

Knick 

For transmission and conversion of impressed signals.

IsoAmp® 3000/4000



The DC isolation amplifiers of the IsoAmp® 3000/4000 series transmit and convert impressed 0(4) ... 20 mA or 0 ... 10 V standard signals according to our German patent DBP 34 12 843 with a high level of accuracy.

They provide Safe Isolation and high insulation from input to output to power supply.

The Advantages

The control range extends into the negative values and allows strict linear transmission in the zero range. Compared with conventional unipolar amplifiers, this has a great advantage: The often asymptotic setting of the zero point, for example, when calibrating with a sensor, is ruled out.

The transmission error is unusually low. The reason for this is mainly a negative feedback circuit that is incorporated in the electrical isolation. It has no sensing resistor with 1:1 transmission and just one sensing resistor for current/voltage conversion. Differentiated signal return allows the circuit to remain stable even with strong complex loads.

The components required in conventional concepts for matching amplifiers and resistor networks are omitted. The reliability is accordingly high.

The computer-aided production control and final inspection ensure high and constant quality. The full encapsulation guarantees maximum safety and reliability even in extreme conditions.

The Applications

The devices can be used for many galvanic isolation applications, for example:

- in measuring and control engineering
- for linking measurement signals to different potentials
- for removal of double ground compensation currents
- for isolation of dangerous touch voltages
- for computer interfacing
- for increase of load voltage and decoupled signal transmission

The DC isolation amplifier is available as a module for universal 24 V AC/DC current supply for use on printed circuit boards.

For Safe Isolation according to EN 61140, the required clearance and creepage distances should be taken into consideration.

The Models

IsoAmp® 3820

transforms the input current 1:1 into an impressed output current without negative feedback resistors by means of negative-feedback current transformation.

IsoAmp® 4820

converts the input current 2:1 into an impressed output voltage with just one precision resistor after current transformation.

IsoAmp® 3310

converts the input voltage 3:1 into an impressed output current with just one precision resistor after voltage transformation.

IsoAmp® 4310

converts the input voltage 1:1 into an impressed output voltage without negative-feedback resistors after voltage transformation.

Isolation Amplifiers for Standard Signals

Isolation Amplifiers
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings

Knick ➤

■ The Facts

Safe Isolation according to EN 61140

Protection of maintenance staff and subsequent devices against non-permitted high voltages

3-port isolation

Protection against incorrect measurements or damage to the equipment due to parasitic voltages

Decoupled

No load effect on the signal source

Maximum reliability

No maintenance work, therefore the related costs are not incurred

Full encapsulation

Reliable functioning also in aggressive atmospheres or with considerable mechanical loading, for example, due to vibrations

High accuracy

No distortion of measurement signal

Simple live zero/dead zero switching option

Multiple application possibilities due to optional switching of input or output 0 ... 20 mA, 4 ... 20 mA

5-year warranty

**Warranty
5 years!**

Defects occurring within 5 years from delivery are remedied free of charge at our works (carriage and insurance paid by sender).



IsoAmp® 3000/4000

■ Product Line

Devices	Order No.
IsoAmp® 3000/4000 Input: 0 ... 20 mA, output: 0 ... 20 mA Input: 0 ... 20 mA, output: 0 ... 10 V	3820 Mh 4820 Mh
IsoAmp® 3000/4000 Input: 0 ... 10 V, output: 0 ... 20 mA Input: 0 ... 10 V, output: 0 ... 10 V	3310 Mg 4310 Mg
Power supply	
24 V AC/DC	
Options	
Input 0 ... 20 mA or 4 ... 20 mA, switchable	250 ¹⁾
Output 0 ... 20 mA or 4 ... 20 mA, switchable	251 ¹⁾
Accessories	
Inspection Certificate 3.1 B according to EN 10204	ZU 0267
Inspection Certificate 3.1 B according to EN 10204, with description and results from inspections	ZU 0268

1) Options 250 and 251 cannot be combined; additional error at output: $\pm 10 \mu\text{A}$, with Model 4820: $\pm 10 \text{ mV}$

■ Selection Aid

		Output		
		0 ... 20 mA	0 ... 20 mA/ 4 ... 20 mA ²⁾	0 ... 10 V
Input	0 ... 20 mA	3820 Mh	3820 Mh Opt. 251	4820 Mh
	0 / 4 ... 20 mA ²⁾	3820 Mh Opt. 250	3820 Mh ³⁾	4820 Mh Opt. 250
	0 ... 10 V	3310 Mg	3310 Mg opt. 251	4310 Mg

2) Switchable

3) 1:1 transmission

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■ Specifications

Input data	3820 Mh	4820 Mh	3310 Mg	4310 Mg
Input ¹⁾	0 ... 20 mA impressed current Option 250: 0/4 ... 20 mA, switchable ²⁾		0 ... 10 V	
Input resistance	–		> 5 Mohms	> 2 Mohms
Input voltage drop	Approx. 100 mV With open output: approx. 750 mV Upon power failure: approx. 750 mV		Approx. 150 mV Upon power failure: approx. 750 mV	
Offset current ³⁾	–		< 500 nA ± 10 nA/K	< 1 µA ± 10 nA/K
Overload	≤ 300 mA Limited to 750 mV by diode		≤ 100 mA Limited to 13 V by suppressor diode	
Output data	3820 Mh	4820 Mh	3310 Mg	4310 Mg
Output ¹⁾	0 ... 20 mA, 14 V ⁴⁾ Option 251: 0/4 ... 20 mA selectable ²⁾	0 ... 10 V, 10 mA	0 ... 20 mA, 10 V Option 251: 0/4 ... 20 mA selectable ²⁾	0 ... 10 V, 20 mA
Offset	< 2 µA	< 2 mV	< 5 µA	< 2 mV
Residual ripple	< 10 mV _{pp}			
Transmission error	0.01 % meas. val.	0.1 % meas. val.	0.1 % meas. val.	0.02 % meas. val.
Cutoff frequency	5 kHz, –3 dB	10 kHz, –3 dB/ V _{out} ≤ 3 V _{pp} ; 3 kHz, –3 dB/ V _{out} ≤ 10 V _{pp}	10 kHz, –3 dB	10 kHz, –3 dB/ V _{out} ≤ 3 V _{pp} ; 3 kHz, –3 dB/ V _{out} ≤ 10 V _{pp}
Temperature coefficient ³⁾	< 10 nA/K	< 40 µV/K 0.0025 %/K m. val.	< 100 nA/K 0.0025 %/K m. val.	< 40 µV/K
Power supply				
Power supply	24 V AC/DC AC: –15 % +10 %, 48 ... 500 Hz, approx. 1.3 VA DC: –15 % +20%, approx. 0.6 VA			

1) Transmission of negative signals up to approx. –3 % full scale

2) Options 250 and 251 cannot be combined.

3) Reference temperature for TC specifications: 23 °C

4) Options 250 and 251: 12 V

IsoAmp® 3000/4000

Specifications (continued)

Isolation

Galvanic isolation	3-port isolation between input, output and power supply
Test voltage	4 kV AC (input / output / power supply)
Working voltages (basic insulation)	1000 V DC with overvoltage category II and pollution degree 3 according to EN 61010-1. For applications with high working voltages, you should ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.
Protection against electric shock	Safe Isolation according to EN 61140 by reinforced insulation in accordance with EN 61010-1. For applications with high working voltages, you should ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.

Standards and approvals

Surge withstand	5 kV, 1.2/50 µs according to IEC 255-4
EMC	European EMC regulations, 89/336/EEC directive ⁵⁾

Other data

Ambient temperature	Operation: –10 ... +70 °C Transport and storage: –30 ... +80 °C
Design	Height: Mg module (Models 3310/4310): 19 mm, Mh module (Models 3820/4820): 15.9 mm See dimension drawings for further measurements
Weight	Approx. 45 g

⁵⁾ Deviations are possible while there is interference

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■ Terminal Assignments for Options 250 and 251

Model	Option	Input ^{*)}	Output	Output connection	Jumper (output)
3820	250	0 ... 20 mA	0 ... 20 mA	2 – 4	3 – 4
		4 ... 20 mA	0 ... 20 mA	2 – 4	
3820	251	0 ... 20 mA	0 ... 20 mA	2 – 4	
		0 ... 20 mA	4 ... 20 mA	3 – 4	
4820	250	0 ... 20 mA	0 ... 10 V	2 – 4	3 – 4
		4 ... 20 mA	0 ... 10 V	2 – 4	
3310	251	0 ... 10 V	0 ... 20 mA	2 – 4	
		0 ... 10 V	4 ... 20 mA	3 – 4	

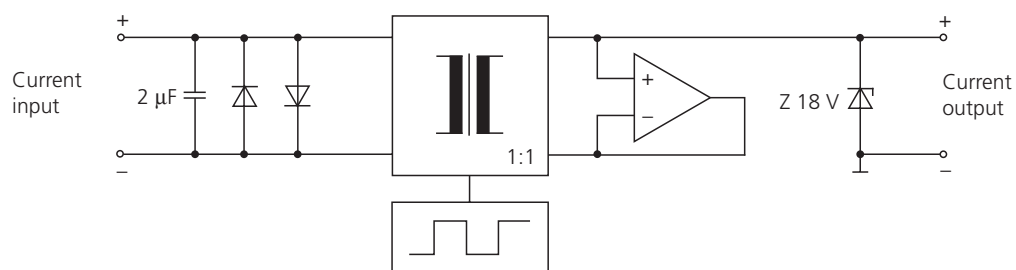
^{*)} See dimension drawing

Modules

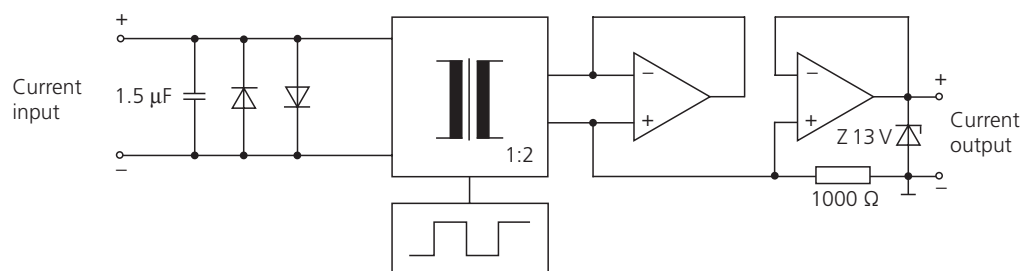
IsoAmp® 3000/4000

■ Block Diagrams

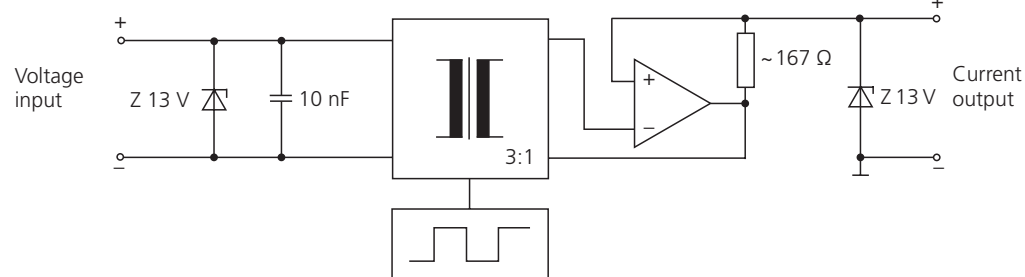
Model 3820



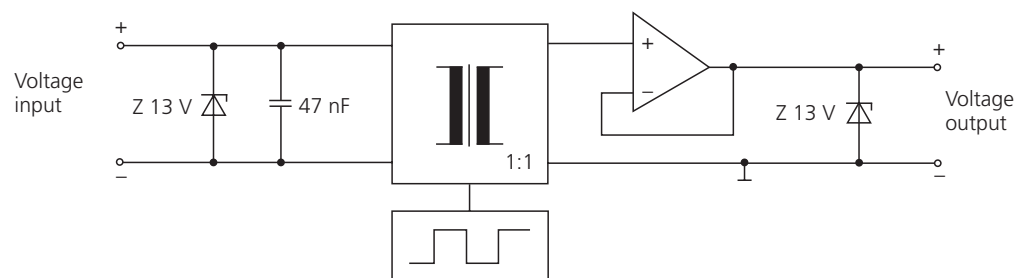
Model 4820



Model 3310



Model 4310

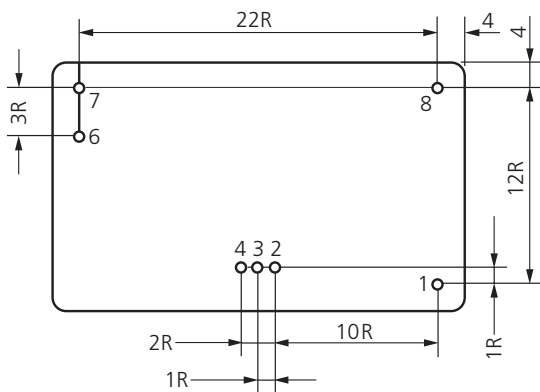


Isolation Amplifiers for Standard Signals

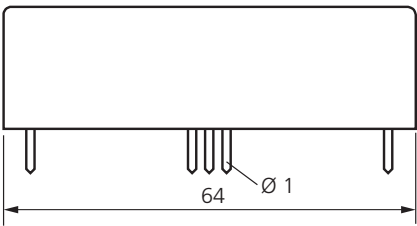
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■ Dimension Drawings and Pin Assignments

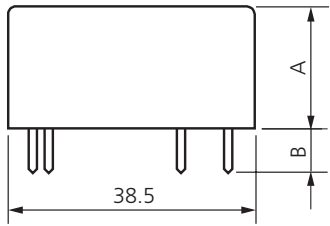


Pin View



- 1 Power supply +
 - 2 Output +
 - 3 Output +, Jumper
 - 4 Output -, Jumper
 - 6 Input -
 - 7 Input +
 - 8 Power supply -
- R = Spacing = 2.54

	Mg	Mh
A	19	15.9
B	appr. 6.8	appr. 9.8



All dimensions in mm!