

## Knick >

**For isolation and conversion of impressed signals.**

## IsoAmp® EK 30/31



### The Task

Reliable transmission and conversion of (0)4 ... 20 mA and 0 ... 10 V signals to up to four 0(4) ... 20 mA output signals with high accuracy.

### The Problems

Best possible signal transmission with avoidance of dangerous electric shock.

### The Solution

The Knick standard-signal multipliers provide perfect solutions for

- signal multiplication to up to four output channels with galvanic isolation
- increasing the output load to a max. of 40 V (series connection of output circuits)
- converting the standard current or the voltage input signal to any standard current output signals
- prevention of dangerous electric shocks by Safe Isolation

### The Housing

The compact design allows the use of a Eurocard with a width of just 4 TE. This means up to 84 channels can be accommodated in a 19" rack.

### The Advantages

There are no negative feedback resistors as normally required in conventional amplifiers. The number of components is thus reduced to a minimum. Accuracy and reliability are increased accordingly.

The modular concept allows simple retrofitting of output channels. Your point of measurement is therefore expandable for future measuring tasks.

### The Technology

With an optimized circuit design, the Knick standard-signal multipliers achieve almost perfect signal transmission.

Warranty  
**5 years!**

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

# Standard-Signal Multipliers

Isolation Amplifiers  
Transmitters

Indicators

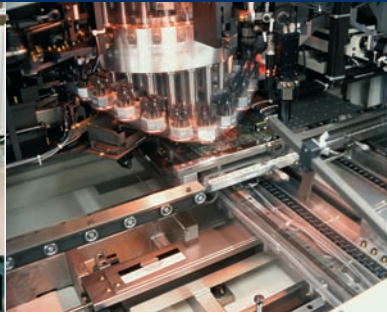
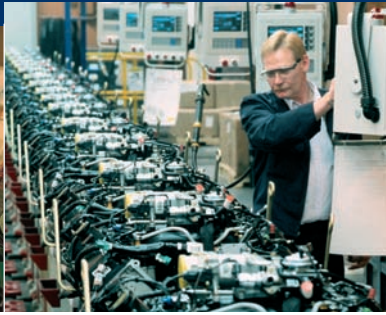
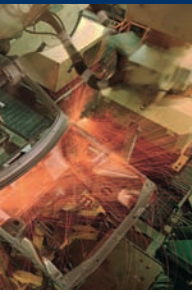
Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings



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## ■ The Facts

### Easy signal switching

Universal use for numerous signal combinations

### 3-port isolation

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

### Safe Isolation according to EN 61140

Protection against unpermitted high voltages

### Compact design

Eurocard with just 4 TE width, up to 84 output channels in a 19" rack

### Maximum accuracy

No distortion of measurement signal

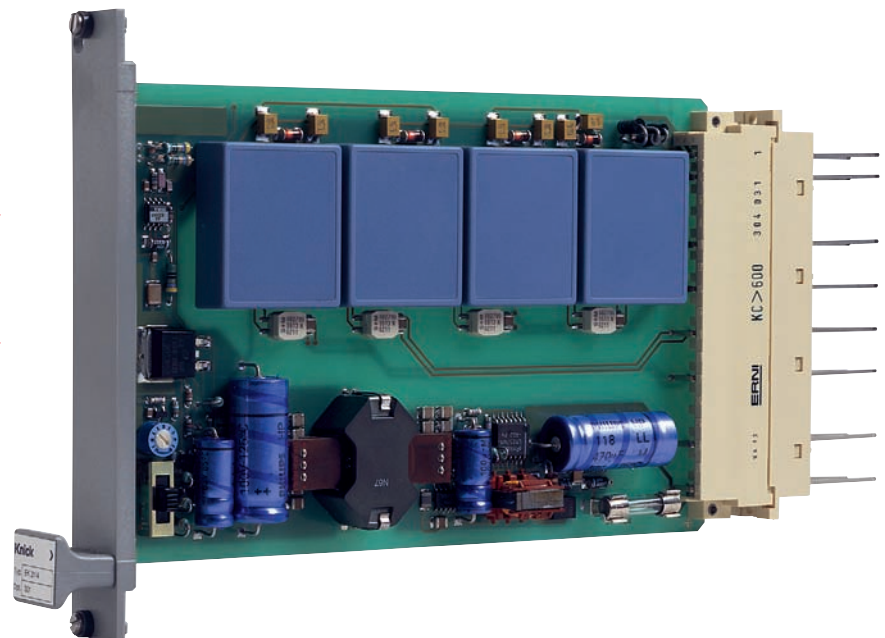
### Maximum reliability

No repair or failure costs

### Expandable

Retrofittable outputs, expandable for future measuring tasks

### 5-year warranty



## IsoAmp® EK 30/31

### ■ Product Line

Eurocards	Configuration	Order No.
IsoAmp® EK 30 Eurocards	2 output channels	EK 30 / 2
	3 output channels	EK 30 / 3
	4 output channels	EK 30 / 4
IsoAmp® EK 31 with Safe Isolation also of the outputs	2 output channels	EK 31 / 2
	3 output channels	EK 31 / 3
	4 output channels	EK 31 / 4
<b>Power supply</b>		
24 V AC/DC		
<b>Option</b>		
INTERMAS SP / K3-n04T front panel, width 20 mm, plastic, gray, mounted		301
<b>Accessories</b>		
Output module for IsoAmp® EK 30, individually retrofittable		46 Mk
Output module with Safe Isolation, for IsoAmp® EK 31, individually retrofittable		46 Mk Opt. 453

### ■ Specifications

#### Input data

Input <sup>1)</sup>	0 ... 20 mA or 4 ... 20 mA, voltage drop approx. 400 V 0 ... 10 V, input resistance 1 Mohm
Configuration	Max. 4 output channels
Overload	100 mA

#### Output data

Output	up to 4 channels, 0 ... 20 mA or 4 ... 20 mA (selectable via slide switches for all channels together)
Load	≤ 500 ohms per channel at 20 mA
Load error	< 0.02 % meas. val./100 ohms
Offset	20 µA at input 0 (4) ... 20 mA 25 µA at input 0 ... 10 V
Residual ripple	< 5 mV

1) Other ranges on request

### Specifications (continued)

#### Transmission behavior

Transmission error<sup>2)</sup> 0.1 % meas. val. with 0 (4) ... 20 mA input  
0.25 % meas. val. with 0 ... 10 V input

Rise or fall time Approx. 5 ms at 500 ohms load

Transmission error<sup>3)</sup> 0.01 % meas. val. with 0 (4) ... 20 mA input  
0.015 %/K of meas. val. with 0 ... 10 V input

#### Power supply

Power supply 24 V DC –15 % +20 %, approx. 2.7 W  
24 V AC –15 % +10 %, 48 ... 500 Hz, approx. 3.5 VA

#### Isolation

Galvanic isolation 3-port isolation between input, output, and power supply

Test voltage	EK 30	Power supply against all other circuits	4 kV AC
		Outputs against each other and against input	510 V AC
	EK 31	All isolating distances	4 kV AC

Working voltages (basic insulation) According to EN 61010-1

Type EK 30	Overvoltage category / Perm. pollution degree	Permitted working voltage
Output against each other and against input	I / degree 4	150 V AC/DC
	II / degree 4	100 V AC/DC
	I / degree 4	50 V AC/DC
Power supply against input and against output	II / degree 2	1000 V AC/DC
	III / degree 2	600 V AC/DC
	III / degree 3	410 V AC/DC
	IV / degree 3	300 V AC/DC
<b>Type EK 31</b>		
All isolating distances	II / degree 2	1000 V AC/DC
	III / degree 2	600 V AC/DC
	III / degree 3	410 V AC/DC
	IV / degree 3	300 V AC/DC

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 to EN 61010-1.  
Working voltage up to overvoltage category III and pollution degree 2  
with EK 30: 300 V AC/DC across power supply and all other circuits,  
with EK 31: 300 V AC/DC across each output and all other circuits as well as across power supply and all other circuits.  
For applications with high working voltages, you should ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.

2) Additional error in live-zero operation (mode selector position 2 and 3) 20 µA

3) Average TC, reference temperature 23 °C; additional error in live-zero operation (mode selector position 2 and 3) 1 µA/K

## IsoAmp® EK 30/31

### Specifications (continued)

#### Standards and approvals

EMC	European EMC regulations; according to 89/336/EEC directive, EN 61326; NAMUR NE 21
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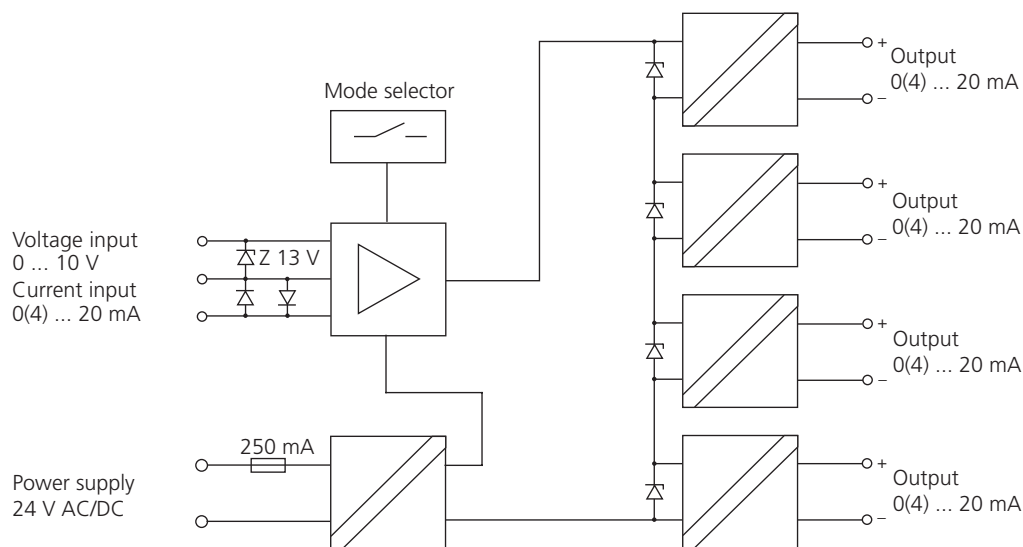
#### Other data

MTBF <sup>4)</sup>	Approx. 144 years/channel
Ambient temperature	Operation: -10 ... +70 °C Transport and storage: -30 ... +80 °C
Design	Eurocard, 4 TE, see also dimension drawing
Pin connector	Type F according to DIN 41612, see also dimension drawings
Socket connector	Type F according to DIN 41612 (included in package contents), see also dimension drawings
Weight	With 2 channels approx. 170 g, with 3 channels approx. 185 g, with 4 channels approx. 200 g

4) Mean Time Between Failures – MTBF – according to EN 61709 (SN 29500).

Conditions: stationary operation in well-kept rooms, average ambient temperature 40 °C, no ventilation, continuous operation

### ■ Block Diagram



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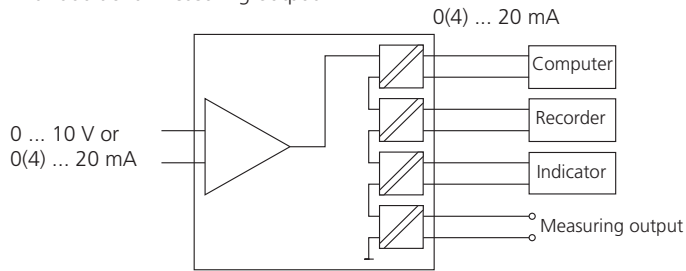
Sensors

Fittings

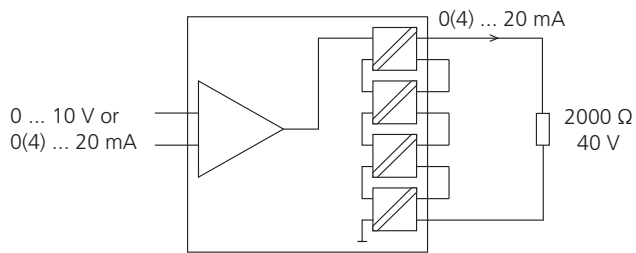
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## ■ Application Examples

Galvanically isolated actuation of computer, recorder, and indicator with additional measuring output

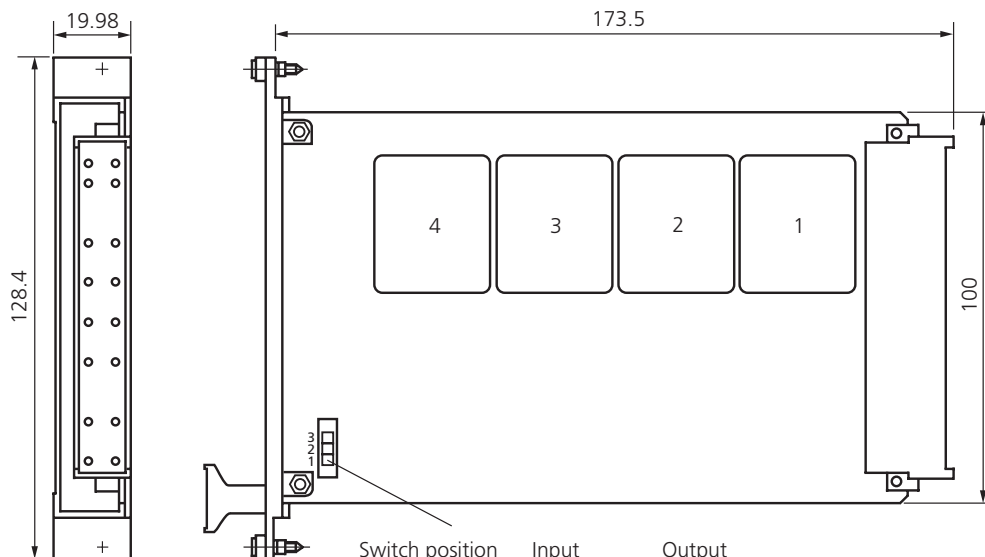


Series connection for increasing the load voltage



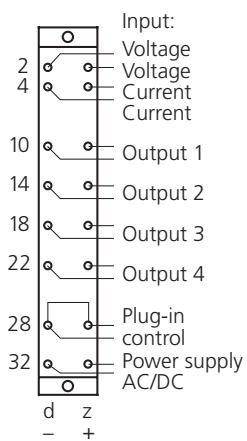
## IsoAmp® EK 30/31

### ■ Dimension Drawings and Pin Assignments



Front panel  
Opt. 301

Switch position	Input	Output
1	0 – 10 V 0 – 20 mA	0 – 20 mA
2	0 – 10 V 0 – 20 mA	4 – 20 mA
3	4 – 20 mA	0 – 20 mA



Plug-in connection: Type F according to DIN 41612

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

Installation, commissioning, and maintenance may only be carried out by trained personnel!

All dimensions in mm!