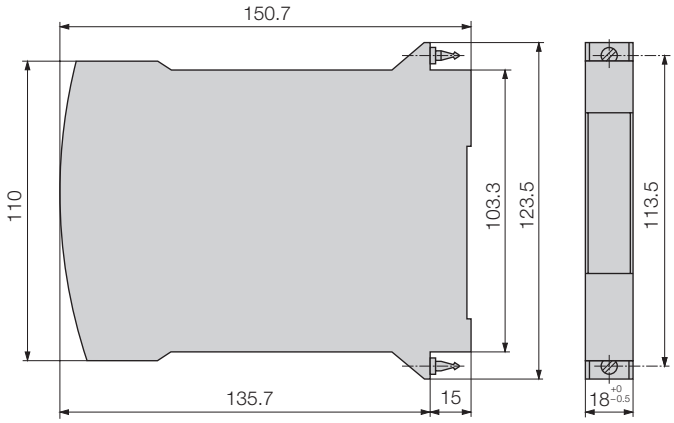


*Fig. 5. SIRAX TI 807 in housing **B17.***

Plug-in module SIRAX TI 807
Passive DC signal isolator

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