

Operating Manual

Theta 50



Operating Instructions

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1. Read first and then



The proper and safe operation of the device assumes that the Operating Instructions are **read** and the **safety** warnings given in the various sections are observed.



7. Mounting
8. Electrical Connections
9. Commissioning

The device should only be handled by appropriately trained personnel who are familiar within and authorised to work in electrical installations.

2. Scope of supply (Fig. 1)

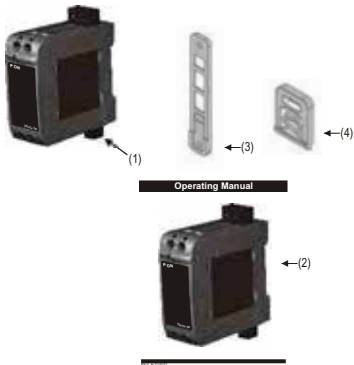


Fig. 1

Signal Isolator	(1)
Operating Instructions	(2)
Wall mounting holder	(3)
Clamp strap	(4)

3. Ordering Information-

Product Name - Input range code- Output 1 range code - Output 2 Range Code

1. Product Name - SI - 102
2. Standard input range codes:-

Current (mA)	Ordering Code	Voltage (V)	Ordering Code
0.....20	1	0.....10	4
1.....5	2	2.....10	5
4.....20	3	1.....5	6

3. Standard output 1 & output 2 range codes:-

Current (mA)	Ordering Code	Voltage (V)	Ordering Code
0.....20	1	0.....10	3
4.....20	2	2.....10	4

4. Auxiliary supply voltage

Auxiliary supply voltage	Order code
60....300V AC/DC	H
20....40V AC / 20...60V DC	L

Example:-

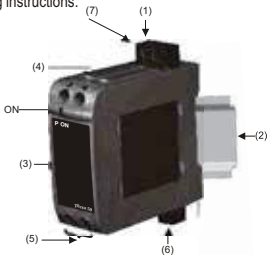
To order model with 0 to 20 mA input, 0 to 10V output1 & 4 to 20mA output2 and aux supply 20....40V AC / 20...60V DC ordering information will be as follow: -SI-102-1-3-2-L

4. Brief description

The purpose of the isolating amplifier is to electrically insulate input and output signals, respectively to amplify and/or change the signal level or type (current or voltage) of the input signals.

5. Overview of the parts

Figure 2 shows those parts of the device of consequence for mounting, electrical connections and other operations described in the Operating instructions.



- (1) Fixing Bracket
- (2) Top-hat rail
- (3) Front sticker
- (4) Terminal
- (5) Aux Input Terminal
- (6) Terminal
- (7) Terminal

ON Green LED for Power ON indication.

6. Technical Data

Measuring Input $\ominus \rightarrow$

DC Current :

Standard ranges :
1) 0 - 20 mA
2) 4 - 20 mA
3) 1 - 5 mA

DC Voltage :

Standard ranges:
1) 0 - 10 V
2) 2 - 10 V
3) 1 - 5 V
 $R_i \leq 15.5\Omega$
 $R_i \geq 100K\Omega$

Measuring outputs 1 & 2 $\ominus \rightarrow$

DC Current : 1) 0 - 20mA

Standard ranges 2) 4 - 20 mA

Burden Voltage : 12 V

External resistance : $R_{ext} \text{ max. (K}\Omega) = \frac{12 \text{ V}}{I_{AN} \text{ (mA)}}$
 $I_{AN} = \text{output circuit full-scale value}$

DC Voltage :

Standard ranges
1) 0 - 10V
2) 2 - 10 V

Burden : $R_{ext} \text{ min. (K}\Omega) \geq \frac{U_{AN} \text{ [V]}}{5\text{mA}}$
 $U_{AN} = \text{output circuit full-scale value}$

Residual ripple in Output: < 0.5% p.p.

Response time: < 50 ms

Current limiter at $R_{ext}=0$: Approx. 40 mA for voltage output

Voltage limiter at $R_{ext}=\infty$: Approx 18V for Current output

Power supply H

Rated operating Voltage: 60 to 300 V AC/DC
20 to 40 VAC / 20 to 60 VDC

Rated operating frequency: 40 to 400 Hz

Power input : ≤ 2 W resp. ≤ 4.0 VA

Accuracy data (acc. to IEC 60770)

Basic accuracy : Limit error $\leq \pm 0.2\%$
Including linearity and
reproducibility errors

Reference conditions

Ambient temperature $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$
Output burden Current: $0.5 \cdot R_{ext} \text{ max.}$
Voltage: $2 \cdot R_{ext} \text{ min.}$

Influencing Factors:

Temperature $< \pm 0.15\%$ per 10°C
Burden influence $< \pm 0.1\%$
Longtime drift $< \pm 0.3\%$ / 12 months
Switch- on drift $< \pm 0.2\%$

Installation Data:

Mechanical Lexan 940 (polycarbonate)
Housing Flammability Class V-0 acc. To UL
94 self extinguishing, non dripping,
free of halogen.

Mounting position Rail mounting / wall mounting

Weight Approx. 0.2 kg

Connection Terminal:

Connection Element : Conventional Screw type terminal with indirect wire pressure

Permissible cross section of the connection lead $\leq 4.0 \text{ mm}^2$ single wire or $2 \times 2.5 \text{ mm}^2$ fine wire

Permissible Vibrations : 2 g acc. to EN 60 068-2-6

Shocks : 3 x 50 g
2 shocks each in 6 directions
Acc. to EN 60 068-2-27

Electrical : All circuits (measuring inputs/ insulation measuring outputs/power supply) are electrically insulated

Regulation

Electromagnetic : Compatibility Acc. to IEC 61326-1

Protection class: II (Protection isolated EN 61010)

Protection : For Housing : IP 40
For Terminals : IP 20

Pollution degree: 2

Electrical standards : Acc. to IEC 61010-1 resp. EN 61010-1

Test voltage : Power supply versus :
- all 3.0 kV, 50 Hz, 1 min.
Measuring inputs versus :
- measuring outputs 2.3 kV,
50 Hz, 1 min. & O/P1 to O/P 2:
500 V ,50 Hz , 1 min

Environmental conditions

Climatic rating : Climate class 3Z acc. to
VDI/VDE 3540

Operating temperature -10...55°C

Storage temperature -40...70°C

Annual mean $\leq 75\%$

Relative humidity

Altitude up to 2000 m

7. Mounting

The Isolator can be mounted either on a top-hat rail or directly onto a wall or mounting plate.



Make sure that the ambient temperature stays within the permissible limits :
-10 and 55°C



Fig. 3 Top-hat rail Mounting



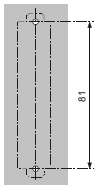
Fig. 4 Wall Mounting

As the front of the enclosure conforms to IP 40. The terminals of the product should be protected from liquids. Transducer should be mounted in a reasonably stable ambient temperature and where the operating temperature is within the range - 10 to 55°C .Vibration

should be kept to a minimum and the product should not be mounted where it will be subjected to excessive direct sunlight.

Caution

1. In the interest of safety and functionality this product must be installed by a qualified engineer, abiding by any local regulations.
2. Voltages dangerous to human life are present at some of the terminal connections of this unit. Ensure that all supplies are de-energised before attempting any connection or disconnection.
3. These products do not have internal fuses therefore external fuses must be used to ensure safety under fault conditions.



Drill 2 holes in the wall or panel as shown in the drilling pattern (Fig. 5). Now secure the power pack to the wall or panel using two 4 mm diameter screws.

Fig. 5. Drilling plan

8. Electrical connections

Input connections are made directly to screw-type terminals with indirect wire pressure. Choice of cable should meet local regulations. Terminal for Current inputs will accept up to $\leq 4.0 \text{ mm}^2$ single wire or $2 \times 2.5 \text{ mm}^2$ fine wire.



Make sure that the cables are not live when making the connections !

The 230 V power supply is potentially dangerous !



Note that, ...

...the data required to perform the electrical insulation task agree with the data on the nameplate of the Isolator (⊖ input E, ⊕ output A1 & A2 and →○ power supply H !)

...the total loop resistance connected to the output (receiver plus leads) does not exceed the maximum permissible value $R_{ext} \text{ max}$. See "Measuring Output" in sec. "6. Technical data" for the maximum values of R_{ext} !

...the input and output cables should be twisted pairs and run as far as possible away from heavy current cables !

In all other respects, observe all local regulations when selecting the type of electrical cable and installing them !

Connection	Terminal details	
Measuring input	+	3
	-	4
Auxilliary Power supply	~ , +	1
	~ , -	2
Measuring output 1	+	5
	-	6
Measuring output 2	+	7
	-	8

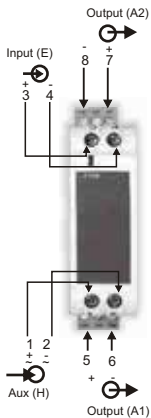
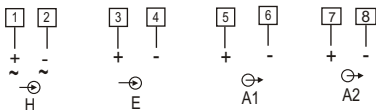


Fig.6 Front View of Device for electrical Connections



E = Input

H = Power supply

A1 = Output 1

A2 = Output 2

9. Commissioning

Switch on the measuring inputs and the power supply. The green LED lights continuously after switching on.



The power supply unit must be capable of supplying a brief current surge when switching on. The instrument presents a low impedance at the instant of switching ON which requires a current I_{start} of ≥ 35 mA

10. Maintenance

No maintenance is required.

11. Dimensional drawings

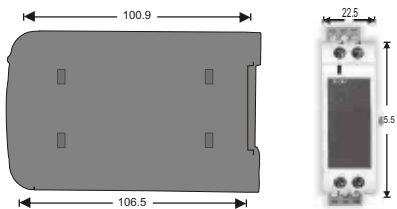


Fig. 7. Side View & Front view