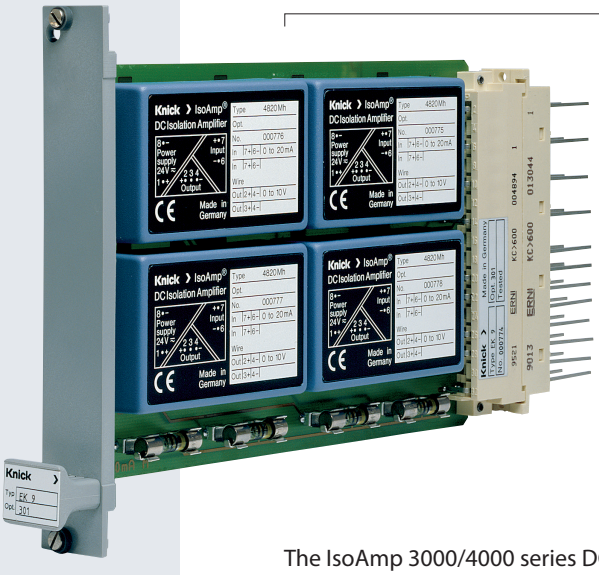
IsoAmp 3000/4000

For transmission and conversion of impressed measurement signals.



The IsoAmp 3000/4000 series DC isolation amplifiers transmit and convert 0(4) … 20 mA or 0 … 10 V standard signals with extreme precision according to our patent DBP 34 12 843.
They provide protective separation and high isolation between the input, output and power supply.

The Advantages
The dynamic range extends into the negative, allowing for strictly linear transmission in the vicinity of zero. This is a big advantage in comparison to typical unipolar amplifiers: The often asymptotic adjusting of the zero point, e.g. during calibration in connection with a sensor, is eliminated.
The transmission error is unusually low. The main reason for this is a negative feedback circuit which is integrated in the electrical isolation. With 1:1 transmission, this doesn't contain any sensing resistor, and only one sensing resistor for current/voltage conversion. Thanks to sophisticated signal feedback, the circuit remains stable even under highly complex loads.

The components typically required for modulation amplifiers and resistance networks are unnecessary. This results in correspondingly high reliability. A high and consistent level of quality is ensured by the computer-controlled production monitoring and final inspection system. The fully encapsulated design ensures the highest possible degree of safety and reliability even in extreme conditions.

The Applications
The devices can be used for a large variety of galvanic isolation tasks, e.g.
– in measurement and control systems
– for the connection of measurement signals which are at different potentials
– to eliminate currents resulting from double grounding
– for isolation of dangerous touch voltages
– for computer coupling
– for increase of load voltage and decoupled signal transmission

Each Eurocard can handle a maximum of four channels.
The 16 mm high channel housing even allows for an insertion width of just 4 HP. This means that 21 cards with 84 channels can be installed in a 19" rack.

The corresponding clearances and creepage distances must be ensured for protective separation according to EN 61140.

The Models

The IsoAmp 3820 transforms the input current 1:1 into an impressed output current without negative feedback resistors by means of negative-feedback current transformation.

The IsoAmp 4820 converts the input current 2:1 into an impressed output voltage with just one precision resistor after current transformation.

The IsoAmp 3310 converts the input voltage 3:1 into an impressed output current with just one precision resistor after voltage transformation.

The IsoAmp 4310 transfers the input voltage 1:1 into an impressed output voltage without negative feedback resistors after voltage transformation.

Facts

– **Protective separation according to EN 61140**
Protection of the maintenance staff and subsequent devices against excessively high voltages

– **3-port isolation**
Protection against incorrect measurements or damage to the equipment due to parasitic voltages

– **Decoupled**
The load has no effect on the signal source

– **Maximum reliability**
No maintenance work, therefore the related costs are not incurred

– **High accuracy**
No distortion of the measurement signal

– **Simple live-zero/dead-zero switching**
Versatile applications thanks to optional switching of input or output

– **5-year warranty**

Warranty
5 years!

Warranty
Defects occurring within 5 years from delivery date shall be remedied free of charge at our plant (carriage and insurance paid by sender).

IsoAmp 3000/4000

Product Line

Devices		Order No.
IsoAmp 3000/4000 Eurocards	Equipped with up to 3 channels	**EK 8 –**[1)2)]
	Equipped with up to 4 channels	**EK 9 –**[1)2)]
Channels for Eurocards	Input: 0 … 20 mA, output: 0 … 20 mA	**3820 Mh**
	Input: 0 … 20 mA, output: 0 … 10 V	**4820 Mh**
Channels for Eurocards	Input: 0 … 10 V, output: 0 … 20 mA	**3310 Mg**
	Input: 0 … 10 V, output: 0 … 10 V	**4310 Mg**

Power supply

24 V AC/DC

Options	Order No.
Input 0 … 20 mA or 4 … 20 mA, switchable	**250**[3)]
Output 0 … 20 mA or 4 … 20 mA, switchable	**251**[3)]
INTERMAS front panel, width 25 mm, for EK 8 or EK 9 Eurocard, mounted	**174**
INTERMAS front panel, width 20 mm, for EK 8 or EK 9 Eurocard, only if solely equipped with 3820 Mh and 4820 Mh	**301**

Accessories	Order No.
Inspection certificate 3.1 B according to EN 10204	**ZU 0267**
Inspection certificate 3.1 B according to EN 10204, with description and results of the tests performed	**ZU 0268**

[1)] Please indicate the required channel configuration when ordering. Any channel combinations available.
[2)] ±10 V or 20 V unipolar (note power supply!)
[3)] Options 04 and 185 cannot be combined.

Selection Aid

		Output		
		0 … 20 mA	0 … 20 mA/ 4 … 20 mA[4)]	0 … 10 V
Input	0 … 20 mA	3820 Mh	3820 Mh Opt. 251	4820 Mh
	0/4 … 20 mA[4)]	3820 Mh Opt. 250	3820 Mh[5)]	4820 Mh Opt. 250
	0 … 10 V	3310 Mg	3310 Mg Opt. 251	4310 Mg

[4)] Switchable
[5)] 1:1 transmission

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Specifications

Input data	3820 Mh	4820 Mh	3310 Mg	4310 Mg
Input[6]	0 … 20 mA impressed current Opt. 250: 0 / 4 … 20 mA switchable[7]		0 … 10 V	
Input voltage drop	approx. 100 mV, with open output: approx. 750 mV, with power failure: approx. 750 mV	approx. 150 mV with power failure: approx. 750 mV	–	
Input resistance	–		> 5 Mohms	> 2 Mohms
Offset current[8]	–		< 500 nA ±10 nA/K	< 1 µA ±10 nA/K
Overload capacity	≤ 300 mA limited to 750 mV by a diode		≤ 100 mA limited to 13 V by a suppressor diode	

Output data	3820 Mh	4820 Mh	3310 Mg	4310 Mg
Output[6]	0 … 20 mA, 14 V[9] Option 251: 0 / 4 … 20 mA switchable[7]	0 … 10 V, 10 mA	0 … 20 mA, 10 V Option 251: 0 / 4 … 20 mA switchable[7]	0 … 10 V, 20 mA
Residual ripple	< 10 mV_{pp}			
Transmission error	0.01 % meas. val.	0.1 % meas. val.	0.1 % meas. val.	0.02 % meas. val.
Offset	< 2 µA	< 2 mV	< 5 µA	< 2 mV
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[8]	< 10 nA/K	< 40 µV/K ±0,0025 %/K meas. val.	< 100 nA/K ±0,0025 %/K meas. 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

The 3000/4000 series isolation amplifiers are not intended for the end user, but solely for installation in another device within the framework of an industrial production process. They are not a product in the sense of the European EMC regulations. The requirements of the European EMC regulations with regard to the ready-to-use device must be observed by the planner or installer.

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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)	according to EN 61010-1

Type EK8	Overvoltage category / Permissible pollution degree	Permissible working voltage
Each input against all other circuits	II / degree 2 II / degree 3	1000 V DC 660 V DC / 630 V AC
Each output against all other circuits	I / degree 1 II / degree 2	1000 V DC 660 V AC/DC
Power supply against all other circuits	II / degree 1 III / degree 2	1000 V DC 600 V AC/DC

Type EK9	Overvoltage category / Permissible pollution degree	Permissible working voltage
Each input against all other circuits	II / degree 1 III / degree 2	1000 V DC 600 V AC/DC
Each output against all other circuits	I / degree 1 II / degree 1	1000 V DC 600 V AC/DC
Power supply against all other circuits	II / degree 1 II / degree 2	1000 V DC 600 V AC/DC

Permissible working voltages for other overvoltage categories and pollution degrees and for reinforced insulation / protective separation on request.
For applications with high working voltages, ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.

Protection against electric shock	Protective separation according to EN 61140 by reinforced insulation according to EN 61010-1. For applications with high working voltages, 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	according to directive 89/336/EEC and European EMC regulations[10)]

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Specifications (continued)

Further data		
Ambient temperature	Operation:	-10 … +70 °C
	Transport and storage:	-30 … +80 °C
Design	Eurocard	5 HP (Opt. 174) / 4 HP (Opt. 301)
Multipole connector	Type F according to DIN 41612, also refer to dimension drawings	
Socket connector[11)]	Type F according to DIN 41612 (wire-wrap connection), also refer to dimension drawings	
Front panel	Opt. 174: INTERMAS, SP / K3-n05T, plastic, gray, see also dimension drawings Opt. 301: INTERMAS, SP / K3-n04T, plastic, gray, also refer to dimension drawings	
Weight	approx. 60 g – 73 g per channel	

[6)] Transmission of negative measurement signals up to approx. –3 % full scale
[7)] The 250 and 251 options cannot be combined
[8)] Reference temperature for TC specifications: 23 °C
[9)] Opt. 250 and 251: 12V
[10)] Deviations are possible while there is interference
[11)] The socket connector is included in the scope of delivery

Terminal Assignments for Options 250 and 251

Model	**Option**	Input[*)]	Output	Output connection	Jumper (output)
3820	**250**	0 … 20 mA	0 … 20 mA	dz	
		4 … 20 mA	0 … 20 mA	dz	db
3820	**251**	0 … 20 mA	0 … 20 mA	dz	
		0 … 20 mA	4 … 20 mA	db	
4820	**250**	0 … 20 mA	0 … 10 V	dz	db
		4 … 20 mA	0 … 10 V	dz	
3310	**251**	0 … 10 V	0 … 20 mA	dz	
		0 … 10 V	4 … 20 mA	db	

[*)] See dimension drawing for connection

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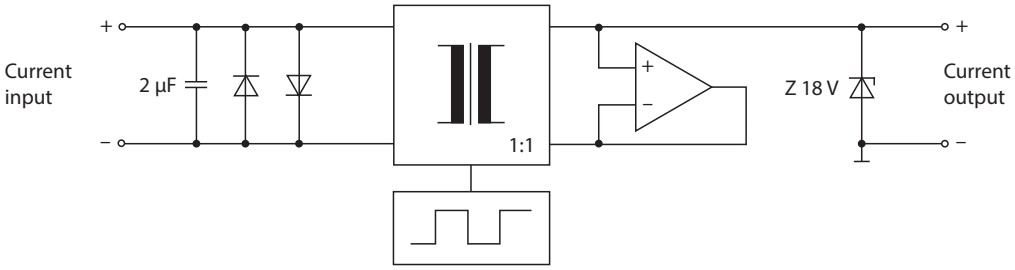
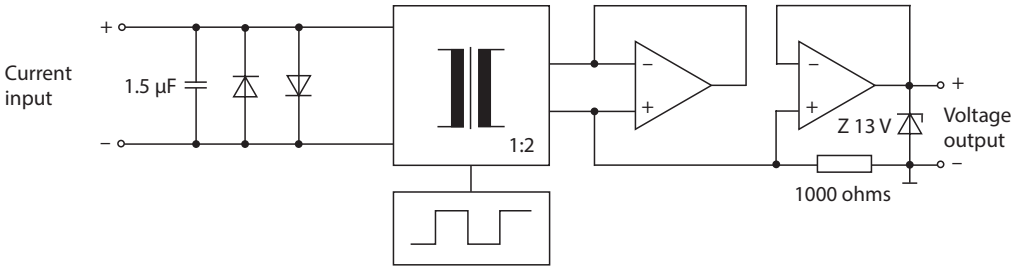
Block Diagrams

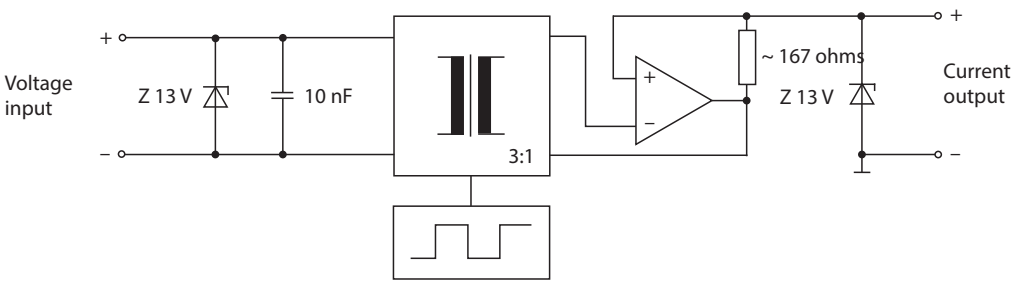
Model 3820



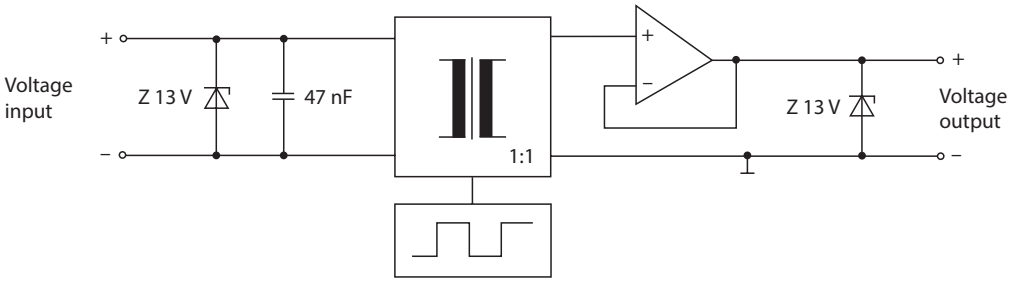
Model 4820



Model 3310

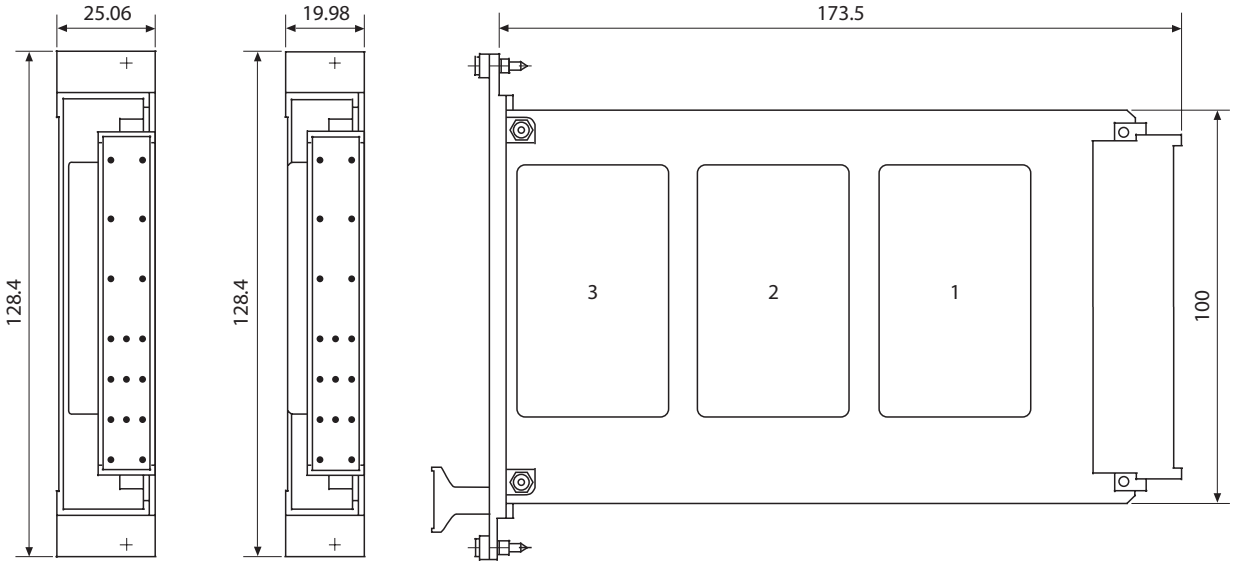


Model 4310

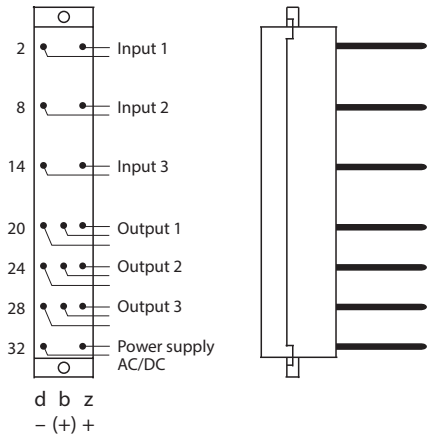


Dimension Drawings and Pin Assignments

for Eurocard EK 8



Front panel, Opt. 174 Front panel, Opt. 301



Connectors: Type F according to DIN 41612

Front panel Opt. 174: INTERMAS SP/K3-n05T, plastic, gray

Front panel Opt. 301: INTERMAS SP/K3-n04T, plastic, gray

Only trained personnel should perform installation, commissioning and maintenance!

All dimensions in mm

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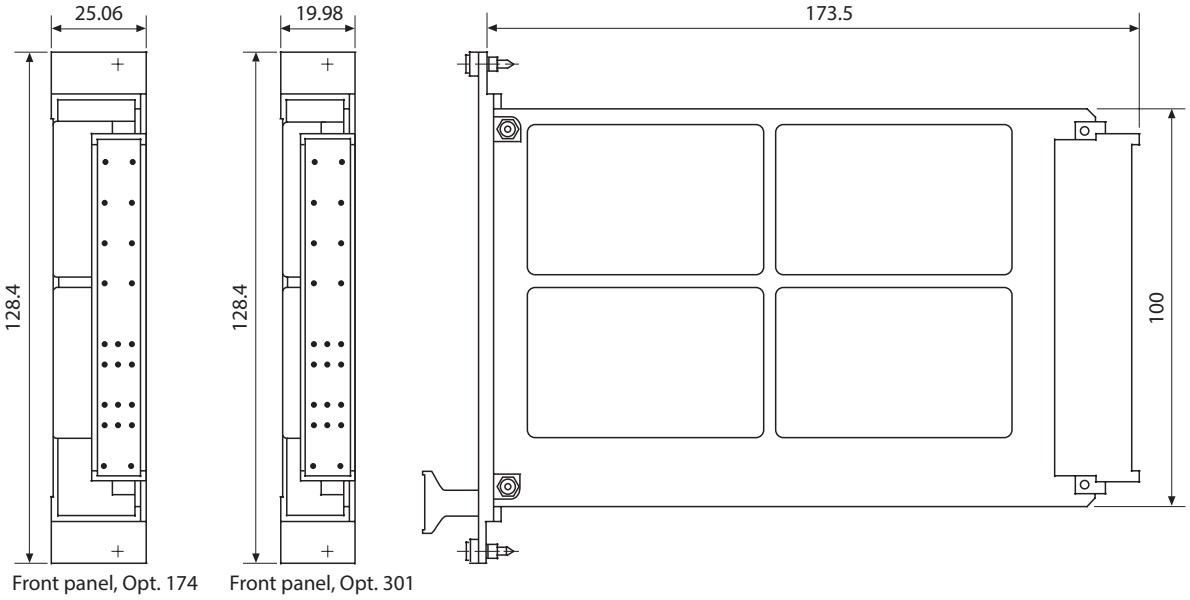
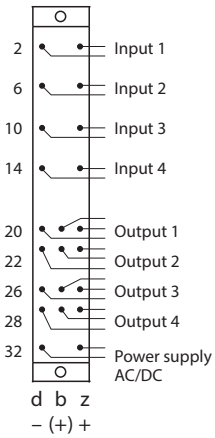
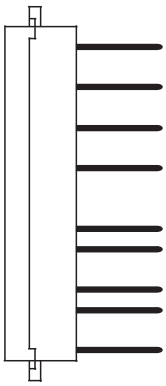
Dimension Drawings and Pin Assignments (continued)

for Eurocard EK 9



Front panel, Opt. 174 Front panel, Opt. 301





Connectors: Type F according to DIN 41612

Front panel Opt. 174: INTERMAS SP/K3-n05T, plastic, gray

Front panel Opt. 301: INTERMAS SP/K3-n04T, plastic, gray

Only trained personnel should perform installation, commissioning and maintenance!

All dimensions in mm