

SINEAX TI 816

Passive DC Signal Isolator

without power supply,
in carrying rail housing



Application

The signal isolator **SINEAX TI 816** (Fig. 1) serves to electrically insulate an analog 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.

Its narrow casing is designed for mounting on different types of standard rails. A number of signal isolators can be mounted immediately next to each other and where there are many DC signals to be isolated can form a compact isolator block.



Fig. 1

Features / Benefits

- Electrically insulated analog 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 needed / Saves wiring costs and is easy to install in existing plants
- The device fulfils the protection requirements of the EMC guidelines (89/336/EWG) / The device bears the CE symbol for EMC. See "Table 2: Electromagnetic compatibility"
- Small and compact / Makes best use of the available space

Layout and mode of operation

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 to an AC signal which is transformed with electrical insulation, rectified, smoothed and appears at the output as a DC **current** signal A (Fig. 2, left). Versions with a DC output **voltage** signal A have a resistive burden through which the current flows (Fig. 2, right).

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

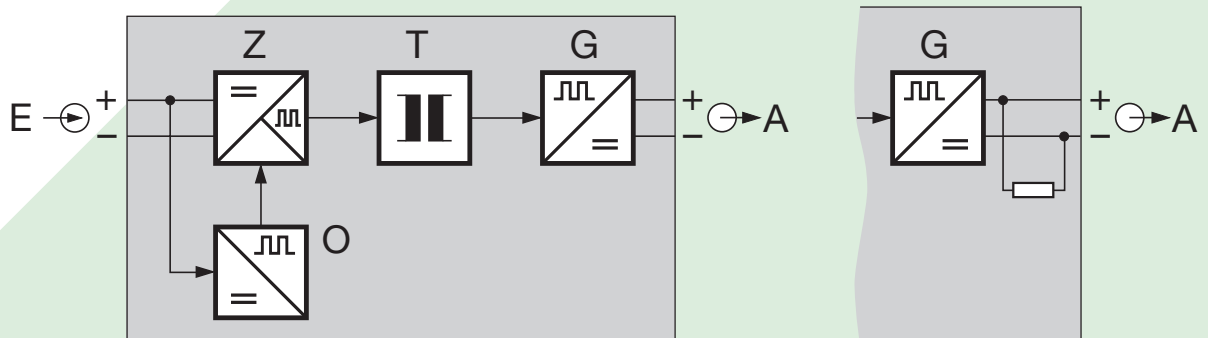


Fig. 2. Schematic diagram.

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Technical data

Input signal E \rightarrow

DC current:	0...20 mA
Max. permissible :	50 mA
Voltage limiter:	18 V \pm 5% (with zener diode)
Voltage drop:	< 2.1 V (for 500 Ω burden)
Overshoot:	< 20 μ A (typical 5 μ A)

Output signal A \leftarrow

DC current or DC voltage:	0...20 mA or 0...10 V
Limit:	Approx. 30 mA ¹ Approx. 15 V ²
Max. burden:	600 Ω ¹
Internal resistance:	500 Ω ²
Residual ripple:	< 20 mV ss
Time constant:	Approx. 5 ms

Accuracy data

Error limits:	< \pm 0.1% ¹ (reference value 20 mA, linearity error included) < \pm 0.2% ² (reference value 10 V, linearity error included)
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Reference conditions:

Ambient temperature	23 $^{\circ}$ C \pm 1 K
Output burden	100 Ω ¹ \geq 5 M Ω ²

Additional error:

Burden influence	< 0.2% (at 500 Ω) ¹
Temperature coefficient	< 50 ppm/K

Installation data

Mechanical design:	Carrying rail housing N12 Dimensions see section "Dimensional drawings"
Material of housing:	Lexan 940 (polycarbonate) Flammability Class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen

Mounting:

Snapping

- onto G-type rail
acc. to EN 50 035-G32
- or
- onto top-hat rail
acc. to EN 50 022-35 \times 7.5

Mounting position:

Any

Electrical connections:

- Screw terminals with wire protection
- for 0.2 to 4 mm² non-stranded wires
 - or
 - for 0.2 to 2.5 mm² stranded wires

Weight:

Approx. 35 g

Regulations

Electrical design:	Acc. to IEC 1010
Protection:	Housing IP 40 acc. to EN 60 529, Terminals IP 20
Test voltage:	500 V _{eff} , 50 Hz, 1 min.
Max. surge voltage:	800 V

Ambient conditions

Climatic rating:	Climate class 3Z acc. to VDI/VDE 3540
Operating temperature:	– 20 to + 65 $^{\circ}$ C
Storage temperature:	– 40 to + 85 $^{\circ}$ C
Annual mean relative humidity:	\leq 75% standard climatic rating
Seismic test:	5 g, < 200 Hz, 2 h in each of 3 directions
Shock test:	50 g 10 shocks in each of 3 directions
Altitude:	Max. 2000 m
Indoor use only!	

¹ With current signal

² With voltage signal

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Table 1: Versions (stock)

There are two versions of the DC signal isolator SINEAX TI 816 both of which are available ex stock. Quoting the **order No.** is sufficient when ordering:

Description	Output signal A	Order Code	Order No.
Passive DC signal isolator input signal E: 0...20 mA, with 1 isolation and transmission channel, in carrying rail housing N12	0...20 mA	816 - 5110	990 722
	0...10 V	816 - 5111	994 089

Table 2: Electromagnetic compatibility

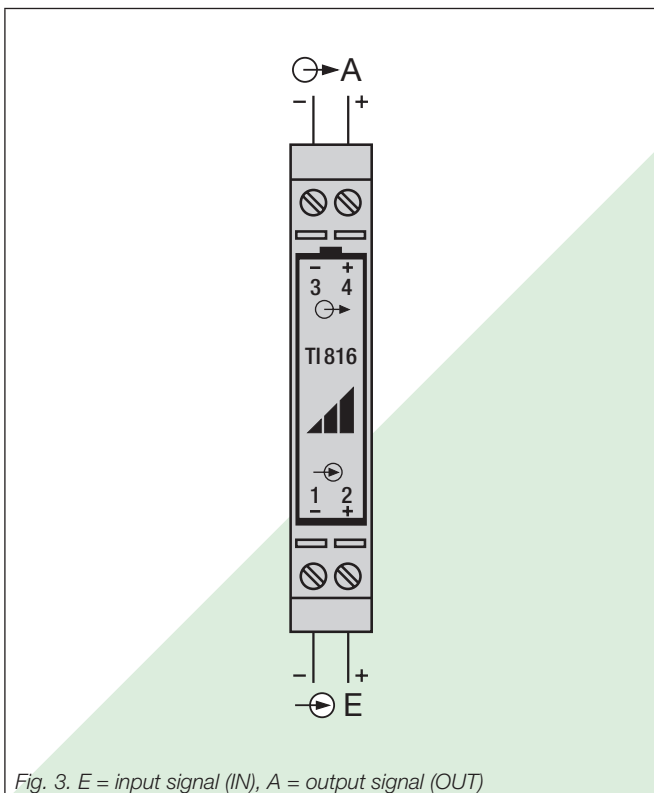
Reference was made to the general standards EN 50 081-2 and EN 50 082-2

Conducted interference from the instrument	EN 55 011	Group 1, Class A
HF radiation from complete instrument	EN 55 011	Group 1, Class A
Electrostatic discharge	IEC 1000-4-2	Direct: ± 8 kV air Indirect: ± 6 kV contact
HF field influence on instrument	IEC 1000-4-3	80 MHz...1000 MHz: 10 V/m, 80% AM 1 kHz (ITU-frequencies, 3 V/m)
Transient burst via connections	IEC 1000-4-4	± 2 kV, 5/50 ns, 5 kHz, > 2 min. capacitively coupled
HF interference via connections	IEC 1000-4-6	0.15 to 80 MHz: 10 V, 80% AM 1 kHz (ITU-frequencies, 3 V)

The device fulfils the protection requirements of the EMC guidelines (89/336/EWG). **The device bears the CE symbol for EMC.**

Electrical connections

Standard accessories



1 Operating Instruction each in German, French and English

Fig. 3. E = input signal (IN), A = output signal (OUT)

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Dimensional drawings

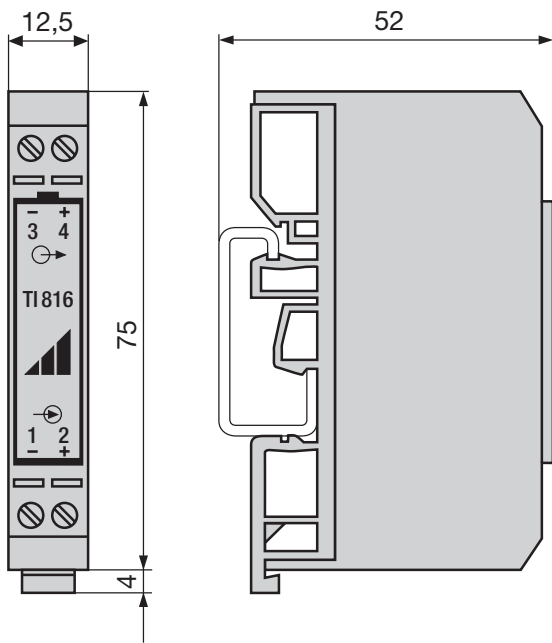


Fig. 4. SINEAX TI 816 in carrying rail housing **N12** on G-type rail EN 50 035 – G 32.

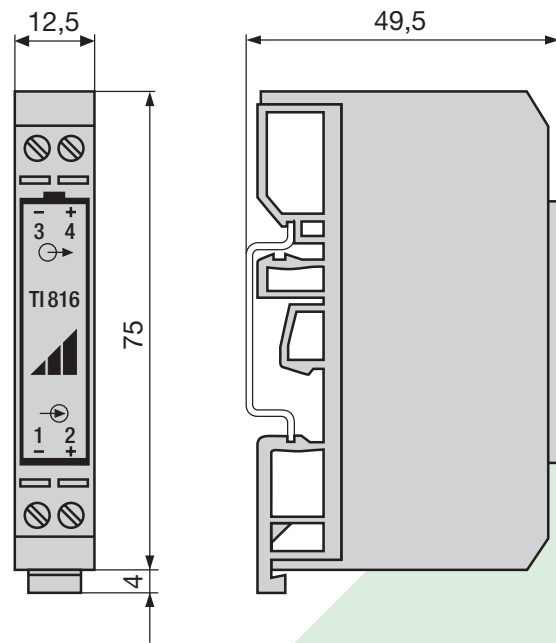


Fig. 5. SINEAX TI 816 in carrying rail housing **N12** on top-hat rail EN 50 022 – 35 x 7.5.