

**Knick** >

## IsoAmp® 11000/12000



**Universal isolation amplifiers for  $\pm 20$  mV to  $\pm 10$  V or  $\pm 20$  mA input signals.**

### The Models

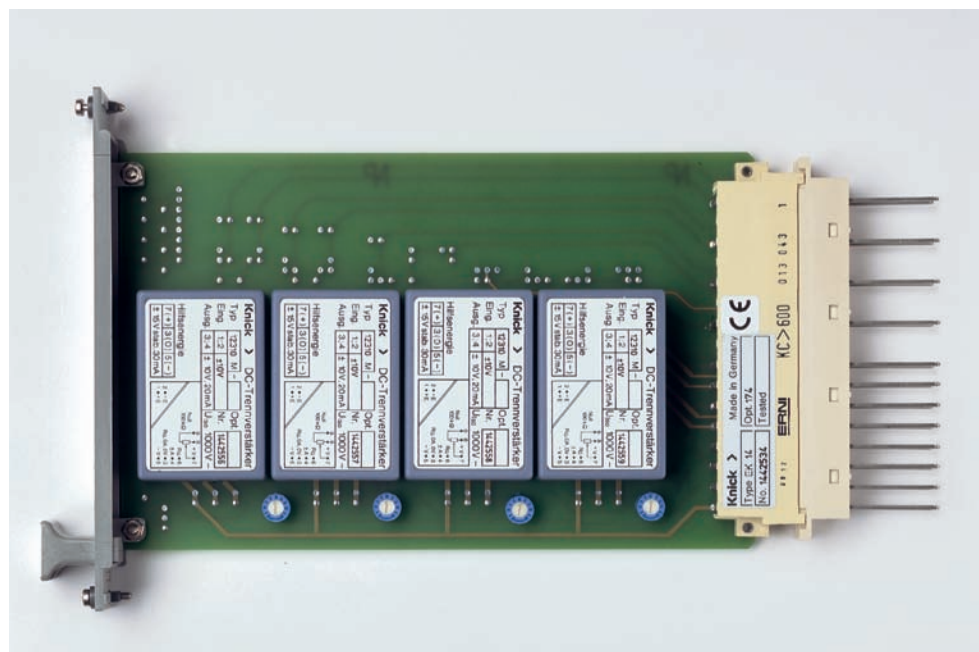
Knick's IsoAmp® 11000/12000 series features a tried and tested range of powerful DC isolation amplifiers that have excellent specifications despite their small dimensions and have a symmetrical input with high common mode rejection.

### The Problems

When conventional unsymmetrical isolation amplifiers are used, measurement signal interference can occur that seem inexplicable to the user at first. If, for example, there are several devices in a current output loop, an isolation amplifier can meet a LO output with its HI input which can cause the above-mentioned signal interference.

### The Inputs

On the Knick IsoAmp® 11000/12000 DC isolation amplifiers, the input is symmetrical, i. e. both input terminals can be exchanged without undesired effects on the common mode rejection.



Models with connections for external gain setting, zeroing and live-zero switching (0 ... 20 mA/ 4 ... 20 mA) are available for special tasks.

### The Applications

The isolation amplifiers allow trouble-free use, particularly for applications where small dimensions are required in conjunction with high isolation voltage, high accuracy, and maximum reliability.

**Warranty**  
**5 years!**

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

# Universal Isolation Amplifiers

Isolation Amplifiers  
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings



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### ■ The Facts

**Symmetrical input**  
with high common mode rejection

**Excellent specifications**

**High isolation voltage**

**High output power**

**Optional external gain adjustment** with just one resistor

**Live-zero switching**

**Complete modules** without external wiring

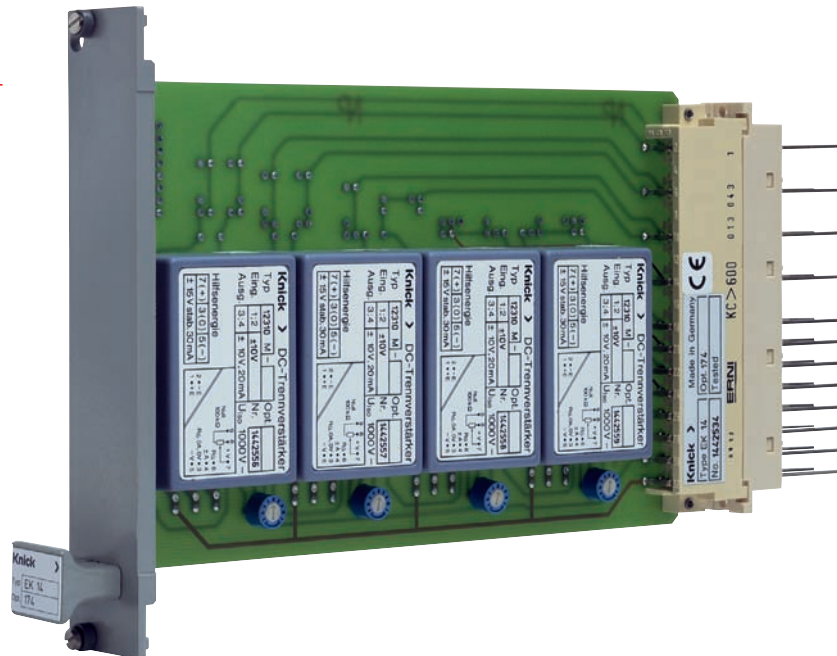
**Eurocard up to 4 channels**

**Eurocard up to 2 channels,** floating outputs

**High quality and reliability**

**100 % computer-aided production control and final inspection**

**5-year warranty**



Eurocards

## IsoAmp® 11000/12000

### ■ Product Line

Devices		Order No.			
IsoAmp® 11000/12000 Eurocards	For up to 4 channels	EK 14 –... <sup>1)</sup>			
	With isolation transformer for isolated supply For up to 2 channels	EK 16 –... <sup>1)</sup>			
Channels for Eurocards	Symmetrical input	Impressed output	Loadability		
Free wiring	Up to ±500 mV depending on wiring	±20 mA	10 V <sup>2)</sup>	11001 M	
	Up to ±500 mV depending on wiring	±10 V <sup>2)</sup>	20 mA	12001 M	
Fixed settings	±20 mV	±20 mA	10 V <sup>2)</sup>	11202 M	
	±60 mV	±20 mA	10 V <sup>2)</sup>	11206 M	
	±150 mV	±20 mA	10 V <sup>2)</sup>	11215 M	
	±500 mV	±20 mA	10 V <sup>2)</sup>	11250 M	
	±10 V	±20 mA	10 V <sup>2)</sup>	11310 M	
	±20 mA	±20 mA	10 V <sup>2)</sup>	11820 M	
	±20 mV	±10 V	20 mA	12202 M	
	±60 mV	±10 V	20 mA	12206 M	
	±150 mV	±10 V	20 mA	12215 M	
	±500 mV	±10 V	20 mA	12250 M	
	±10 V	±10 V	20 mA	12310 M	
	±20 mA	±10 V	20 mA	12820 M	
	Options				
	Eurocard	INTERMAS front panel for EK 14 or EK 16 Eurocard, mounted			174
EK 14 or EK 16 Eurocard with wiring to customer requirements in the range $V_{in} \geq 20 \text{ mV} \dots \leq 200 \text{ V}$ or $I_{in} \geq 100 \mu\text{A} \dots \leq 50 \text{ mA}$				185 <sup>3)</sup>	
Channels for Eurocard	Output ±0 ... 20 mA or +4 ... 20 mA, switchable (additional error with live zero: ±10 µA)			173	
	Gain error < 0.1 % of measured value (not for Model 11202)			04 <sup>3)</sup>	

1) Please indicate the required channel configuration when ordering. Any channel combination possible.

2) ±10 V or 20 V unipolar (note power supply!)

3) Options 04 and 185 cannot be combined.

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## ■ Specifications

### Input data

Input	See Product Line
Configuration	EK 14 Max. 4 channels also in combined version EK 16 Max. 2 channels also in combined version (EK16 with isolation transformer for isolated supply)
Input resistance	> 1 Mohm, for models with $I_{in} \pm 20$ mA: 7.5 ohms
Overload	$V_{in} \leq 25$ V, $I_{in} \leq 300$ mA

### Output data

Output	See Product Line
Offset current <sup>2)</sup>	< 50 nA
Offset voltage <sup>2)</sup> Drift	< 500 $\mu$ V, external nulling < 5 $\mu$ V/month
Residual ripple	$\leq 10$ mV <sub>pp</sub>

### Transmission behavior

Gain error	< 0.2% meas. val., Option 04: < 0.1 % meas.val.
Cutoff frequency <sup>1)</sup>	> 1.5 ... 5 kHz -3 dB (20 mV ... 500 mV or 10 V) (different values on request)
Temperature coefficient <sup>2)3)</sup>	< 1 nA/K, < 2 $\mu$ V/K (reference temperature 23 °C)

### Power supply

EK 14	$\pm 14.5$ ... 15.5 V stabilized, approx. 30 mA for unipolar operation up to 20 V output voltage: -5, +25 V, stabilized
EK 16 with isolation transformers for isolated supply	24 V - $\pm 10$ %, approx. 80 mA 30 V <sup>4)</sup> - $\pm 10$ %, approx. 60 mA, switchable

### Isolation

Galvanic isolation	3-port isolation between input, output and power supply
Test voltage across input and output/power supply	4 kV AC

1) Current output up to 250 ohm load, models 11310 and 12310 up to 10 V<sub>pp</sub>

2) x 10 for models 11310, 12310

3) Offset set to zero

4) For operation with  $\pm 15$  V without 0-V line

## IsoAmp® 11000/12000

### Specifications (continued)

#### Isolation (continued)

Working voltage (basic insulation)	EK 14: 600 V AC/DC EK 16: 900 V DC each input against all other inputs and outputs 250 V DC power supply against all other circuits with overvoltage category II and pollution degree 2 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.
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#### Standards and approvals

EMC	European EMC regulations, according to directive 89/336/EEC
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#### Other data

Ambient temperature	-10 ... +70 °C
Design	Eurocard 5 TE
Pin connector	Type F according to DIN 41612, see also dimension drawings
Socket connector <sup>5)</sup>	Type F according to DIN 41612 (wire-wrap connection), see also dimension drawings
Front plate	Option 174: INTERMAS SP / K 3-n 05 T, plastic, gray, see also dimension drawings
Weight	Approx. 45 g per channel

5) The socket connector belongs to package contents

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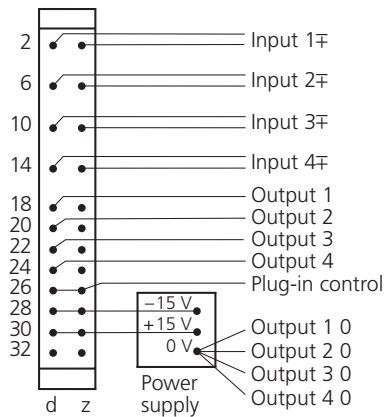
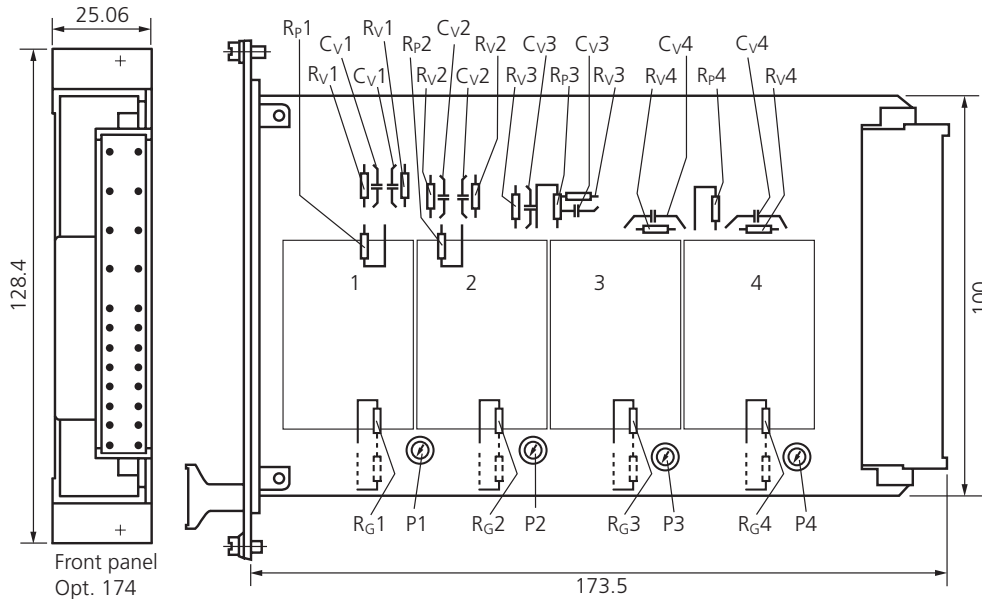
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## ■ Dimension Drawings and Pin Assignments

### EK 14, Equipped with 11000 M



Wiring is not required for fixed-range models!

Separate the strip conductors when  $R_V$ ,  $C_V$  are mounted!

$R_G$ : Negative feedback resistor

$R_P$ : Shunt resistor

$R_V$ : Sym. voltage divider ( $R_V$ ,  $R_P$ ,  $R_V$ )

$C_V$ : Frequency compensation

P1 ... P4 = Nulling potentiometer

$$\text{Model 11001: } R_G = \frac{V_{in}}{20} [\Omega, \text{ mV}] \quad (1 \dots 25 \Omega)$$

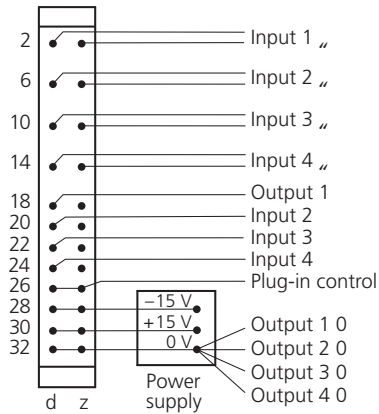
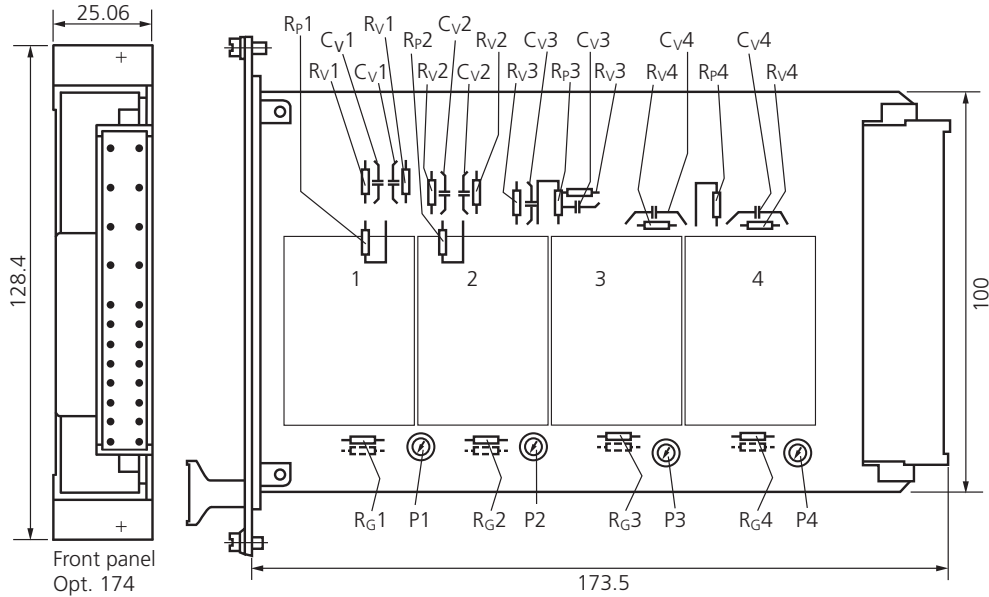
#### Output with Option 173

	$\pm 0 \dots 20 \text{ mA}$	$+4 \dots 20 \text{ mA}$
Output 1	d 18	z 18
Output 2	d 20	z 20
Output 3	d 22	z 22
Output 4	d 24	z 24

## IsoAmp® 11000/12000

### Dimension Drawings and Pin Assignments (continued)

#### EK 14, Equipped with 12000 M



Wiring is not required for fixed-range models!

Separate the strip conductors when  $R_V$ ,  $C_V$  are mounted!

$R_G$ : Negative feedback resistor

$R_P$ : Shunt resistor

$R_V$ : Sym. voltage divider ( $R_V$ ,  $R_P$ ,  $R_V$ )

$C_V$ : Frequency compensation

P1 ... P4 = Nulling potentiometer

$$\text{Model 12001: } R_G = \frac{20500 V_{in}}{10000 - V_{in}} [\Omega, \text{mV}] \quad (41.1 \dots 1079 \Omega)$$

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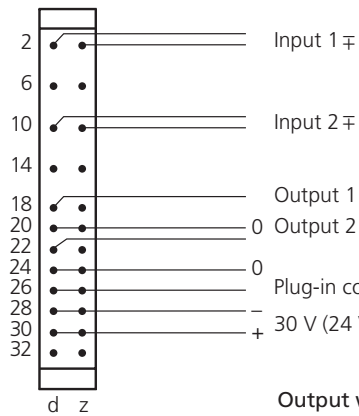
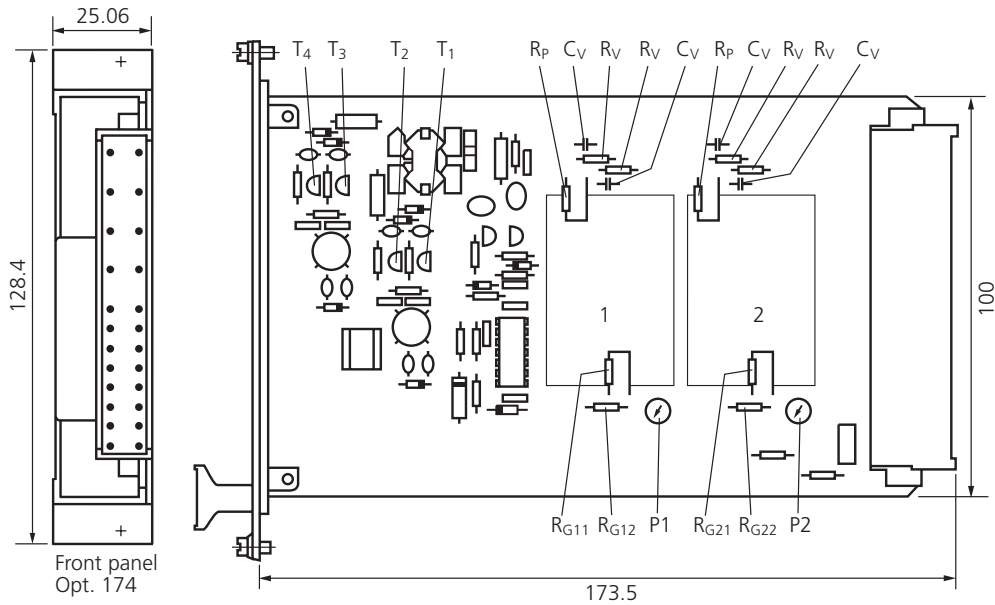
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## Dimension Drawings and Pin Assignments (continued)

### EK 16, Equipped with 11000/12000 M



Wiring is not required for fixed-range models!

$R_{G11}$ ,  $R_{G21}$ : Negative feedback resistor 11000 M

$R_{G12}$ ,  $R_{G22}$ : Negative feedback resistor 12000 M

$R_P$ : Shunt resistor

$R_V$ : Sym. voltage divider ( $R_V$ ,  $R_P$ ,  $R_V$ )

$C_V$ : Frequency compensation

P1, P2 = Nulling potentiometer

Separate the strip conductors when  $R_V$ ,  $C_V$  are mounted!

12000 M: Base emitters of  $T_1$ ,  $T_2$  or  $T_3$ ,  $T_4$  must be jumpered.

#### Output with 11000 M Option 173

	$\pm 0 \dots 20 \text{ mA}$	$+4 \dots 20 \text{ mA}$
Output 1	d 18/dz 20	d 18/dz 20
Output 2	d 22/dz 24	d 22/dz 24

All dimensions in mm!