

# SINEAX F 534

## Transducer for measuring frequency

Carrying rail housing P13/70



### Application

The transducer **SINEAX F 534** (Fig. 1) is intended for frequency measurement. The instrument change the measured value into a proportional **load independent** DC current or DC voltage.

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.

### Features / Benefits

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

Measured variable	Nominal input voltage	Measuring range limits
Frequency	10 to 690 V	≥ 10 Hz to ≤ 1.5 kHz

- **Measuring output:** Unipolar, bipolar or live zero output variables
- **Measuring principle:** Digital period measurement
- **AC/DC power supply / Universal**
- **Standard as marine version per Lloyd's Register of Shipping**



Fig. 1. Transducer SINEAX F 534 in housing P13/70 clipped onto a top-hat rail.

### Table 1: Standard versions

The following transducer versions are available as standard versions. It is only necessary to quote the **Order No.:**

Nominal input voltage	Measuring range	Output signal	Power supply DC or 40 ... 400 Hz	Response time Periods of the input frequency	Order No.
10 ... 230 V	45 ... 55 Hz	0 ... 20 mA	85 ... 230 V	4	130 013
	45 ... 55 Hz	4 ... 20 mA			130 021
	48 ... 52 Hz	0 ... 20 mA			127 044
	48 ... 52 Hz	4 ... 20 mA			130 039
230 ... 690 V	45 ... 55 Hz	0 ... 20 mA			127 052
	45 ... 55 Hz	4 ... 20 mA			127 078
	48 ... 52 Hz	0 ... 20 mA			127 060
	48 ... 52 Hz	4 ... 20 mA			127 086

Please complete the Order Code 534-4... .. acc. to "Table 3: Specification and Ordering Information" for other versions.

### Technical data

#### General

Measured quantity: Frequency  
Measuring principle: Digital period measurement

#### Measuring input $\rightarrow$

Measuring ranges: Selectable between  $f_u = 10$  Hz and  $f_o = 1500$  Hz

Min. span:  $f_u / (f_o - f_u) < 50$

Nominal input voltage  $U_N$ : 10 ... 230 V or 230 ... 690 V (max. 230 V with power supply from voltage measuring input)

Own consumption:  $< U_N \cdot 1.5$  mA

Overload capacity:

Input quantity $U_N$	Number of applications	Duration of one application	Interval between two successive applications
$1.2 \times U_N^1$	---	continuously	---
$2 \times U_N^1$	10	1 s	10 s

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

Wave form: Any; fundamental wave only taken into account

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### Measuring output

Load-independent DC current:	0 ... 1 to 0 ... 20 mA resp. live-zero 1 ... 5 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 voltage output:	Approx. 30 mA
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

### Accuracy (acc. to DIN/IEC 688-1)

Reference value:	Output span
Basic accuracy:	Class 0.2

### Reference conditions

Ambient temperature	15 ... 30 °C
Input voltage	$U_{min}$ to $U_{max}$
Input frequency	Within the measuring span
Distortion factor	No influence
Power supply	At nominal range
Output burden	$\Delta R_{ext}$ max.

### Safety

Protection class:	II (protection isolated, DIN EN 61 010)
Housing protection:	IP 40 (test wire, EN 60 529) IP 20, terminals (test finger, EN 60 529)
Contamination level:	2
Overvoltage category:	III
Rated insulation voltage (against earth):	230 resp. 400 V, input 230 V, power supply 40 V, output
Test voltage:	50 Hz, 1 min. acc. to DIN EN 61 010-1 3700 resp. 5550 V, input versus all other circuits as well as outer surface 3700 V, power supply versus output as well as outer surface 490 V, output versus outer surface

### Power supply AC/DC power pack (DC or 40 ... 400 Hz)

Table 2: Rated voltages and permissible variations

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

Power supply from voltage measuring input:	24 ... 60 V AC or 85 ... 230 V AC Note: 40 Hz < f < 400 Hz
Option:	Connect to the low tension to terminals 12 and 13 24 V AC or 24 ... 60 V DC
Power consumption:	Approx. 2 W resp. 4 VA

### Installation data

Mechanical design:	Housing <b>P13/70</b>
Material of housing:	Lexan 940 (polycarbonate), flammability Class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen
Mounting:	For rail mounting
Mounting position:	Any
Weight:	Approx. 0.23 kg

### Connecting terminals

Connection element:	Screw-type terminals with indirect wire pressure
Permissible cross section of the connection leads:	$\leq 4.0$ mm <sup>2</sup> single wire or 2 x 2.5 mm <sup>2</sup> fine wire

### Environmental conditions

Climatic rating:	Climate class 3 acc. to VDI/VDE 3540
Operating temperature:	- 10 to + 55 °C
Storage temperature:	- 40 to + 70 °C
Relative humidity of annual mean:	$\leq 75\%$

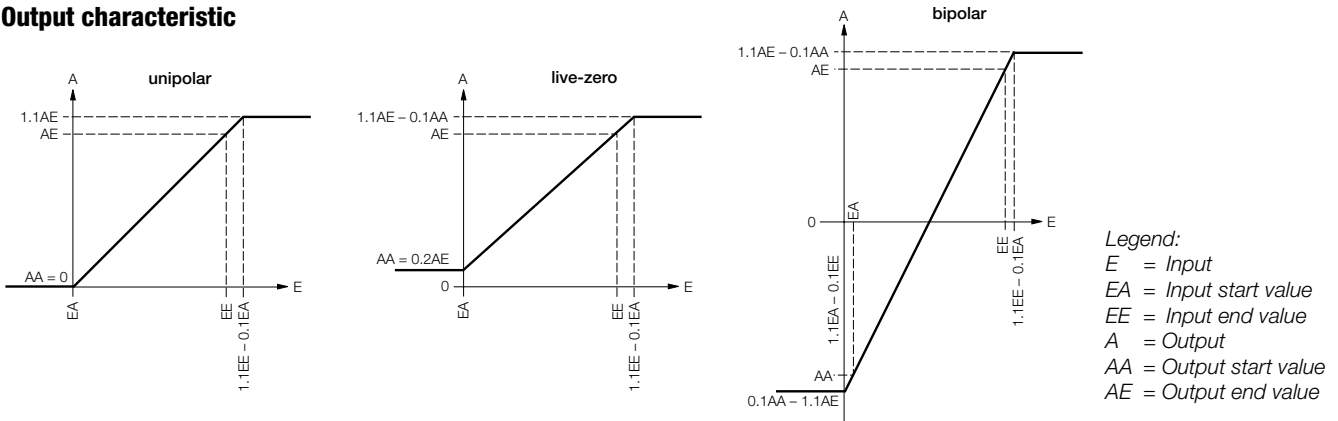
### Vibration withstand

(tested according to DIN EN 60 068-2-6)	
Acceleration:	$\pm 2$ g
Frequency range:	10 ... 150 ... 10 Hz, rate of frequency sweep: 1 octave / minute
Number of cycles:	10 in each of the three axes
Result:	No faults occurred, no loss of accuracy and no problems with the snap fastener

### Germanischer Lloyd

Type approval certificate:	No. 12 261-98 HH
Ambient category:	C
Vibration:	0.7 g

**Output characteristic**



**Table 3: Specification and ordering information** (see also Table 1: Standard versions)

Order Code <b>534</b> -			
Features, Selection	*SCODE	no-go	
<b>1. Mechanical design</b> 4) Housing P13/70 for rail mounting			
<b>2. Nominal input voltage</b> 1) $U_N$ : 10 ... 230 V 2) $U_N$ : > 230 ... 690 V 3 phase system: Input voltage = phase to phase voltage Line 2: Not possible with power supply from measuring input	A	4 . . . . .  . 1 . . . . . . 2 . . . . .	
<b>3. Measuring range</b> 1) 45 ... 50 ... 55 Hz 2) 47 ... 49 ... 51 Hz 3) 47.5 ... 50 ... 52.5 Hz 4) 48 ... 50 ... 52 Hz 5) 58 ... 60 ... 62 Hz 9) Non-standard limit values [Hz] <input type="text"/> Start value $f_a \geq 10$ Hz, end value $f_e \leq 1.5$ kHz Min. span $f_a / (f_e - f_a) < 50$ With power supply from measuring input min. 40 Hz, max. 400 Hz		. . . 1 . . . . . . . . 2 . . . . . . . . 3 . . . . . . . . 4 . . . . . . . . 5 . . . . . . . . 9 . . . . .	
<b>4. Output signal</b> 1) 0 ... 20 mA 2) 4 ... 20 mA 9) Non-standard [mA] <input type="text"/> 0...1.00 to 0...< 20, -1.00...0...1.00 to -20...0...20 (symmetrical) 1...5 to < (4...20) (AA/AE = 1/5) A) 0 ... 10 V Z) Non-standard [V] <input type="text"/> 0...1.00 to 0...< 10, -1.00...0...1.00 to -10...0...10 (symmetrical) 0.2...1 to 2...10 (AA/AE = 1/5) AA = Output start value, AE = Output end value		. . . 1 . . . . . . . . 2 . . . . . . . . 9 . . . . .  . . . A . . . . . . . . Z . . . . .	

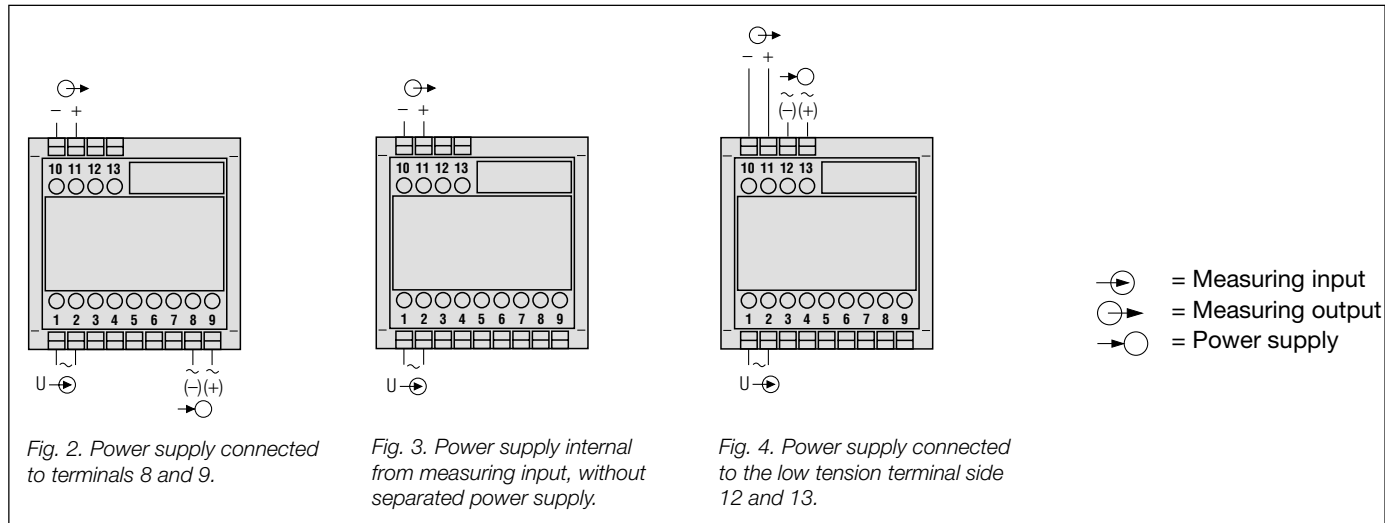
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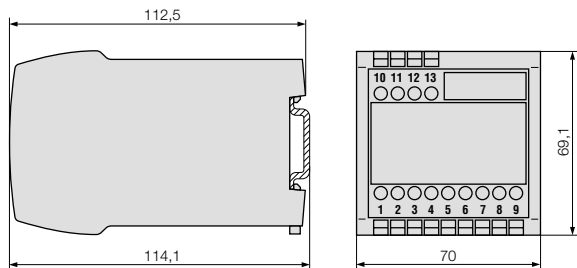
Order Code 534 -											
Features, Selection	*SCODE	no-go									
<b>5. Power supply</b>											
1) 85 ... 230 V DC/AC											
2) 24 ... 60 V DC/AC											
3) Internal from measuring input (24 V AC to 60 V AC)		A									
4) Internal from measuring input (85 V AC to 230 V AC)		A									
5) Connect to the low tension 24 V AC / 24 ... 60 V DC											
<b>6. Response time</b>											
1) 4 periods of the input frequency (standard)											
2) 2 periods of the input frequency											
3) 8 periods of the input frequency											
4) 16 periods of the input frequency											
		1	. . . . .								
		2	. . . . .								
		3	. . . . .								
		4	. . . . .								
		. 1	. . . . .								
		. 2	. . . . .								
		. 3	. . . . .								
		. 4	. . . . .								

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

### Electrical connections



### Dimensional drawing



### Standard accessories

1 Operating Instructions in three languages: German, French, English

Fig. 5. Housing P13/70 clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).

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