SINEAX TI 816
Passive DC signal isolator

without power supply,
in carrying rail housing

CE

Application

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

Its narrow casing is designed for mounting on different types of standard rails (Fig. 2). 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



Fig. 2

Features / Benefits

- 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 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 1: 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. 3, left). Versions with a DC output voltage signal A have a resistive burden through which the current flows (Fig. 3, right).

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

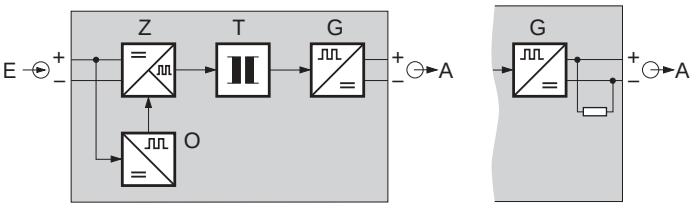


Fig. 3. Schematic diagram.

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Technical data

Input signal E

DC current:	0…20 mA
Max. permissible current:	50 mA
Voltage limiter:	18 V ± 5% (with zener diode)
Voltage drop:	< 2,1 V (for 500 Ω burden)
Overshoot:	< 20 μA (typical 5 μA)

Output signal A

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:	< ± 0.1% [1] (reference value 20 mA, linearity error included) < ± 0.2% [2] (reference value 10 V, linearity error included)

Reference conditions:

Ambient temperature	23 °C ± 1 K
Output burden	100 Ω [1] ≥ 5 MΩ [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 50 022-35×7.5
Mounting position:	Any
Electrical connections:	Screw terminals with wire protection clamps – 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 Vrms, 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 °C
Storage temperature:	–40 to + 85 °C
Annual mean relative humidity:	≤ 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

[1] With current signal
[2] With voltage signal

Table 1: 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.**

Table 2: 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

Electrical connections



Fig. 4

E = Input signal (IN)
A = Output signal (OUT)

Standard accessories

1 Operating manual each in German, French and English

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Dimensional drawings

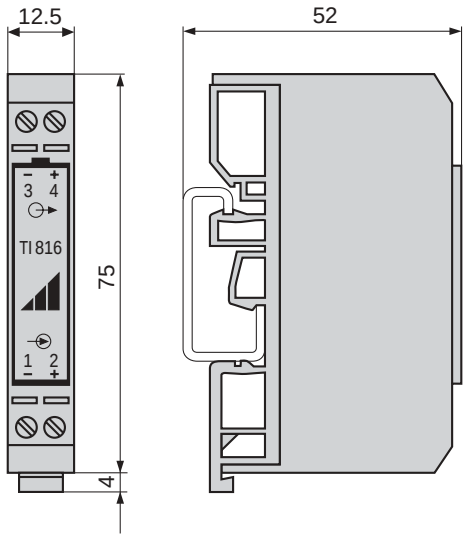


Fig. 5. SINEAX TI 816 in carrying rail housing N12 on G-type rail EN 50 035 – G 32.

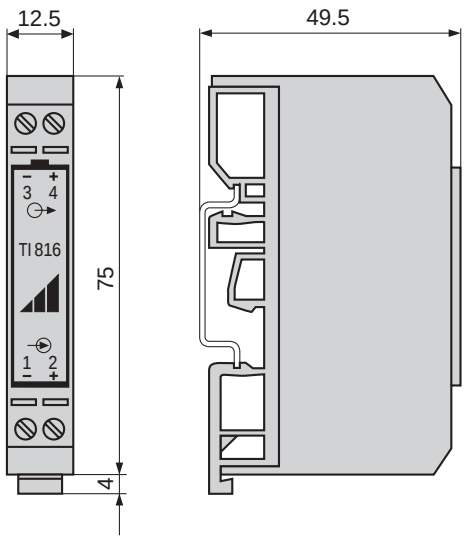


Fig. 6. SINEAX TI 816 in carrying rail housing N12 on top-hat rail EN 50 022 – 35×7.5.

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