

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 |
|---------------------|--------------|

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| | |
|-------------------|------------------------------|
| 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 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 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 | |

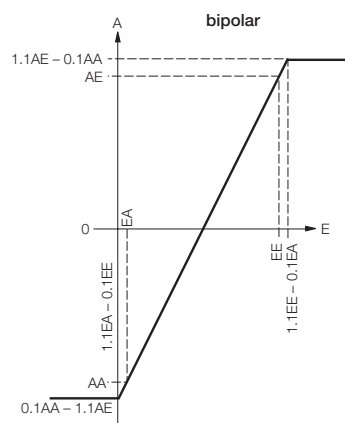
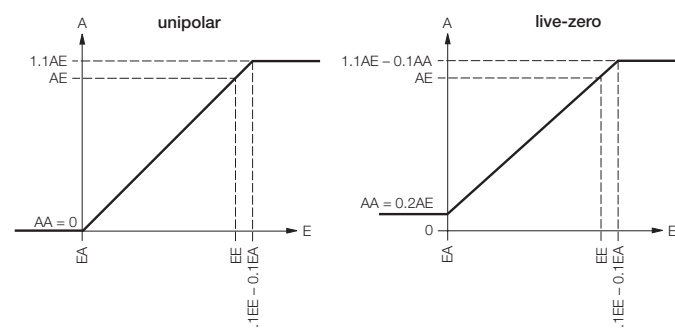
Ambient tests

| | |
|--|--|
| 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

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Table 2: Specification and ordering information

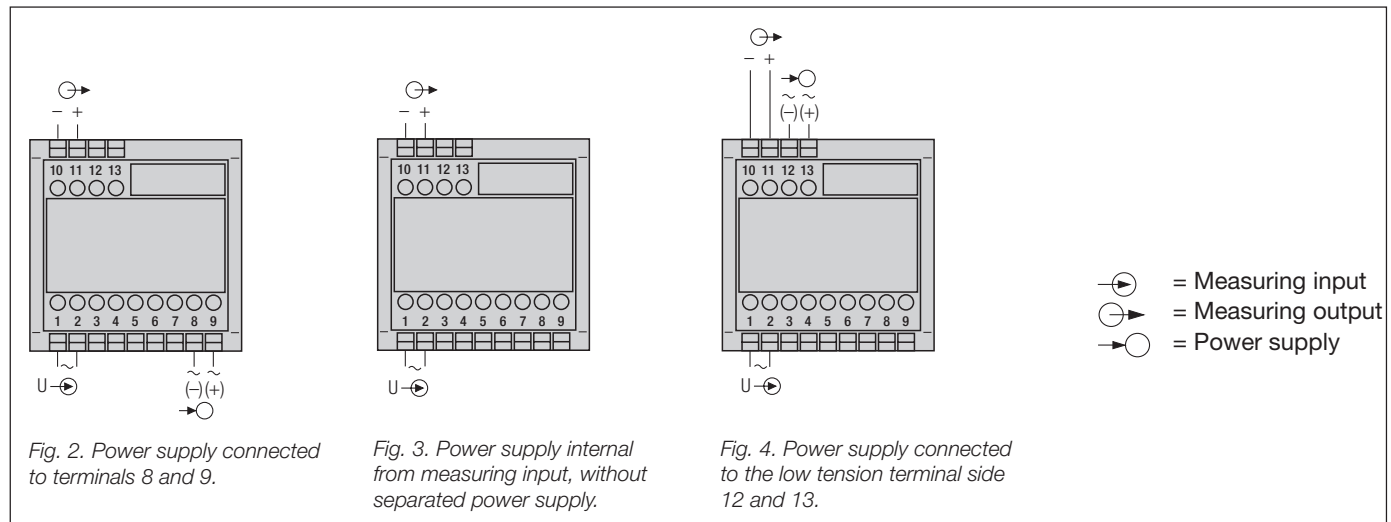
| Order Code 534 - | | | |
|---|--------|-------|-----------------------|
| Features, Selection | *SCODE | no-go | |
| 1. Mechanical design | | | ↑ ↑ ↑ ↑ ↑ |
| 4) Housing P13/70 for rail mounting | | | 4 |
| 2. Nominal input voltage | | | . 1 |
| 1) U_N : 10 ... 230 V | | | . 2 |
| 2) U_N : > 230 ... 690 V | A | | |
| 3 phase system: Input voltage = phase to phase voltage | | | |
| Line 2: Not possible with power supply from measuring input | | | |
| 3. Measuring range | | | . . . 1 |
| 1) 45 ... 50 ... 55 Hz | | | . . . 2 |
| 2) 47 ... 49 ... 51 Hz | | | . . . 3 |
| 3) 47.5 ... 50 ... 52.5 Hz | | | . . . 4 |
| 4) 48 ... 50 ... 52 Hz | | | . . . 5 |
| 5) 58 ... 60 ... 62 Hz | | | . . . 9 |
| 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 |
| 1) 0 ... 20 mA | | | 2 |
| 2) 4 ... 20 mA | | | 9 |
| 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 | | | A |
| Z) Non-standard [V] | | | Z |
| 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 |
| 1) 85 ... 230 V DC/AC | | | 2 |
| 2) 24 ... 60 V DC/AC | | | 3 |
| 3) Internal from measuring input (24 V AC to 60 V AC) | | A | 4 |
| 4) Internal from measuring input (85 V AC to 230 V AC) | | A | 5 |
| 5) Connect to the low tension 24 V AC / 24 ... 60 V DC | | | |
| 6. Response time | | | 1 |
| 1) 4 periods of the input frequency (standard) | | | 2 |
| 2) 2 periods of the input frequency | | | 3 |
| 3) 8 periods of the input frequency | | | 4 |
| 4) 16 periods of the input frequency | | | |

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

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Electrical connections



Dimensional drawing

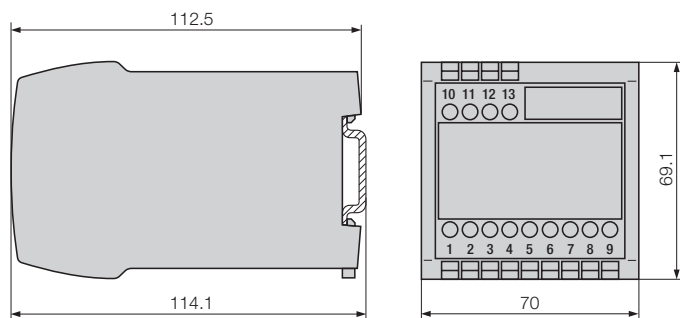


Fig. 5. Housing **P13/70** clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).

Standard accessories

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