

## TI 816 DC Signal Isolator

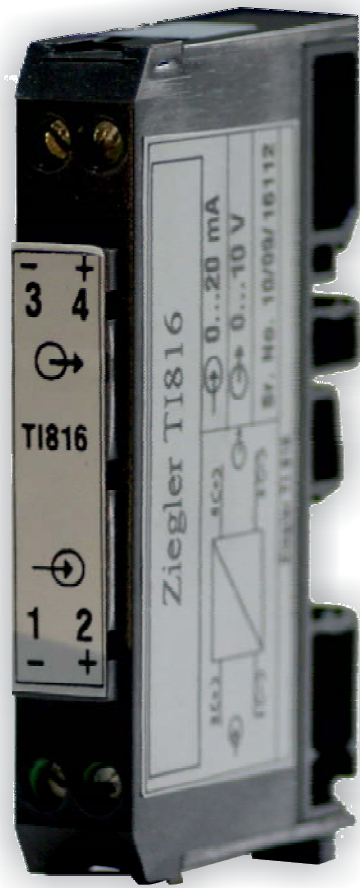


Fig. 1



Fig. 2

**Without power supply, In carrying rail housing**

**Application :**

The signal isolator TI 816 (Fig. 1) Serves to electrically insulate and 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 on different type 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.

**Function**

The DC signal isolator serves to electrically isolate the analog DC signal in the range from 0 ( 4 ) - 20 mA which depending on version is then converted to a current signal 0 ( 4 ) - 20 mA or voltage signal 0 ( 2 ) - 10 V. It does not require a separate power supply, but derives the little auxiliary power it needs from the DC signal.

**Features / Benefits**

- Electrically isolated analog DC signals 0 - 20 mA - prevents the transfer of interference voltages and currents. Solves grounding problems in meshed signal networks.
- No separate power supply needed / saves wiring costs & is easy to install in existing plants.
- Snaps onto a DIN rail or screw onto a wall or panel- easily adaptable to the mounting facility at the place of installation ( TI 816)
- Small & compact / Makes best use of the available space.

**Layout and Mode of Operation**

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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.

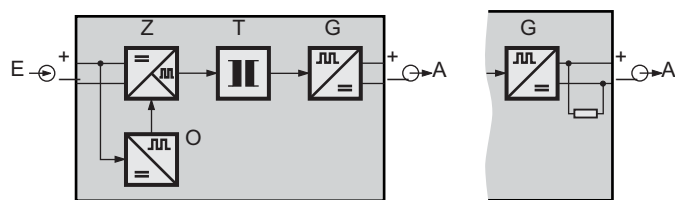


Fig. 3. Schematic diagram.

**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 : ± 8kV 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 ).

**Technical Data**

**Input signal E** →

DC current	0(4)...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 mA ( typical 5 mA )

**Output signal A**

DC current or DC voltage	0(4)...20 mA or 0(2)...10 V
Limit	Approx. 30 mA <sup>1</sup> Approx. 15 V <sup>2</sup>
Max. burden	600 Ω <sup>1</sup>
Internal resistance	500 Ω <sup>2</sup>
Residual ripple	< 20 mV ss
Time constant	Approx. 5 ms

**Accuracy data**

Error limits	< ± 0.1 % <sup>1</sup> ( reference value 20 mA, linearity error included ) < ± 0.2 % <sup>2</sup> ( reference value 10 mA, linearity error included )
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**Reference conditions**

Ambient temperature	23 °C ± 1 K
Output burden	100 Ω <sup>1</sup> 5 MΩ <sup>2</sup>
Additional error	
Burden influence	< 0.2% (at 500 Ω)
Temperature coefficient	< 50 ppm/K

**Ambient conditions**

Climatic rating	Climate class 3Z accuracy 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	50g, 10 shocks in each of 3 directions

<sup>1</sup>with current signal  
<sup>2</sup>with voltage signal

### 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

### Installation data

Mechanical design	Carrying rail housing N12 Dimensions see section " Dimensional drawing "
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 - G 32 OR — onto top - hat rail acc. to EN 50 022 - 35 X 7.5
Mounting position	Any
Electrical connections	Screw terminals with wire protection clamps — for 0.2 to 4 mm <sup>2</sup> non - standard wires OR — for 0.2 to 2.5 mm <sup>2</sup> standard wires
Weight	Approx. 35 g

### Electrical connections



Fig. 4

Standard accessories  
1 Operating instructions

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

### Dimensional drawings

(All dimension are in mm)

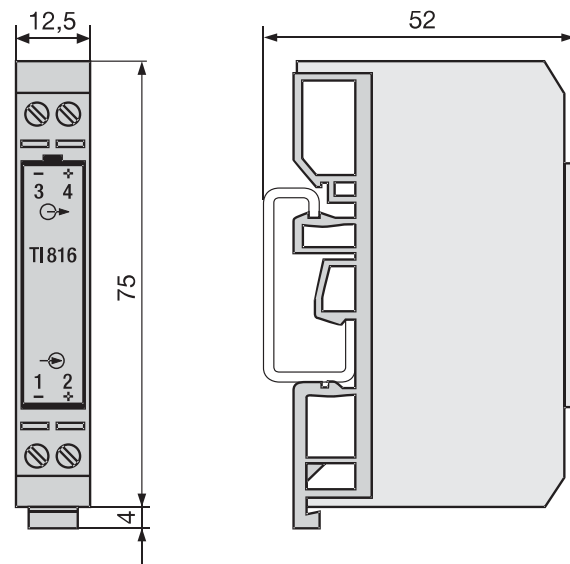


Fig 4 .TI 816 in carrying rail housing N12 on G-Type rail EN 50 035 - G 32

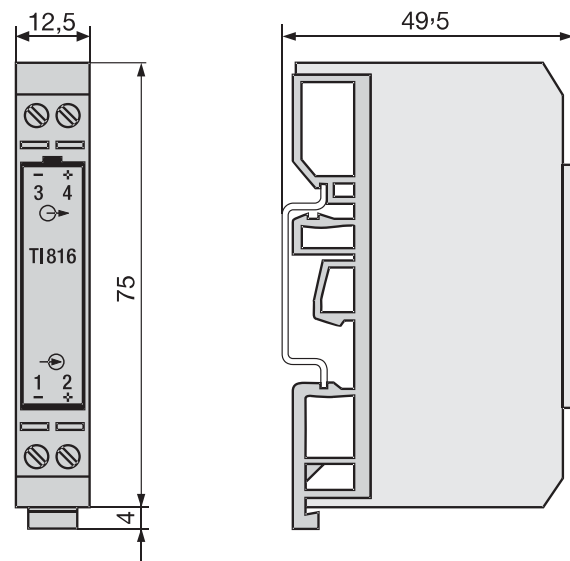


Fig. 6 TI 816 in carrying rail housing N12 on top - hat rail EN 50 022 - 35 X 7.5

### Table 2: Versions (stock)

There are two versions of the DC signal isolator TI 816

Description	Output signal A
Passive DC signal isolator Input signal E : 0...20 mA, with 1 isolation and transmission channel, in carrying rail housing N12	0...20 mA
	0...10 V

### Standard Accessories

1. Operating Instruction
2. Test certificates