



# Technical Data Sheet

## *Theta 60I Series*



The purpose of the isolating amplifier 808 (fig.1) 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.

## Application

The purpose of the isolating amplifier 808 (fig.1) 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.

The amplifier fulfils all the important requirements and regulations concerning electromagnetic compatibility EMC and safety (IEC 1010 resp. EN 61 010). It was developed and is manufactured and tested in strict accordance with the quality assurance standard ISO 9001.

The device have one/two channels and provides one/two independent isolating amplifiers in an extremely small space. The user has a wide Choice of input and output ranges and can set the Desired one with the aid of soldered jumpers (coarse adjustment) and potentiometers (fine adjustment)

A Version with one input and two outputs is available that enables two electrically insulated output to be obtained from a single input signal.

- 252 standard input and output combinations selected by soldered jumpers
- User-specific input and / or output ranges
- Isolating amplifier with one input one or two electrically insulated outputs.
- Power supply 24...60VDC/ AC or 85...230VDC / AC
- Electric Isolation between input, output and power supply, prevents falsified measurement due to spurious potentials.
- Flexibility provided by more than 250 different input and output combinations selected by simply positioning soldered jumpers, help in reduced stocking.
- Processes unipolar/ bipolar and live zero signals provision for raising burden and signal conversion Green LED signals indicates device in operating condition.
- High Electrical Insulation between input and output - 2.3KV, and power supply versus all Other Circuits-3.7 KV
- Provision for either snapping the isolating amplifier on to top-hat rails or securing it with screw to a wall or panel.

## Technical Data

### Measuring Inputs

DC Current

0... 0.1 mA	0.2... 1mA	- 0.1... + 0.1 mA
0... 0.2 mA	1... 5mA	- 0.2... + 0.2 mA
0... 0.5 mA	2... 10mA	- 0.5... + 0.5 mA
0... 1 mA	4... 20mA	- 1... + 1 mA
0... 2 mA		- 2... + 2 mA
0... 5 mA		- 5... + 5 mA
0... 10 mA		- 10... + 10 mA
0... 20 mA		- 20... + 20 mA

### Limit Values

0...0.1 to 0...40mA also live - Zero,

Start value > 0 to < 50% Final value

Or span 0.1 to 40 mA

Between -40 and 40mA

Also bipolar as ymm etrical

R=15 Ω

## DC Voltage

Standard Ranges		
0... 0.06 V	0.2... 1 V	- 0.1... + 0.1 V
0... 0.1 V	1... 5 V	- 0.2... + 0.2 V
0... 0.2 V	2... 10 V	- 0.5... + 0.5 V
0... 0.5 V	4... 20 V	- 1... + 1 V
0... 1 V		- 2... + 2 V
0... 2 V		- 5... + 5 V
0... 5 V		- 10... + 10 V
0... 10 V		- 20... + 20 V
0... 20 V		
0... 40 V		

### Limit Values

0...0.06 to 0...40  
 also live - Zero,  
 Start value > 0 to ≤ 50% Final value  
 Or span 0.06 to 40 V  
 Between -40 and 40 V  
 Also bipolar as symmetrical  
 R=100 Ω

Non Standard input ranges	0...1000V DC input signal
Overload	DC current continuously 2 - fold DC voltage continuously 2 - fold

## Measuring outputs

DC Currents	Standard ranges 0...20mA, 4...20mA, + 20 mA Limit Values 0...1 to 0...20 mA 0.2...1 to 4...20mA -1...0...+1 to -20 ... 0... +20mA
Burden voltage	12V
External resistance	R <sub>ext</sub> max. [kΩ] >(U <sub>an</sub> [V])  /5mA U <sub>AN</sub> = Output circuit
Current limiter at R <sub>ext</sub> max	Approx 1.1 ×   <sub>an</sub> for current output
Voltage limiter at R <sub>ext</sub> = 00	Approx 13V
Residual ripple in output current	< 0.5 % p.p
Response time	<50 ms

### Accuracy Data (acc. To DIN/IEC 770)

Basic accuracy	Limit error + 0.2% including linearity and reproducibility errors
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## Reference Condition

Ambient temperature	23 C+2K
Power Supply	24 V DC + 10% & 230 V AC + 10%
Output burden	Current : 0.5 R <sub>ext</sub> min Voltage: 2 R <sub>ext</sub> min.

## Influencing Factors

Temperature Burden influence	$< \pm 0.1\%$ per 10K $< \pm 0.1\%$ for Current output $< 0.2\%$ for Voltage output if $R_{ext} < 2 \cdot R_{ext min}$
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For power supplies  $> 125\text{ V}$  the auxiliary circuit should include an external use with a rating  $< 20\text{ ADC}$

Longtime drift	$< \pm 0.3\%$ / 12 months
Switch on drift common and Transverse	$< \pm 0.2\%$
Mode Influence	$< \pm 0.2\%$
Output + or - connected to ground	$< \pm 0.2\%$

## Power Supply H

AC/DC Power pack (DC and 45...400 HZ)  
 Table 3 nominal voltage and tolerance

Nominal Voltage $U_N$	Tolerance
24... 60 V DC / AC	DC -15 ... + 33% AC + 15%
85 ... 230 V1 DC / AC	
Power Input	$< 1.6\text{ W}$ resp $< 3.4\text{ VA}$

## Environmental Conditions

Climatic rating	Climate class 3Z acc. To VDI/VDE 3540
Commissioning Temperature	-10 to 55 °C
Operating Temperature	-25 to 55 °C
Storage Temperature	- 40 to 70 °C

Annual mean relative humidity	$< 75\%$
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## Standard

Electromagnetic Compatibility	The standards DIN EN 50 081-2 & DIN EN 50 082-2 are observed
Protection (acc. To IEC 529 resp. EN 60 529)	Housing IP 40 Terminals IP 20
Electrical Standards operating Voltage	Acc to IEC 1010 resp. En61010 $< 300\text{ V}$ between all insulated circuits
Contamination Level	2
Over Voltage category	for Power supply
Acc to IEC 664	for measuring output
Double insulation	Power Supply Versus all other circuits Measuring Input versus measuring output
Test Voltage	Power supply versus: - all 3.7 kV, 50Hz, 1min Measuring input Versus -measuring output 2.3 kV, 50Hz 1min Measuring input1 Versus -measuring input 2 2.3 kV, 50Hz 1min Measuring input1 Versus -measuring output 2 2.3 kV, 50Hz 1min

## Regulations

Electromagnetic Compatibility	The Standards DIN EN 50 081 -2 & DIN EN 50 082-2 are observed
Protection (acc. To IEC 529 resp. EN60 529)	Housing IP 40 Terminal IP 20
Electrical standards	Acc. To IEC 1010 resp. En 61010
Operating voltages	< 300 V between all insulated circuits
Contamination Level	2

## Installation Data

Housing	Housing S 17 See Section "Dimensional Drawing" for dimensions
Material of Housing	Lexan 940 (polycarbonate) Flammability class v-0 acc to UL 94, self-extinguishing, non-dripping free of halogen
Mounting	For snapping onto top - hat rail (35*15mm or 35*7.5mm) acc to EN 50 022 or Directly on to a wall or panel using the pull-Out screw hole brackets
Position of use	Any
Terminal	DIN/VDE 0609 Screw Terminal with wire guards, for light PVC wiring and max 2× 0.75mm <sup>2</sup> or 1×2.5mm <sup>2</sup>
Permissible vibrations	2g acc. To EN 60 068-2-6

Shock	3×50 g 3 Shock each in 6 Direction acc to EN 60 068 -2-27
Weight	Approx 0.2 kg
Electrical insulation	All circuit (measuring input/measuring outputs / power supply) are electrically insulated

## Configuration

### 1. Standard input ranges

Soldered jumpers are provided for the coarse setting of the input ranges and the fine adjustment is accomplished using the potentiometers "Zero" and "span" 100 must be added to the designation of the soldered jumpers in the table for channel 1 and 200 for channel 2.

(Example : input range for input 1 and input 2= 0... 20mA jumpers 1,5,6 and 11 must be inserted for this range

- The corresponding jumpers for channels 1 are B 101, B 101, B 105, B 106 and B 111.
- The corresponding jumpers for channels 2 are B 201, B 201, B 205, B 206 and B 211.

Current [mA]	Soldered Jumpers			Voltage [V]	Soldered Jumpers		
0... 0.1	1,3	7,10,11		0... 0.6		6,9,10,11	
0... 0.2	1,3	8,11		0... 0.1		7,8,10,11	
0... 0.5	1,4	9,10,11		0... 0.2		6,8,9,11	
0... 1	1,4	7,10,11		0... 0.5		6,7,8,9,10	
0... 2	1,4	8,11		0... 1		6,7,8,10,11	
0... 5	1,5	6,7,8,10,11		0... 2		7,8,9,11	
0... 10	1,5	10,11		0... 5	2	8,10	
0... 20	1,5	6,11		0... 10	2	10,11	
				0... 20	2	6,11	
0.2... 1	1,4	8,10,11	12,15	0... 40	1	8	
1... 5	1,4	6,9	12,15		1	9,10,11	12,15
2... 10	1,5	6,7,10,11	12,15	0.2... 1	1	6,8,9,10	12,15
4... 20	1,5	6,7,8,11	12,15	1... 5	2	6,7,10,11	12,15
				2... 10	2	6,7,8,11	12,15
- 0.1... 0... + 0.1	1,3	8,11	13,14,16	4... 20	1	6,8,9,11	
- 0.2... 0... + 0.2	1,3	7,9	13,14,16		1	6,7,9,10	13,14,16
- 0.5... 0... + 0.5	1,4	7,10,11	13,14,16	- 0.1... 0... + 0.1		7,8,10,11	13,14,16
- 1... 0... + 1	1,4	8,11	13,14,16	- 0.2... 0... + 0.2	2	7,8,9,11	13,14,16
- 2... 0... + 2	1,4	6,9	13,14,16	- 0.5... 0... + 0.5	2	6,8,9,10	13,14,16
- 5... 0... + 5	1,5	10,11	13,14,16	- 1... 0... + 1	2	10,11	13,14,16
- 10... 0... + 10	1,5	6,11	13,14,16	- 2... 0... + 2	1	6,11	13,14,16
- 20... 0... + 20	1,5	6,7	13,14,16	- 5... 0... + 5	1	8	13,14,16
				- 10... 0... + 10	1		13,14,16

2. Standard input ranges

Soldered jumpers are provided for the coarse setting of the output ranges and the fine adjustment is accomplished using the potentiometers "zero" and "Span".

Current mA	Soldered Jumpers		Voltage V	Soldered Jumpers	
	Channel1	Channel2		Channel1	Channel2
0...20	B 120	B 220	0...10	B 120 B 122 B 123	B 220 B 222 B 223
4...20	B 121	B 221	2...10	B 121 B 122 B 123	B 221 B 222 B 223
+20	-	-	± 10	B 122 B 123	B 222 B 223

3. Specific User output ranges

Units that have been configured for a specific user output range cannot be subsequently reconfigured.

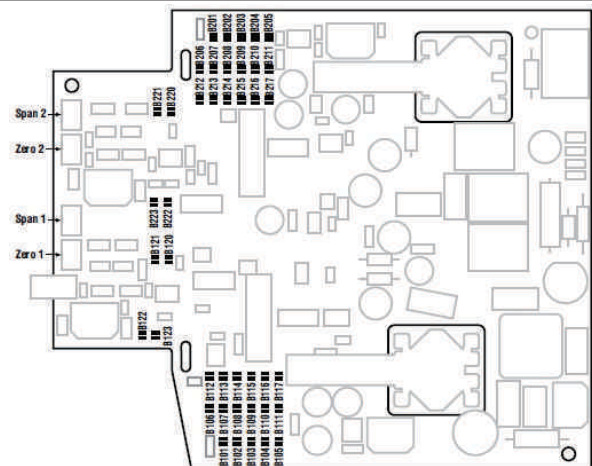
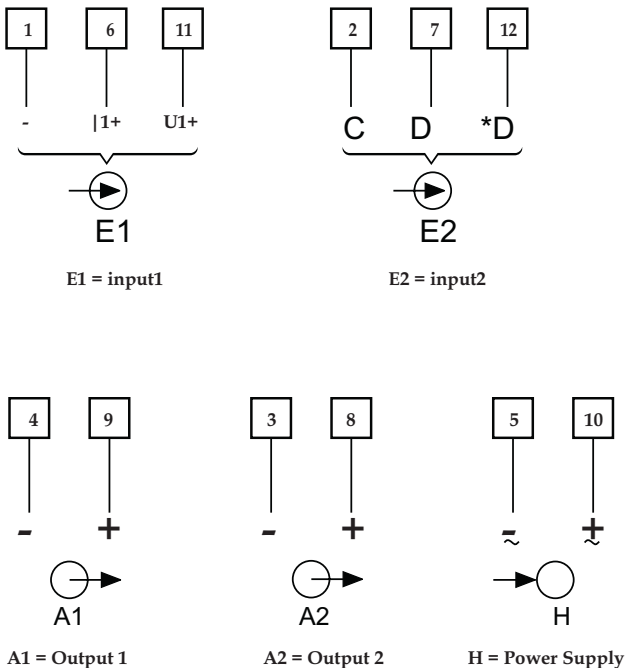
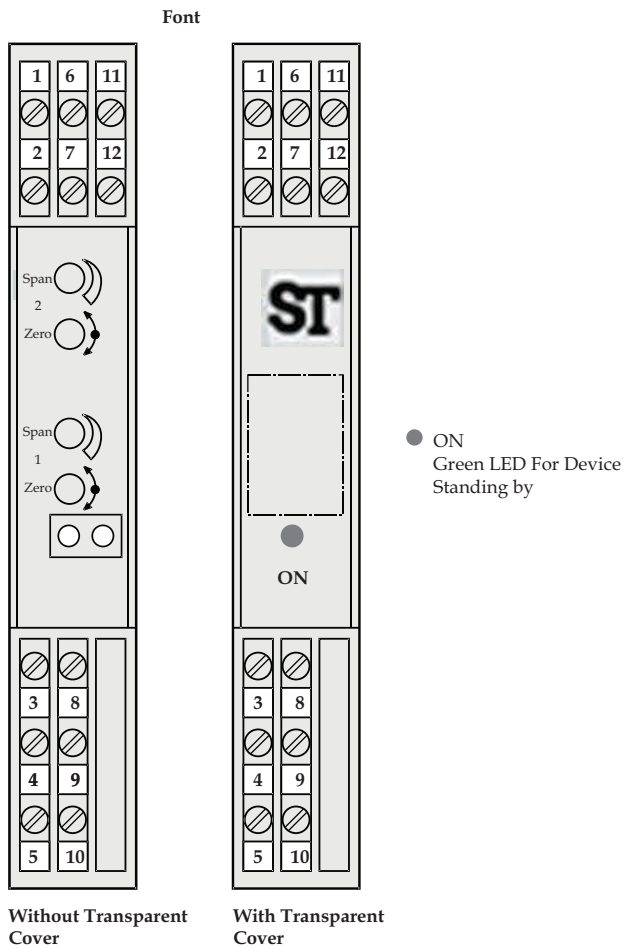
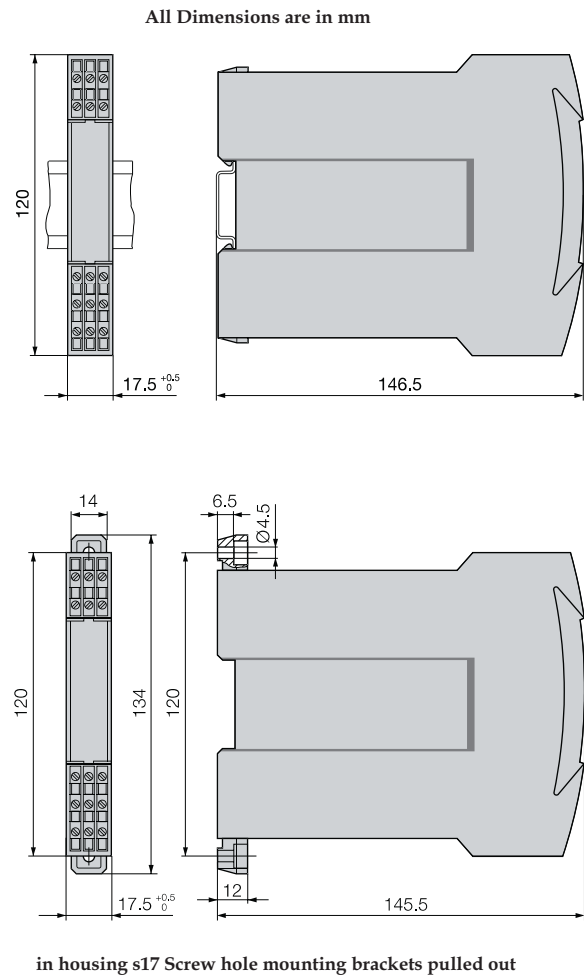


Fig. 3. Position of the soldered jumpers B... and the potentiometers "Span" and "Zero".

## Electrical Connections



## Electrical Connections



## Standard Version

Input and output set to 0...20mA any of the standard ranges given in the section "Technical data, measuring inputs" are simply selected by positioning soldered jumpers. The fine adjustment is accomplished using the potentiometers "zero" and "span"

