

RISH Ducer TI 807

Passive DC signal isolator

Data Sheet

DC Signal Isolator



Fig.1

Application

The signal isolator **RISH Ducer** TI 807 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.

Features / Benefits

- Electrically insulated analogue DC signals 0...20mA / 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.
- Snaps onto a DIN rail or screws onto a wall or panel / adaptable to the circumstances at the place of installation
- Compact and narrow, Housing only 17.5 mm wide / Low space requirement, high packing density. 27 devices fit into a 19" rack

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 $E = 0...20 \text{ mA}$ to an AC signal which is transformed with electrical insulation, rectified, smoothed and appears at the output as a DC current signal $A = 0...20 \text{ mA}$ (Fig. 2, left). Versions with a DC output voltage.

Signal $A = 0...10 \text{ V}$ have a resistive burden of 500 through which the current flows (Fig. 2, right).

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

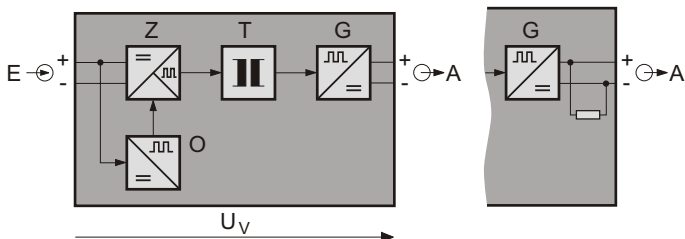


Fig. 2. Block diagram for a function unit.

Technical data

Input signal E

DC current signal I_E 0(4)...20 mA
 Max. permissible current 50 mA
 Voltage limiter Non-Ex version: 27 V \pm 5% (with zener diode)

Output signal A

(DC current or DC voltage)
 DC current signal I_A 0(4)...20 mA

Voltage drop U_v

< 2.8 V	with standard (non-Ex) version
---------	--------------------------------

Max. burden:

1000 Ω	with standard (non-Ex) version
---------------	--------------------------------

Limit Approx. 40 mA
 Residual ripple < 20 mV ss
 Time constant Approx. 3 ms
 Response time¹ Approx. 15 ms
 acc. to IEC 770
 DC voltage signal U_A 0(2)...10 V

Voltage drop U_v

< 2.8 V	with standard (non-Ex) version
---------	--------------------------------

Internal resistance 500 Ω

Limit

< 26 V	with standard (non-Ex) version
--------	--------------------------------

Residual ripple < 20 mV ss
 Time constant Approx. 3 ms
 Response time¹ Approx. 15 ms
 acc. to IEC 770

Accuracy data

Error limits $\leq \pm 0.1\%$
 (Reference value 20 mA of output signal, typical linearity error included)
 $\leq \pm 0.2\%$ (Reference value 10 V of output signal, typical linearity error included)

Reference conditions

DC current signal I_E 0(4)... 20 mA
 Ambient temperature 23 °C \pm 1 K
 Output burden 250 Ω
 (at DC current output signal)
 < 5 M Ω
 (at DC voltage output signal)

Additional error

Burden influence < 0.05% / 100W
 (at DC current output signal)
 Temperature coefficient < 50 ppm/K

Ambient conditions

Climatic rating Climate class 3Z acc. to VDI/VDE 3540
 Operating temperature — 25 to + 55 °C
 Storage temperature — 40 to + 70 °C
 Annual mean relative humidity $\leq 75\%$ standard climatic rating
 $\leq 95\%$ improved climatic rating
 Seismic test 5 g, < 200 Hz,
 2 h in each of 3 directions
 Shock 50 g,
 10 shocks in each of 3 directions

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 : $\pm 8 \text{ kV}$ air Indirect : $\pm 6 \text{ kV}$ contact
HF field influence on instrument	IEC 1000-4-3	80 MHz... 1000MHz: 10 V/m, 80% AM 1kHz (ITU-frequencies, 3V/m)
Transient burst via connections	IEC 1000-4-4	$\pm 2 \text{ kV}$, 5/50 ns, 5kHz, > 1 min. Capacitively coupled
HF interference via connections	IEC 1000-4-6	0.15 to 230 MHz: 10 V, 80% AM 1kHz (ITU-frequencies, 3V)

The device fulfills the protection requirements of the EMC guidelines (89/336/EWG).

Regulations

Test voltage kV, 50 Hz, 1 min

2.3 kV	TI 807.... (housing S17)	For 1 channel : Input versus Output For 2 or 3 channel : Input versus Input Output versus Output
--------	--------------------------	--

Surge voltage kV, 1.2/50 ms

4.25 kV	TI 807.... (housing S17)	For 1 channel : Input versus Output For 2 or 3 channel : Input versus Input Output versus Output
---------	--------------------------	--

Installation data

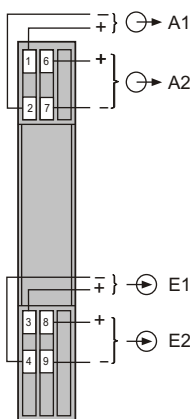
Mechanical design	Housing S17 Dimensions see section "Dimensional Drawings"
Material of housing	Lexan 940 (polycarbonate) Flammability class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen
Mounting	directly onto a wall with 2 screws and pull-out screw hole brackets
Electromagnetic compatibility	The standards DIN EN 50 081 - 2 and DIN EN 50 082 - 2 are observed
Electrical design	Acc. to IEC 1010 resp. EN 61 010
Contamination level	2
Over voltage category	II
Protection (acc. to IEC 529 resp. EN 60529)	Housing IP 40 Terminals IP 20
Mounting position	Any
Electrical connections	Screw terminals with wire guards for light PVC wiring and Max. 2 X 0.75 mm ² or 1 X 2.5 mm ²

Weight

approx. 180 g	TI 807 - 1.... (housing S17) with 2 isolation and transmission channels
approx. 200 g	TI 807 - 1.... (housing S17) with 3 isolation and transmission channels

Electrical Connections

(All dimension are in mm)



Signal isolator in housing in housing S17 with two/three isolation and transmission channels

Fig. 3.
RISH Ducer TI 807-112.
standard version

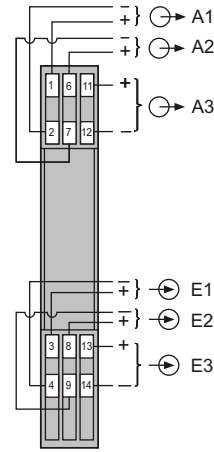


Fig. 4.
RISH Ducer TI 807-113.
standard version

Dimensional Drawing

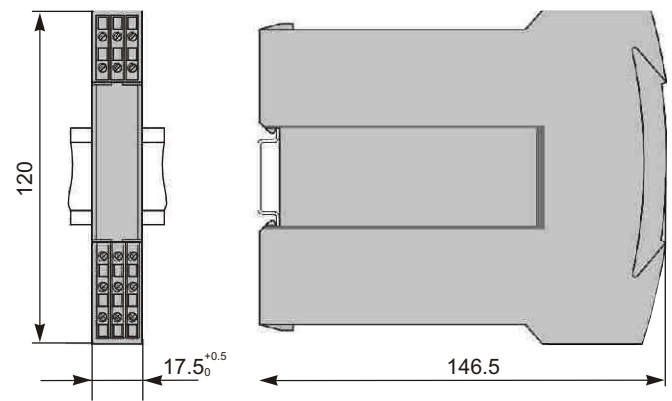


Fig. 5 RISH Ducer TI 8072-1 (Housing S17) clipped on to a top-hat Rail (35 X 7.5 or 35 X 15 mm, acc. to EN 50 022)

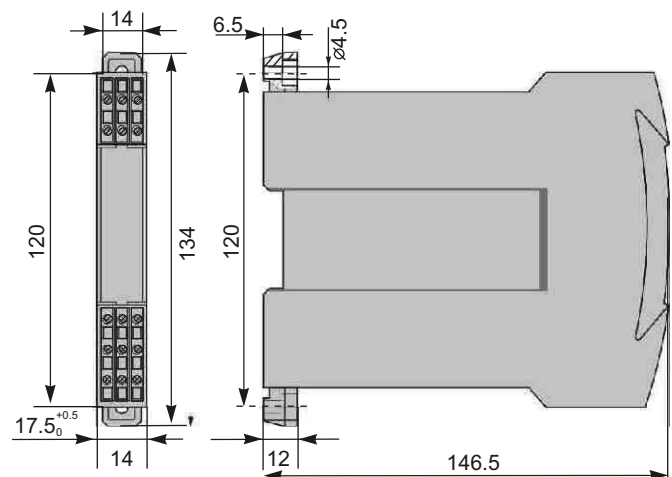


Fig. 6. RISH Ducer TI 807-1.... (housing S17) screw hole mounting. brackets pulled out.

Standard version in housing S17 for wall mounting

The following signal isolator versions are available as standard versions.

Table 2:

Description	Number of channels	Output channels
Passive DC signal isolator, standard version, input signal 0...20mA, standard climatic rating	2 channel	0...20 mA
	3 channel	0...20 mA
	2 channel	0...10 V
	3 channel	0...10 V

Standard accessories

- Operating instructions
- Pull out clamp S17 (for opening the house)
- Front label.

Table 7: Specification and ordering information

Order Code 807 —			
Features, Selection	*SCODE	no-go	
1. Mechanical design 1) Housing S17	B		↑ ↑ ↑ ↑ 1
2. Version 1) Standard (non-Ex) Input and output signals non intrinsically safe			. 1
3. Number of isolation channels 1) 2 channel (interface)		C	. . 2
2) 3 channels (interfaces)		C	. . 3
4. Output signals A1 or A2 and or A1 and A2 0) 0 ... 20 mA			. . . 0
2) 0 ... 10 V, 2 channels			. . . 2
3) 0 ... 10 V, 3 channels			. . . 3
5. Climatic rating 0) Standard climatic rating		 0

* Lines with letter(s) under “no-go” cannot be combined with preceding lines having the same letter under “SCODE”.



RISHABH INSTRUMENTS
Measure, Control & Record with a Difference

RISHABH INSTRUMENTS PVT.LTD.
F-31, MIDC, Satpur, Nashik-422 007, India.
Tel.: +91 253 2202160, 2202202 Fax : +91 253 2351064
E-mail : India :- marketing@rishabh.co.in
International :- exp.marketing@rishabh.co.in
www.rishabh.co.in