

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**

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

¹ But max. 264 V with power supply from voltage measuring input



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

Wave form: Any; fundamental wave only taken into account

Measuring output \rightarrow

Load-independent DC current:	0 ... 1 to 0 ... 20 mA resp. live-zero 1 ... 5 to 4 ... 20 mA ± 1 to ± 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 ± 1 to ± 10 V
Load capacity:	Max. 4 mA
Voltage limit under $R_{ext} = \infty$:	≤ 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 EN 60 688)

Reference value:	Output span
Basic accuracy:	Class 0.2

Reference conditions

Ambient temperature	15 ... 30 °C
---------------------	--------------

SINEAX F 534

Transducer for measuring frequency

Input voltage	U_{\min} to U_{\max}
Input frequency	Within the measuring span
Distortion factor	No influence
Power supply	At nominal range
Output burden	ΔR_{ext} max.

Safety

Protection class:	II (protection isolated, 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 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 1: Rated voltages and permissible variations

Rated voltage	Tolerance
85 ... 230 V DC / AC	DC - 15 ... + 33%
24 ... 60 V DC / AC	AC ± 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 termi- nals 12 and 13 24 V AC or 24 ... 60 V DC
Power consumption:	Approx. 2 W resp. 4 VA

Installation data

Mechanical design:	Housing P13/70
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:	≤ 4.0 mm ² single wire or 2 × 2.5 mm ² fine wire

Environmental conditions

Operating temperature:	- 10 to + 55 °C
Storage temperature:	- 40 to + 70 °C
Relative humidity of annual mean:	≤ 75%
Altitude:	2000 m max.
Indoor use statement	

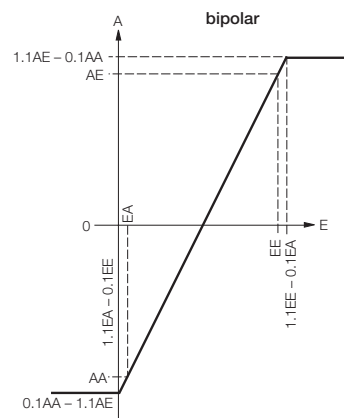
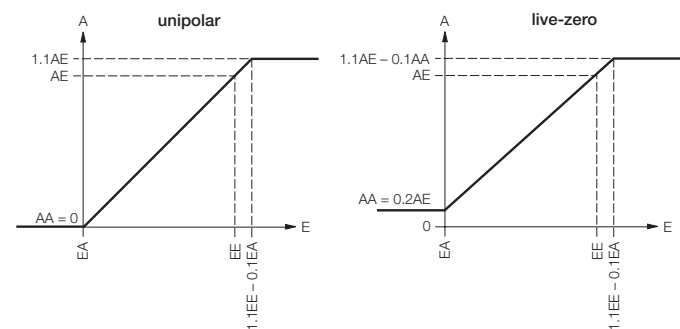
Ambient tests

EN 60 068-2-6:	Vibration
Acceleration:	± 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
EN 60 068-2-27:	Shock
Acceleration:	3 × 50 g 3 shocks each in 6 directions
EN 60 068-2-1/-2/-3:	Cold, dry heat, damp heat
IEC 1000-4-2/-3/-4/-5/-6 EN 55 011:	Electromagnetic compatibility

Germanischer Lloyd

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

Output characteristic



Legend:

E	= Input
EA	= Input start value
EE	= Input end value
A	= Output
AA	= Output start value
AE	= Output end value

SINEAX F 534

Transducer for measuring frequency

Table 2: Specification and ordering information

Order Code 534 -		
Features, Selection	*SCODE	no-go
1. Mechanical design 4) Housing P13/70 for rail mounting		
2. Nominal input voltage 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	
3. Measuring range 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] 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		
4. Output signal 1) 0 ... 20 mA 2) 4 ... 20 mA 9) Non-standard [mA] 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] 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		
5. Power supply 1) 85 ... 230 V DC/AC 2) 24 ... 60 V DC/AC 3) Internal from measuring input (24 V AC to 60 V AC) 4) Internal from measuring input (85 V AC to 230 V AC) 5) Connect to the low tension 24 V AC / 24 ... 60 V DC	A	A
6. Response time 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		

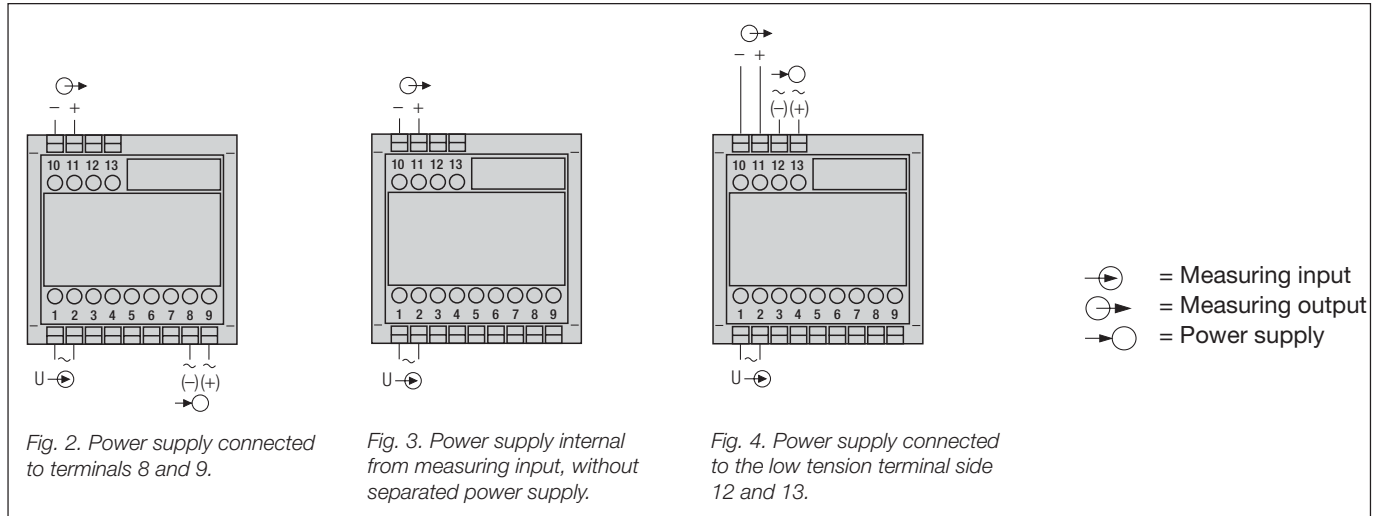
↑	↑	↑	↑	↑							
4	1	2	1	9	A	Z	1	2	3	4	5

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

SINEAX F 534

Transducer for measuring frequency

Electrical connections



Dimensional drawing

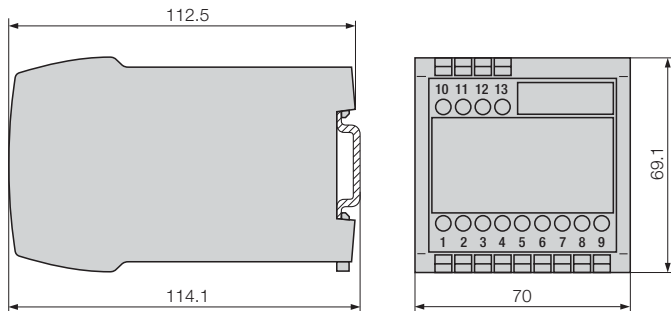


Fig. 5. Housing **P13/70** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022).

Standard accessories

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