

# EURAX G 537

## Transducer for phase angle difference

EURAX plug-in module in Euro format



### Application

The transducer **EURAX G 537** (Fig. 1) converts the phase angle difference of two synchronised supplies into a **load independent** DC current or a **load independent** DC voltage proportional to the measured value.

The transducer 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.



Fig. 1. EURAX G 537 as plug-in module for 19" rack-mounted case, front plate width 7 TE.

### Features / Benefits

- **Measuring inputs:** Sine, rectangular or distorted wave forms of nominal input voltages with dominant fundamental waves

Measured variables	Nominal input voltages	Measuring range limits
Phase angle difference	10 to 690 V	$\pm 10$ to $\pm 180$ °el

- **Measuring output:** Unipolar, bipolar or live zero output variables
- **Measuring principle:** Measurement of the zero crossing interval
- **Wide DC, AC power pack tolerance / Universal**
- **Plug-in module (front plate width 7 TE) for 19" rack-mounted case / Ease of mounting in rack system**

### Technical data

#### General

Measured quantity: Phase angle difference  
 Measuring principle: Measurement of the zero crossing interval

#### Measuring inputs $\rightarrow$

Measuring range: See section «Specification and ordering information»  
 Nominal frequency  $f_N$ : 50 or 60 Hz  
 Nominal input voltage  $U_N$ : Generator and bus bar 10...230 V or 230...690 V (max. 230 V with power supply from voltage measuring input)  
 Sensitivity: 10 ... 120%  $U_N$   
 Own consumption:  $< U_N \cdot 1.5$  mA per measuring input

Overload capacity:

Measured quantities $U_N$	Number of applications	Duration of one application	Interval between two successive applications
$1.2 \times U_N^1$	---	permanently	---
$2 \times U_N^1$	10	1 s	10 s

<sup>1</sup> But max. 264 V with power supply from voltage measuring input.

#### Measuring output $\rightarrow$

Load independent DC current: 0...1 to 0...20 mA resp. live-zero 0.2...1 to 4...20 mA  $\pm 1$  to  $\pm 20$  mA  
 Burden voltage: + 15 V, resp. - 12 V  
 Load independent DC voltage: 0...1 to 0...10 V resp. live-zero 0.2...1 to 2...10 V  $\pm 1$  to  $\pm 10$  V  
 Load capacity: Max. 4 mA  
 Voltage limit under  $R_{ext} = \infty$ :  $\leq 25$  V  
 Current limit under overload: Approx.  $1.3 \times I_{AN}$  at current output Approx. 30 mA at voltage output  
 Residual ripple in output current:  $< 0.5\%$  p.p.  
 Nominal value of response time: 4 periods of the measuring frequency  
 Other ranges: 2, 8 or 16 periods of the measuring frequency

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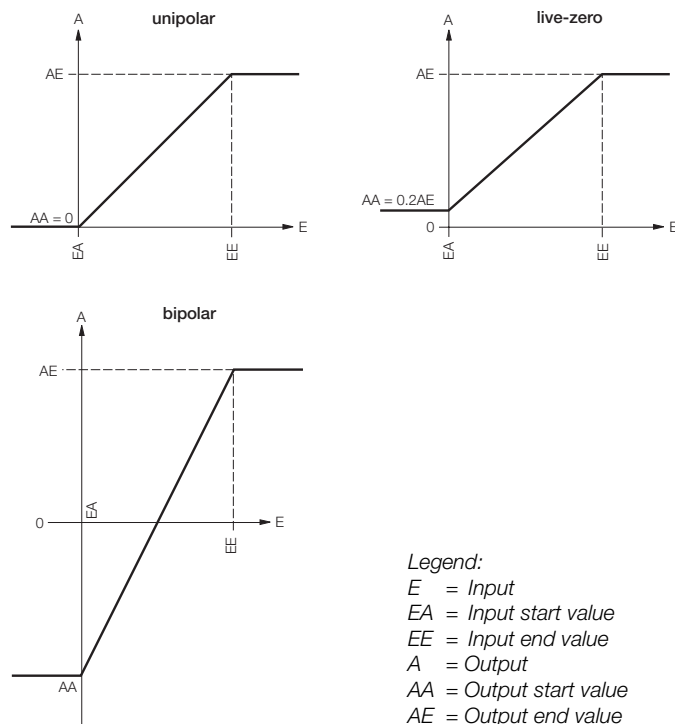
Behaviour of output current in different operating states:

Operating state <sup>1</sup>		Output	
Generator voltage $U_G$	Bus bar voltage $U_S$	unipolar	bipolar
leading ( $f_G = f_S$ )		$> I_{AN} / 2$	positive
missing <sup>2</sup>	nominal value	indefinite	indefinite
nominal value	missing <sup>2</sup>		
missing <sup>2</sup>	missing <sup>2</sup>		

<sup>1</sup> With power supply switched on

<sup>2</sup> E.g. switched off or fault condition

### Output characteristic



### Accuracy (acc. to IEC 688)

Reference value:  $\Delta\phi = 90^\circ$   
 Basic accuracy: Class 0.5

### Reference conditions:

Ambient temperature: 15...30 °C  
 Input voltage:  $U_G = 0.8 \dots 1.2 U_S$   
 Frequency:  $f_N \pm 10\%$   
 Wave form: Sine  
 Power supply: At nominal range  
 Output burden:  $\Delta R_{ext} \text{ max.}$

### Safety

Protection class: II (protection isolated, EN 61 010)

Pollution degree: 2  
 Installation category: III  
 Rated insulation voltage (against earth): 230 resp. 400 V, inputs  
 230 V, power supply  
 40 V, output  
 Test voltage: 50 Hz, 1 min. acc. to EN 61 010-1  
 3700 resp. 5550 V, inputs versus all other circuits  
 3250 V, inputs versus each other  
 3700 V, power supply versus output

### Power supply $\rightarrow \bigcirc$

DC, AC power pack (DC or 40 ... 400 Hz)

Table 1: Rated voltages and permissible variations

Rated voltage	Tolerance
85 ... 230 V DC, AC	DC - 15 ... + 33%
24 ... 60 V DC, AC	AC $\pm 15\%$

or

Power supply from voltage measuring input: 24...60 V AC or 85...230 V AC  
 Power consumption: Approx. 2 W resp. 4 VA

### Installation data

Mechanical design: Plug-in module for 19" rack-mounted case, Euro format 100 x 160 mm  
 Space requirements: 7 TE (35.26 mm) (see section "Dimensional drawing")  
 Front plate colour: Grey RAL 7032  
 Designation: EURAX G 537  
 Mounting position: Any  
 Electrical connections: 32-pole plug acc. to DIN 41 612, pattern F  
 Contact fitting see section "Electrical connections"  
 Coding: By coding pins, removed / not removed, see section "Electrical connections"  
 Weight: Approx. 0.21 kg

### Environmental conditions

Operating temperature: - 10 to + 55 °C  
 Storage temperature: - 40 to + 70 °C  
 Relative humidity of annual mean:  $\leq 75\%$

### Ambient tests

EN 60 068-2-6: Vibration  
 Acceleration:  $\pm 2 g$

Frequency range:	10 ... 150 ... 10 Hz, rate of frequency sweep: 1 octave/minute	Acceleration:	3 × 50 g, 3 shocks each in 6 directions
Number of cycles:	10, in each of the three axes	EN 60 068-2-1/-2/-3:	Cold, dry heat, damp heat
EN 60 068-2-27:	Shock		

**Table 2: Specification and ordering information**

Order Code <b>537</b> -								
Features, Selection	*SCODE	no-go						
<b>1. Mechanical design</b> 2) Plug-in module for 19" rack-mounted case			2 . . . . .					
<b>2. Nominal input frequency</b> 1) 50 Hz			. 1 . . . . .					
2) 60 Hz			. 2 . . . . .					
9) Non-standard [Hz] <input type="text"/> ≥ 10 to 1500; With power supply from measuring input min. 40 Hz, max. 400 Hz			. 9 . . . . .					
<b>3. Nominal input voltage</b> Generator and bus bar:								
1) U <sub>N</sub> : 100 V	A		. . 1 . . . . .					
2) U <sub>N</sub> : 230 V	A		. . 2 . . . . .					
9) Non-standard [V] <input type="text"/> ≥ 10.00 to 690; 3 phase system: Input voltage = phase to phase voltage With power supply from measuring input min. 24 V, max. 230 V, see feature 6, lines 3 and 4			. . 9 . . . . .					
<b>4. Measuring range</b>								
1) - 120 ... 0 ... 120 °el			. . . 1 . . . . .					
9) Non-standard [°el] <input type="text"/> Measuring range - 180...0...180, but unambiguous output value up to - 175...0...175 °el; measuring span ≤ 20 °el			. . . 9 . . . . .					
<b>5. Output signal</b>								
1) 0 ... 20 mA			. . . . 1 . . . .					
2) 4 ... 20 mA			. . . . 2 . . . .					
9) Non-standard 0...1.00 to 0...< 20, [mA] <input type="text"/> - 1.00...0...1.00 to - 20...0...20 (symmetrical) 0.2...1 to < (4...20) (AA/AE = 1/5)			. . . . 9 . . . .					
A) 0 ... 10 V			. . . . A . . . .					
Z) Non-standard 0...1.00 to 0...< 10, [V] <input type="text"/> - 1.00...0...1.00 to - 10...0...10 (symmetrical) 0.2...1 to 2...10 (AA/AE = 1/5)			. . . . Z . . . .					
AA = Output start value, AE = Output end value								
<b>6. Power supply</b>								
1) 85 ... 230 V DC, AC			. . . . . 1 . . .					
2) 24 ... 60 V DC, AC			. . . . . 2 . . .					
3) Internal from measuring input (24 ... 60 V AC)		A	. . . . . 3 . . .					
4) Internal from measuring input (85 ... 230 V AC)			. . . . . 4 . . .					

Continuation of "Table 2: Specification and ordering information" see on next page!

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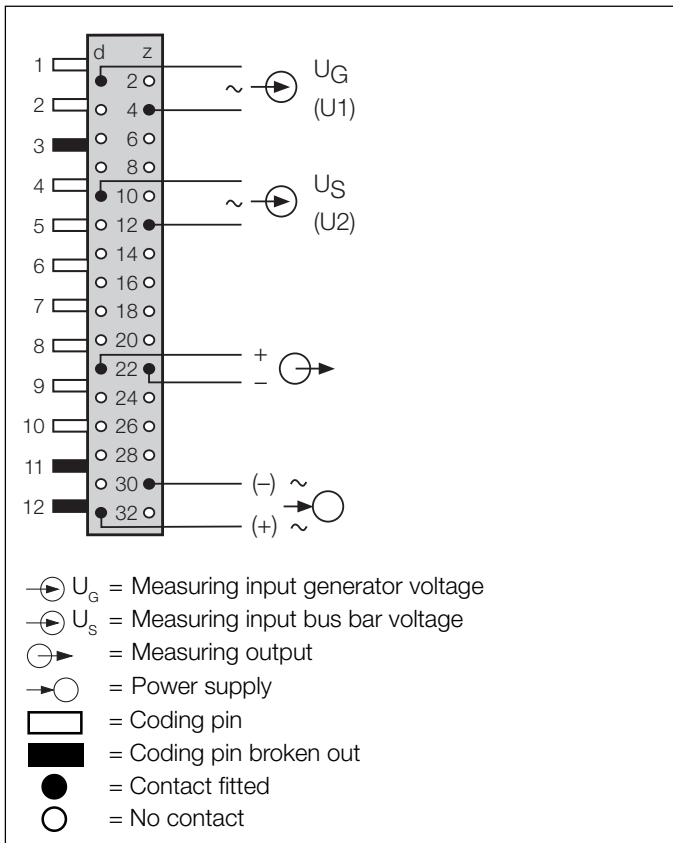
## Transducer for phase angle difference

Continuation of "Table 2: Specification and ordering information"

Order Code 537 -											
Features, Selection						*SCODE	no-go				
<b>7. Response time</b>											
1) 4 periods of the input frequency (Standard)							1 . . . . .				
2) 2 periods of the input frequency							2 . . . . .				
3) 8 periods of the input frequency							3 . . . . .				
4) 16 periods of the input frequency							4 . . . . .				
<b>8. Test certificate</b>											
0) Without test certificate							. 0 . . . . .				
D) Test certificate in German							. D . . . . .				
E) Test certificate in English							. E . . . . .				

\* Lines with letter(s) under "no-go" cannot be combined with preceding lines having the same letter under "SCODE"

### Electrical connections



### Dimensional drawing

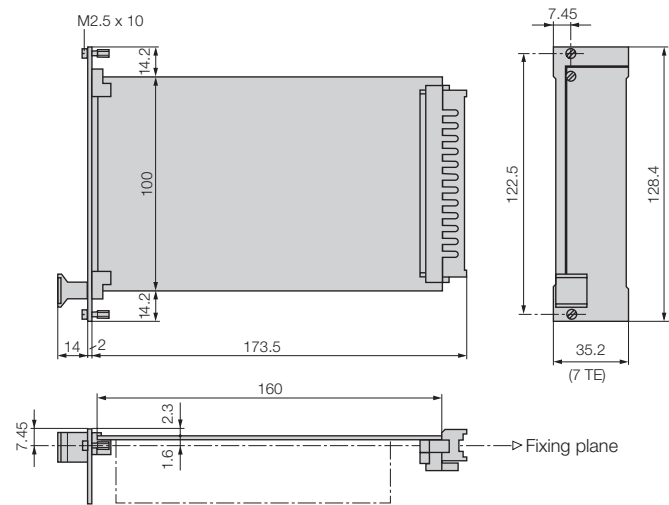


Fig. 3. EURAX G 537, front plate width 7 TE.

Fig. 2. EURAX G 537, view of the rear of plug-in module.