

SINEAX VC 603, Programmable combined transmitter/alarm unit

for DC currents or voltages, temperature sensors, remote sensors or potentiometers



Application

The combined transmitter/alarm unit **SINEAX VC 603** (Fig. 1) converts the input variable – a DC current or voltage, or a signal from a thermo-couple, resistance thermometer, remote sensor or potentiometer – to a proportional analog output signal. It is also equipped with 2 limit contacts for monitoring the input variable.

The analog output signal is either an impressed current or superimposed voltage which is processed by other devices for purposes of displaying, recording and/or regulating a constant. The binary output signals of the two limit contact circuits are used for signalling out-of-limit conditions, control purposes and two-point regulation.

A considerable number of measuring ranges including bipolar or spread ranges are available.

Input variable and measuring range are programmed with the aid of a PC and the corresponding software. Other parameters relating to specific input variable data, the analog output signal, the transmission mode, the operating sense, the binary output signals and the open-circuit sensor supervision can also be programmed.

The open-circuit sensor supervision is in operation when the SINEAX VC 603 is used in conjunction with a thermo-couple, resistance thermometer, remote sensor or potentiometer.

The transmitter/alarm unit fulfils all the important requirements and regulations concerning electromagnetic compatibility **EMV** 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 / EN 29 001.

Production QA is also certified according to guideline 94/9/EG.

Features / Benefits

- **Input variable** (temperature, variation of resistance, DC signal) and **measuring range programmed using PC / Simplifies project planning and engineering** (the final measuring range can be determined during commissioning). **Short delivery times and low stocking levels**
- **Analog output signal and binary output signals also programmed on the PC** (analog: impressed current or superimposed voltage for all ranges between –20 and + 20 mA CC resp. –12 and + 15 V CC; binary: various functions associated with the limit contact circuits) / **Universally applicable. Short delivery times and low stocking levels**
- **Electrical insulation between measured variable, analog output signal, binary output signals and power supply / Safe isolation acc. to EN 61 010**
- **Wide power supply tolerance / Only two operating voltage ranges between 20 and a maximum of 264 V DC/AC**
- **Available in type of protection “Intrinsic safety” [EEx ia] IIC** (see “Table 7: Data on explosion protection”)
- **Ex devices also directly programmable on site / No supplementary Ex interface needed**
- **Standard version as per Germanischer Lloyd**
- **Provision for either snapping the transmitter/alarm unit onto top-hat rails or securing it with screws to a wall or panel**
- **Other programmable parameters: specific measured variable data** (e.g. two, three or four-wire connection for resistance thermometers, “internal” or “external” cold junction compensation of thermo-couples etc.), **transmission mode** (special linearised characteristic or characteristic determined by a mathematical relationship, e.g. output signal = f (measured variable)), **operating sense** (output signal directly or inversely proportional to the measured variable) and **open-circuit sensor supervision** (output signal assumes fixed preset value between –10 and 110%, supplementary output contact signalling relay) / **Highly flexible solutions for measurement problems**

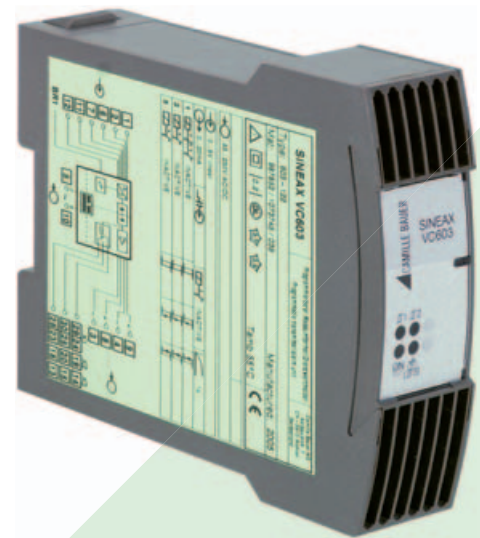


Fig. 1. SINEAX VC 603 in housing S35.

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- All programming operations by IBM XT, AT or compatible PC running the self-explanatory, menu-controlled programming software, if necessary during operation / No ancillary hand-held terminals needed
- Digital measured variable data available at the programming interface / Simplifies commissioning, measured variable and signals can be viewed on PC in the field
- Standard software includes functional test program / No external simulator or signal injection necessary
- Self-monitoring function and continuously running test program / Automatic signalling of defects and device failure

Programming (Figs. 2 and 3)

A PC with RS 232 C interface (Windows 3.1x, 95, 98, NT or 2000), the programming cable PRKAB 600 and the configuration software VC 600 are required to program the transmitter/alarm unit. (Details of the programming cable and the software are to be found in the separate data sheet: PRKAB 600 Ld.)

The connections between "PC ↔ PRKAB 600 ↔ SINEAX VC 603" can be seen from Fig. 3. The power supply must be applied to SINEAX VC 603 before it can be programmed.

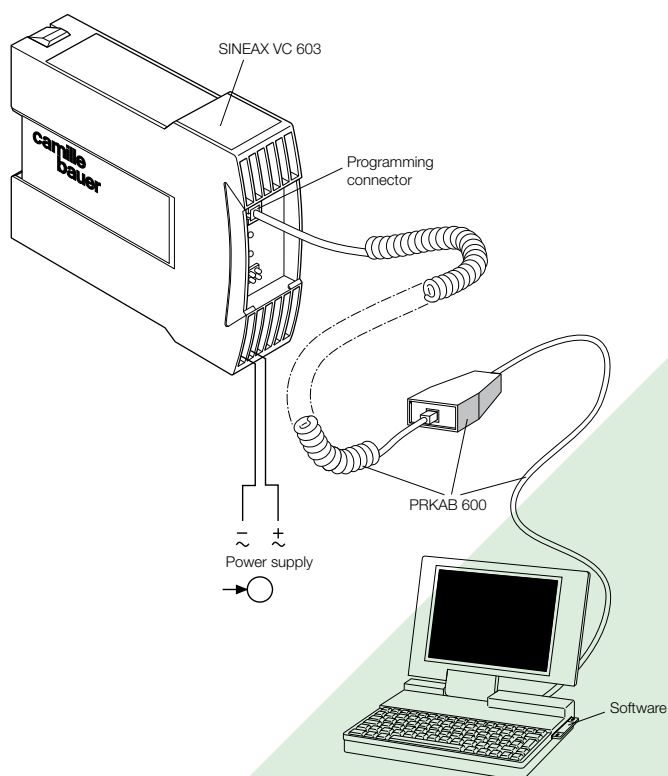


Fig. 2

A suitable PC is an IBM XT, AT or compatible.

The software VC 600 is supplied on a CD.

The programming cable PRKAB 600 adjusts the signal level and provides the electrical insulation between the PC and the transmitter/alarm unit SINEAX VC 603.

The programming cable PRKAB 600 is used for programming both standard and Ex versions.

Of the programmable details listed in section "Features/Benefits", **one** parameter – the **output signal** – has to be determined by PC programming as well as mechanical setting on the transmitter/alarm unit ...

... the output signal **range by PC**

... the **type** of output (current or voltage signal) has to be set by **DIP switch** (see Fig. 3).

The eight pole DIP switch is located on the PCB in the SINEAX VC 603.

DIP switches	Type of output signal
	impressed current
	superimposed voltage

Fig. 3

Technical data

Measuring input

Measured variable M

The measured variable M and the measuring range can be programmed

Table 1: Measured variables and measuring ranges

Measured variables	Measuring ranges		
	Limits	Min. span	Max. span
DC voltages	direct input	$\pm 300 \text{ mV}^1$	2 mV / 300 mV
	via potential divider ²	$\pm 40 \text{ V}^1$	300 mV / 40 V
DC currents	low current range	$\pm 12 \text{ mA}^1$	0.08 mA / 12 mA
	high current range	- 50 to + 100 mA ¹	0.75 mA / 100 mA
Temperature monitored by two, three or four-wire resistance thermometers		- 200 bis 850 °C	
	low resistance range	0...740 Ω^1	8 Ω / 740 Ω
	high resistance range	0...5000 Ω^1	40 Ω / 5000 Ω

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Measured variables	Measuring ranges		
	Limits	Min. span	Max. span
Temperature monitored by thermo-couples	- 270 to 1820 °C	2 mV	300 mV
Variation of resistance of remote sensors/potentiometers			
low resistance range	0...740 Ω ¹	8 Ω	740 Ω
high resistance range	0...5000 Ω ¹	40 Ω	5000 Ω

DC voltage

Measuring range:	See Table 1
Direct input:	Wiring diagram No. 1 ³
Input resistance:	R _i > 10 MΩ Continuous overload max. -1.5 V, + 5 V
Input via potential divider:	Wiring diagram No. 2 ³
Input resistance:	R _i = 1 MΩ Continuous overload max. ± 100 V

DC current

Measuring range:	See Table 1
Low currents:	Wiring diagram No. 3 ³
Input resistance:	R _i = 24.7 Ω Continuous overload max. 150 mA
High currents:	Wiring diagram No. 3 ³
Input resistance:	R _i = 24.7 Ω Continuous overload max. 150 mA

Resistance thermometer

Measuring range:	See Tables 1 and 8
Resistance types:	Type Pt 100 (DIN IEC 751) Type Ni 100 (DIN 43 760) Type Pt 20/20 °C Type Cu 10/25 °C Type Cu 20/25 °C See "Table 6: Specification and ordering information", feature 6 for other Pt or Ni.
Measuring current:	≤ 0.38 mA for measuring range 0...740 Ω or ≤ 0.06 mA for measuring range 0...5000 Ω

Standard circuit:

- 1 resistance thermometer:
 - two-wire connection, wiring diagram No. 4³
 - three-wire connection, wiring diagram No. 5³
 - four-wire connection, wiring diagram No. 6³

Summation circuit:

Series of parallel connection of 2 or more two, three or four-wire resistance thermometers for deriving the mean temperature or for matching other types of sensors, wiring diagram Nos. 4 – 6³

Differential circuit:

2 identical three-wire resistance thermometers for deriving the mean temperature RT1-RT2, wiring diagram No. 7³

Input resistance:

R_i > 10 MΩ

Lead resistance:

≤ 30 Ω per lead

Thermo-couples

Measuring range:

See tables 1 and 8

Thermo-couple pairs:

Type B: Pt30Rh-Pt6Rh (IEC 584)
Type E: NiCr-CuNi (IEC 584)
Type J: Fe-CuNi (IEC 584)
Type K: NiCr-Ni (IEC 584)
Type L: Fe-CuNi (DIN 43710)
Type N: NiCrSi-NiSi (IEC 584)
Type R: Pt13Rh-Pt (IEC 584)
Type S: Pt10Rh-Pt (IEC 584)
Type T: Cu-CuNi (IEC 584)
Type U: Cu-CuNi (DIN 43710)
Type W5-W26 Re

Other thermo-couple pairs on request

Standard circuits:

1 thermo-couple, internal cold junction compensation, wiring diagram No. 8³

1 thermo-couple, external cold junction compensation, wiring diagram No. 9³

Summation circuit:

2 or more thermo-couples in a summation circuit for deriving the mean temperature, external cold junction compensation, wiring diagram No. 10³

Differential circuit:

2 identical thermo-couples in a differential circuit for deriving the mean temperature TC1-TC2, no provision for cold junction compensation, wiring diagram No. 11³

Input resistance:

R_i > 10 MΩ

¹ Note permissible value of the ratio "full-scale value/span ≤ 20".

² Max. 30 V for Ex version with I.S. measuring input.

³ See "Table 9: Measuring input".

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Cold junction compensation: Internal or external

Internal: Incorporated Ni 100

Permissible variation of the internal cold junction compensation: ± 0.5 K at 23 °C, ± 0.25 K/10 K

External: 0...70 °C, programmable

Resistance sensor, potentiometer

Measuring range: See Table 1

Resistance sensor types: Type WF
Type WF DIN
Potentiometer see "Table 6: Specification and ordering information" feature 5.

Measuring current: ≤ 0.38 mA for measuring range 0...740 Ω
or
 ≤ 0.06 mA for measuring range 0...5000 Ω

Kinds of input: 1 resistance sensor WF current measured at pick-up, wiring diagram No. 12¹
1 resistance sensor WF DIN current measured at pick-up, wiring diagram No. 13¹
1 resistance sensor for two, three or four-wire connection, wiring diagram Nos. 4–6¹
2 identical three-wire resistance sensors for deriving a differential, wiring diagram No. 7¹

Input resistance: $R_i > 10$ M Ω

Lead resistance: ≤ 30 Ω per lead

Measuring output

Output signals A1 and A2

The output signals available at A1 and A2 can be configured for either an impressed DC current I_A or a superimposed DC voltage U_A by appropriately setting DIP switches. The desired range is programmed using a PC. A1 and A2 are not DC isolated and exhibit the same value.

Standard ranges for I_A : 0...20 mA or 4...20 mA

Non-standard ranges: Limite -22 to + 22 mA
Min. span 5 mA
Max. span 40 mA

Open-circuit voltage: Neg. -13.2...-18 V,
pos. 16.5...21 V

Burden voltage I_{A1} : + 15 V, resp. -12 V

External resistance I_{A1} :

$$R_{\text{ext max.}} [\text{k}\Omega] = \frac{15 \text{ V}}{I_{\text{AN}} [\text{mA}]}$$

$$\text{resp.} = \frac{-12 \text{ V}}{I_{\text{AN}} [\text{mA}]}$$

I_{AN} = Full-scale output current

Burden voltage I_{A2} :

< 0.3 V

External resistance I_{A2} :

$$R_{\text{ext max.}} [\text{k}\Omega] = \frac{0.3 \text{ V}}{I_{\text{AN}} [\text{mA}]}$$

Residual ripple:

< 1% p.p., DC ... 10 kHz
< 1.5% p.p. for an output span
< 10 mA

Standard ranges for U_A :

0...5, 1...5, 0...10 or 2...10 V

Non-standard ranges:

Limits -12 to + 15 V
Min. span 4 V
Max. span 27 V

Short-circuit current:

≤ 40 mA

Load-capacity U_{A1} / U_{A2} :

20 mA

Load resistance U_{A1} / U_{A2} :

$$R_{\text{ext}} [\text{k}\Omega] \geq \frac{U_A [\text{V}]}{20 \text{ mA}}$$

Residual ripple:

< 1% p.p., DC ... 10 kHz
< 1.5% p.p. for an output span
< 8 V

Fixed settings for the output signals A1 and A2

After switching on:

A1 and A2 are at a fixed value for 5 s after switching on (default).

Setting range between -10 and 110%² programmable, e.g. between 2.4 and 21.6 mA (for a scale of 4 to 20 mA).

The green LED ON flashes for 5 s

When input variable out of limits:

A1 and A2 are at either a lower or an upper fixed value when the input variable ...

... falls more than 10% below the minimum value of the permissible range


... exceeds the maximum value of the permissible range by more than 10%.

Lower fixed value = -10%², e.g. -2 mA (for a scale of 0 to 20 mA).

Upper fixed value = 110%², e.g. 22 mA (for a scale of 0 to 20 mA).

The green LED ON flashes

Open-circuit sensor:

A1 and A2 are at a fixed value when an open-circuit sensor is detected (see Section "Sensor and open-circuit lead supervision ").

¹ See "Table 9: Measuring input"

² In relation to analog output span A1 resp. A2.

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Open-circuit sensor (continuation):

The fixed value of A1 and A2 is configured to either maintain the value at the instant the open-circuit occurs or adopt a preset value between -10 and 110%¹ e.g. between 1.2 and 10.8 V (for a scale of 2 to 10 V).
The green LED ON flashes and the red LED \rightarrow lights continuously

Operating sense:

Programmable output signal directly or inversely proportional to measured variable

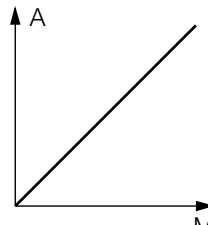
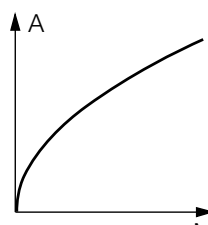
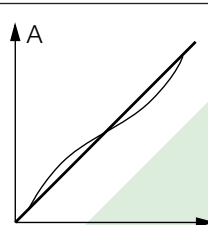
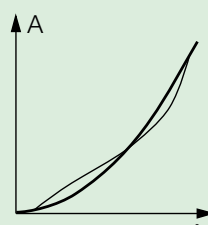
Setting time (IEC 770):

Programmable from 2 to 30 s

Output characteristic

Characteristic: Programmable

Table 2: Available characteristics (acc. to measured variable)

Measured variables	Characteristics
DC voltage	
DC current	
Resistance thermometer (linear variation of resistance)	
Thermo-couple (linear variation of voltage)	
Sensor or potentiometer	$A = M$
DC voltage	
DC current	
DC voltage	
DC current	
Resistance thermometer (linear variation with temperature)	
Thermo-couple signal (linear variation with temperature)	
Sensor or potentiometer	$A = f(M)^2$ linearisiert
DC voltage	
DC current	
Sensor or potentiometer	

Special characteristics

Power supply H \rightarrow \bigcirc

DC, AC power pack (DC and 45...400 Hz)

Table 3: Nominal voltage and tolerance

Nominal voltage U_N	Tolerance	Instrument version
24 ... 60 V DC/AC	DC - 15...+ 33%	Standard (Non-Ex)
85 ... 230 V ⁴ DC/AC	AC \pm 15%	
24 ... 60 V DC/AC	DC - 15...+ 33%	Type of protection "Intrinsic safety" [Ex ia] IIC
85 ... 230 V AC	\pm 10%	
85 ... 110 V DC	- 15...+ 10%	

Power consumption:

≤ 2.2 W resp. ≤ 4.2 VA

Open-circuit sensor circuits supervision \rightarrow

Resistance thermometers, thermo-couples, remote sensors and potentiometer input circuits are supervised. The circuits of DC voltage and current inputs are not supervised.

Pick-up/reset level:

1 to 15 k Ω , acc. to kind of measurement and range

Signalling mode

Output signals A1 and A2:

Programmable fixed values. The fixed value of A1 and A2 is configured to either maintain their values at the instant the open-circuit occurs or adopt a preset value between -10 and 110%¹, e.g. between 1.2 and 10.8 V (for a scale of 2 to 10 V)

¹ In relation to analog output span A1 resp. A2.

² 25 input points M given referred to a linear output scale from -10% to + 110% in steps of 5%.

³ 25 input points M given referred to a quadratic output scale from -10% to + 110%. Pre-define output points: 0, 0, 0, 0.25, 1, 2.25, 4.00, 6.25, 9.00, 12.25, 16.00, 20.25, 25.00, 30.25, 36.00, 42.25, 49.00, 56.25, 64.00, 72.25, 81.00, 90.25, 100.0, 110.0, 110.0%.

⁴ An external supply fuse must be provided for DC supply voltages >125 V.

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Frontplate signals: The green LED ON flashes and the red LED \rightarrow lights continuously

Output contact K3: **Relay 3** 1 potentially-free changeover contact (see Table 4)
 Operating sense programmable
 The relay can be either energised or de-energised in the case of a disturbance.
 Set to "relay disabled" if not required!

Output contacts for alarm unit J1 , J2 , (J3)

Binary output signals K1, K2, K3

Output contact K1: **Relay 1** 2 potentially-free changeover contacts (see Table 4)

Output contact K2: **Relay 2** 1 potentially-free changeover contact (see Table 4)

Output contact K3: **Relay 3** 1 potentially-free changeover contact (see Table 4)

K3 is only available, providing it is **not** being used for open-circuit sensor supervision (see Section "Open-circuit sensor circuit supervision \rightarrow »). This applies ...

... in all cases when the measured variable is a DC voltage or current

... when the measured variable is a resistance thermometer, a thermo-couple, a remote sensor or a potentiometer and the relay is set to "**Relay disabled**"

Limit type:

- Programmable
- Disabled
 - Lower limit value of the measured variable (see Fig. 4, left)
 - Upper limit value of the measured variable (see Fig. 4, left)
 - Maximum rate-of-change of the measured variable

$$\text{Slope} = \frac{\Delta \text{ measured variable}}{\Delta t}$$

(see Fig. 4, right)

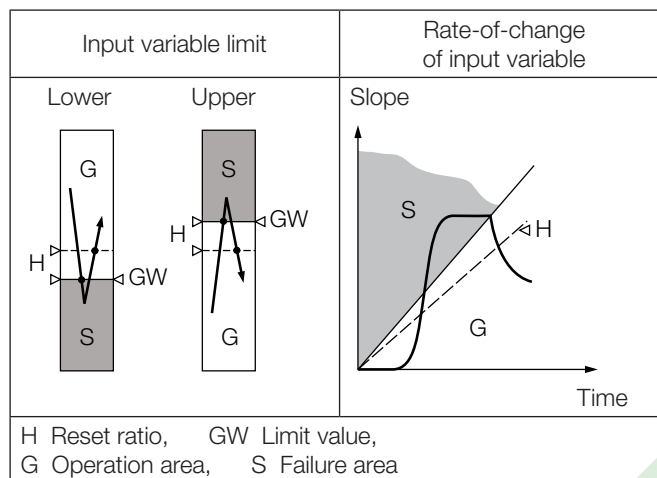


Fig. 4. Switching function according to limit monitored.

Trip point setting **using PC** for GW1, GW2 and GW3:

- Programmable
- between -10 and 110%¹ (of the measured variable)
 - between ± 1 and $\pm 50\%$ /s (of the rate-of-change of the measured variable)

Trip point setting **using potentiometer** \otimes J1 and \otimes J2 for GW1 and GW2:

- Programmed to
- Relative ($\pm 10\%$)
Setting range $\pm 10\%$ referred to the set limit
 - Absolute (0 ... 100%)
Setting range 0 ... 100%

Hysteresis:

- Programmable
- between 0.5 and 100%¹ (of the measured variable)
 - between 1 and 100%¹/s (of the rate-of-change of the measured variable)

Operating and resetting delays:

- Programmable
- from 1 to 60 s

Operating sense:

- Programmable
- Relay energised, LED on
 - Relay energised, LED off
 - Relay de-energised, LED on
 - Relay de-energised, LED off (once limit reached)

Relay status signal:

GW1 and GW2 by yellow LED's J1 and J2 , GW3 by red LED (J3)

¹ In relation to analog output span A1 resp. A2.

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Table 4: Contact arrangement and data

	Symbole	Material	Contact rating
Relay 1		Gold flashed silver alloy	AC: $\leq 2 \text{ A}/250 \text{ V}$ (500 VA) DC: $\leq 1 \text{ A}/0,1 \dots 250 \text{ V}$ (30 W)
Relay 2 and 3			

Relay approved by UL, CSA, TÜV, SEV

Programming connector

Interface:	RS 232 C
FCC-68 socket:	6/6 pin
Signal level:	TTL (0/5 V)
Power consumption:	Approx. 50 mW

Accuracy data (acc. to DIN/IEC 770)

Basic accuracy:	Max. error $\leq \pm 0.2\%$ Including linearity and repeatability errors for current, voltage and resistance measurement
Additional error (additive):	$< \pm 0.3\%$ for linearised characteristic
	$< \pm 0.3\%$ for measuring ranges $< 5 \text{ mV}$, $0.3 \dots 0.75 \text{ V}$, $< 0.2 \text{ mA}$ or $< 20 \Omega$
	$< \pm 0.3\%$ for a high ratio between full-scale value and measuring range $> \text{factor } 10$, e.g. Pt 100 $175.84 \Omega \dots 194.07 \Omega$ $\cong 200 \text{ }^\circ\text{C} \dots 250 \text{ }^\circ\text{C}$
	$< \pm 0.3\%$ for current output $< 10 \text{ mA}$ span
	$< \pm 0.3\%$ for voltage output $< 8 \text{ V}$ span
	$< 2 \cdot (\text{basic and additional error})$ for two-wire resistance measurement

Reference conditions:

Ambient temperature	$23 \text{ }^\circ\text{C}$, $\pm 2 \text{ K}$
Power supply	$24 \text{ V DC} \pm 10\%$ and $230 \text{ V AC} \pm 10\%$
Output burden	Current: $0.5 \cdot R_{\text{ext}}$ max. Voltage: $2 \cdot R_{\text{ext}}$ min.

Influencing factors:

Temperature	$< \pm 0.1 \dots 0.15\%$ per 10 K
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Burden	$< \pm 0.1\%$ for current output $< 0.2\%$ for voltage output, providing $R_{\text{ext}} > 2 \cdot R_{\text{ext min}}$.
Long-time drift	$< \pm 0.3\%$ / 12 months
Switch-on drift	$< \pm 0.5\%$
Common and transverse mode influence	$< \pm 0.2\%$
+ or – to ground:	$< \pm 0.2\%$

Installation data

Housing:	Housing type S35 Refer to Section "Dimensional drawings" for dimensions
Material of housing:	Lexan 940 (polycarbonate) Flammability class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen
Mounting:	For snapping onto top-hat rail ($35 \times 15 \text{ mm}$ or $35 \times 7.5 \text{ mm}$) acc. to EN 50 022 or directly onto a wall or panel using the pull-out screw hole brackets
Mounting position:	Any
Terminals:	DIN/VDE 0609 Screw terminals with wire guards for light PVC wiring and max. $2 \times 0.75 \text{ mm}^2$ or $1 \times 2.5 \text{ mm}^2$
Permissible vibrations:	2 g acc. to EN 60 068-2-6 $10 \dots 150 \dots 10 \text{ Hz}$ 10 cycles
Shock:	$3 \times 50 \text{ g}$ 3 shocks each in 6 directions acc. to EN 60 068-2-27
Weight:	Approx. 0.32 kg

Electrical insulation:

All circuits (measuring input/measuring output/power supply/output contacts) are electrically insulated. Programming connector and measuring input are connected. The PC is electrically insulated by the programming cable PRKAB 600.

Standards

Electromagnetic compatibility:	The standards DIN EN 50 081-2 and DIN EN 60 082-2 are observed
Intrinsically safe:	Acc. to DIN EN 50 020: 1996-04

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Protection (acc. to IEC 529 resp. EN 60 529):	Housing IP 40 Terminals IP 20	Test voltage (continuation):	– output contacts 2.3 kV, 50 Hz, 1 min.
Electrical design:	Acc. to IEC 1010 resp. EN 61 010		Measuring outputs to:
Operating voltages:	Measuring input < 40 V Programming connector, measuring outputs < 25 V Output contacts, power supply < 250 V		– power supply 3.7 kV, 50 Hz, 1 min. – output contacts 2.3 kV, 50 Hz, 1 min.
Rated insulation voltage:	Measuring input, programming connector, measuring outputs, output contacts, power supply < 250 V		Serial interface for the PC to: – everything else 4 kV, 50 Hz, 1 min. (PRKAB 600)
Pollution degree:	2	Ambient conditions	
Installation category II:	Measuring input, programming connector, measuring outputs, output contacts	Commissioning temperature:	–10 to + 55 °C
Installation category III:	Power supply	Operating temperature:	–25 to + 55 °C, Ex –20 to + 55 °C
Test voltage:	Measuring input and programming connector to: – output signal 2.3 kV, 50 Hz, 1 min. – power supply 3.7 kV, 50 Hz, 1 min.	Storage temperature:	–40 to + 70 °C
		Relative humidity annual mean:	≤ 75% standard climatic rating ≤ 95% enhanced climatic rating
		Altitude:	2000 m max.
		Indoor use statement!	

Basic configuration

The transmitter/alarm unit SINEAX VC 603 is also available already programmed with a **basic** configuration which is especially recommended in cases where the programming data is not known at the time of ordering (see “Table 6: Specification and ordering information”, feature 4).

SINEAX VC 603 supplied as standard versions are programmed for **basic** configuration (see “Table 5: Standard versions”).

Basic configuration:	Measuring input 0...5 V DC Measuring output 0...20 mA linear, fixed value 0% during 5 s after switching on Setting time 0.7 s Open-circuit supervision inactive Mains ripple suppression 50 Hz Limit functions inactive
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Table 5: Standard versions

The following 4 transmitter/alarm unit versions are already programmed for **basic** configuration and are available ex stock. It is only necessary to quote the **Order No.**:

Cold junction compensation	Climatic rating	Instrument	Power supply	Order Code	Order No.
included	standard	Standard version	24 ... 60 V DC/AC	603-1120	987 670
			85 ... 230 V DC/AC	603-1220	987 852
		[Ex ia] IIC version, measuring circuit I.S.	24 ... 60 V DC/AC	603-1320	987 894
			85 ... 110 V DC/ 85 ... 230 V AC	603-1420	987 935

The complete Order Code 603-...0 and/or a description should be stated for other versions with the basic works configuration (see “Table 6: Specification and ordering information”)

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Table 6: Specification and ordering information (see also "Table 5: Standard versions")

Description	*Blocking code	no-go with blocking code	Article No./ Feature
SINEAX VC 603 Order code VC 603 - xxxx xxxx xxxx xxxx xxx			603 –
Features, Selection			
1. Mechanical design Carrying rail housing S35			1
2. Version / Power supply H (nominal voltage U_N)			
Standard / 24 ... 60 V DC/AC			1
Standard / 85 ... 230 V DC/AC			2
[EEx ia] IIC / 24 ... 60 V DC/AC			3
[EEx ia] IIC / 85 ... 110 V DC, 85 ... 230 V AC			4
Lines 3 and 4: Device [EEx ia] IIC, measuring circuit EEx ia IIC			
3. Climatic rating / Cold junction compensation			
Standard climatic rating; instrument with cold junction compensation			2
Extra climatic rating; instrument with cold junction compensation			4
4. Configuration			
Basic configuration, programmed (no test certificate) If you wish to order the basic configuration, the line "0" must be selected for options 4 to 19, i.e. all the digits of the order code after the 4th. are zeros, see "Table 5: Standard versions"!	Z		0
Programmed to order (no test certificate)			1
Programmed to order with test certificate			2
5. Measured variable / Measuring input M			
DC voltage			
0 ... 5 V linear	C		0
1 ... 5 V linear	C	Z	1
0 ... 10 V linear	C	Z	2
2 ... 10 V linear	C	Z	3
Linear input, other ranges [V]	C	Z	4
Square root input function [V]	C	Z	5
Input x 3/2 [V]	C	Z	6
Lines 4 to 6: DC [V] 0...0.002 to 0...≤ 40 V (Ex max. 30 V) or span 0.002 to 40 V between – 40 and 40 V, ratio full-scale/span ≤ 20			
DC current			
0 ... 20 mA linear	C	Z	7
4 ... 20 mA linear	C	Z	8
Linear input, other ranges [mA]	C	Z	9
Square root input function [mA]	C	Z	A
Input x 3/2 [mA]	C	Z	B
Lines 9, A and B: DC [mA] 0...0.08 to 0...100 mA or span 0.08 to 100 mA between – 50 and 100 mA, ratio full-scale/span ≤ 20			

SINEAX VC 603, Programmable combined transmitter/alarm unit

Description	*Blocking code	no-go with blocking code	Article No./ Feature
SINEAX VC 603 Order code VC 603 - xxxx xxxx xxxx xxxx xxx			603 –
Features, Selection			
5. Measured variable / Measuring input M (continuation)			
Resistance sensor / Potentiometer			
WF, $R_L \leq 30 \Omega/\text{wire}$	Measuring range [Ω]		F Z R
WF DIN, $R_L \leq 30 \Omega/\text{wire}$	Measuring range [Ω]		F Z S
Potentiometer two-wire connection	Measuring range [Ω] and R_L [Ω]		F Z T
Specify total lead resistance R_L [Ω], any value between 0 and 60 Ω . This may be omitted, because two leads can be compensated automatically on site.			
Potentiometer, three-wire connection $R_L \leq 30 \Omega/\text{wire}$	Measuring range [Ω]		F Z U
Potentiometer, four-wire connection $R_L \leq 30 \Omega/\text{wire}$	Measuring range [Ω]		F Z V
Lines R to V: Specify initial resistance, span and residual resistance in Ω , example: 200...600...200; 0...500...0; 10...80...20. Minimum span at full-scale value ME: 8 Ω for $ME \leq 740 \Omega$; 40 Ω for $ME > 740 \Omega$. Max. resistance value (initial value + span + lead resistance) 5000 Ω . Note! Initial measuring range < 10 x span			
Special characteristic			
For special characteristic	[M] [mA] [Ω]		Z Z
Fill in Table W 2357 e for special characteristic for V, mA or Ω .			
6. Sensor type / Temperature range			
No temperature measurement			0
Pt 100	[$^{\circ}\text{C}$]		CDFZ 1
Ni 100	[$^{\circ}\text{C}$]		CDFZ 2
Other Pt [Ω]	[$^{\circ}\text{C}$]		CDFZ 3
Other Ni [Ω]	[$^{\circ}\text{C}$]		CDFZ 4
Pt 20 / 20 $^{\circ}\text{C}$	[$^{\circ}\text{C}$]		CDFZ 5
Cu 10 / 25 $^{\circ}\text{C}$	[$^{\circ}\text{C}$]		CDFZ 6
Lines 1 to 6: Specify measuring range in [$^{\circ}\text{C}$] or $^{\circ}\text{F}$, refer to Table 8 for the operating limits for each type of sensors. For temperature difference measurement: specify measuring range and reference temperature for 2nd sensor (t_{\min} ; t_{\max} ; $t_{\text{reference}}$) e.g. 100; 250; 150. Lines 3 and 4: Specify resistance in Ω at 0°C , permissible values are 100 and 1000, multiplied or divided by a whole number, e.g. $1000:4 = 250$, $100:2 = 50$ or $100 \times 3 = 300$.			

SINEAX VC 603, Programmable combined transmitter/alarm unit

Description	*Blocking code	no-go with blocking code	Article No./ Feature
SINEAX VC 603 Order code VC 603 - xxxx xxxx xxxx xxx			603 –
Features, Selection			
6. Sensor type / Temperature range (continuation)			
Type B Pt30Rh-Pt6Rh [°C]		CEFTZ	B
Type E NiCr-CuNi [°C]		CEFZ	E
Type J Fe-CuNi [°C]		CEFZ	J
Type K NiCr-Ni [°C]		CEFZ	K
Type L Fe-CuNi [°C]		CEFZ	L
Type N NiCrSi-NiSi [°C]		CEFZ	N
Type R Pt13Rh-Pt [°C]		CEFZ	R
Type S Pt10Rh-Pt [°C]		CEFZ	S
Type T Cu-CuNi [°C]		CEFZ	T
Type U Cu-CuNi [°C]		CEFZ	U
Type W5-W26Re [°C]		CEFZ	W
Lines B to W; Specify measuring range [°C] or °F, refer to Table 8 for the operating limits for each type of sensor..			
For temperature difference measurement: specify measuring range and reference temperature for 2nd sensor (t_{min} ; t_{max} ; $t_{referenz}$) e.g. 100; 250; 150.			
7. Output signal / Measuring output A1*			
0 ... 20 mA, $R_{ext} \leq 750 \Omega$			0
4 ... 20 mA, $R_{ext} \leq 750 \Omega$		Z	1
Non-standard (- 22 to + 22, span 5 to 40 mA) [mA]		Z	2
0 ... 5 V, $R_{ext} \geq 250 \Omega$		Z	3
1 ... 5 V, $R_{ext} \geq 250 \Omega$		Z	4
0 ... 10 V, $R_{ext} \geq 500 \Omega$		Z	5
2 ... 10 V, $R_{ext} \geq 500 \Omega$		Z	6
Non-standard (- 12 to + 15, span 4 to 27 V) [V]		Z	7
8. Output characteristic			
Directly proportional, initial start-up value 0%			0
Inversely proportional, initial start-up value 100%		Z	1
Directly proportional, initial start-up value [%]		Z	2
Inversely proportional, initial start-up value [%]		Z	3

* 2nd output signal A2 for field indicator only.

SINEAX VC 603, Programmable combined transmitter/alarm unit

Description	*Blocking code	no-go with blocking code	Article No./ Feature
SINEAX VC 603 Order code VC 603 - xxxx xxxx xxxx xxxx xxx			603 –
Features, Selection			
9. Output time response			
Rated setting time approx. 1 s			0
Others (any whole number from 2 to 30 s) [s]		Z	1
10. Open-circuit sensor signalling			
Without / open-circuit sensor signal / relay / output signal A [%] corresponding to input variable [%]			
No sensor signal for current or voltage measurement		DEF	0
With sensor signal / relay disabled / output signal A %		CZ	1
With sensor signal / relay energized / output signal A %	K	CZ	2
With sensor signal / relay de-energized / output signal A %	K	CZ	3
With sensor signal / relay energized / hold A at last value	K	CZ	4
With sensor signal / relay de-energized / hold A at last value	K	CZ	5
Lines 1, 2 and 3: Specify value of output signal span in %, any value from – 10% to 110%, e.g. with output 4...20 mA corresponding 2.4 mA – 10% and 21.6 mA 110%			
Lines 2 to 5: Cannot be combined with active trip point GW3, feature 18, lines 1 to 3 and feature 19, lines 1 and 2			
11. Mains ripple suppression			
Frequency 50 Hz			0
Frequency 60 Hz		Z	1
12. Local setting of trip point GW1 (for output contact K1)			
Alarm function inactive		N	0
Trip point adjustable, potentiometer \square 1 – 10 ... + 10%	OP	Z	1
Trip point variable, potentiometer \square 1 0 ... 100%	OP	Z	2
Potentiometer \square 1 ineffective	O	Z	3
13. Type and value of trip point GW1 and reset ratio, energizing delay and de-energizing delay of relay 1 (for K1)			
Alarm function inactive		O	0
Low alarm [%; %; s; s]		NZ	1
High alarm [%; %; s; s]		NZ	2
Rate-of-change alarm $\delta x / \delta t$ [%/s; %; s; s]		NPZ	3
Lines 1 and 2: Trip point – 10 to 110%; reset ratio 0.5 to 100%			
Line 3: Tri point ± 1 to $\pm 50\%/s$; reset ratio 1 to 100%/s			
Lines 1 to 3: Energizing / de-energizing delay 1 to 60 s			
14. Sense of action of relay 1 (for GW1 resp. K1)			
Alarm function inactive		O	0
Relay energized in alarm condition / LED lit in alarm condition		NZ	1
Relay energized in alarm condition / LED lit in safe condition		NZ	2
Relay energized in safe condition / LED lit in alarm condition		NZ	3
Relay energized in safe condition / LED lit in safe condition		NZ	4

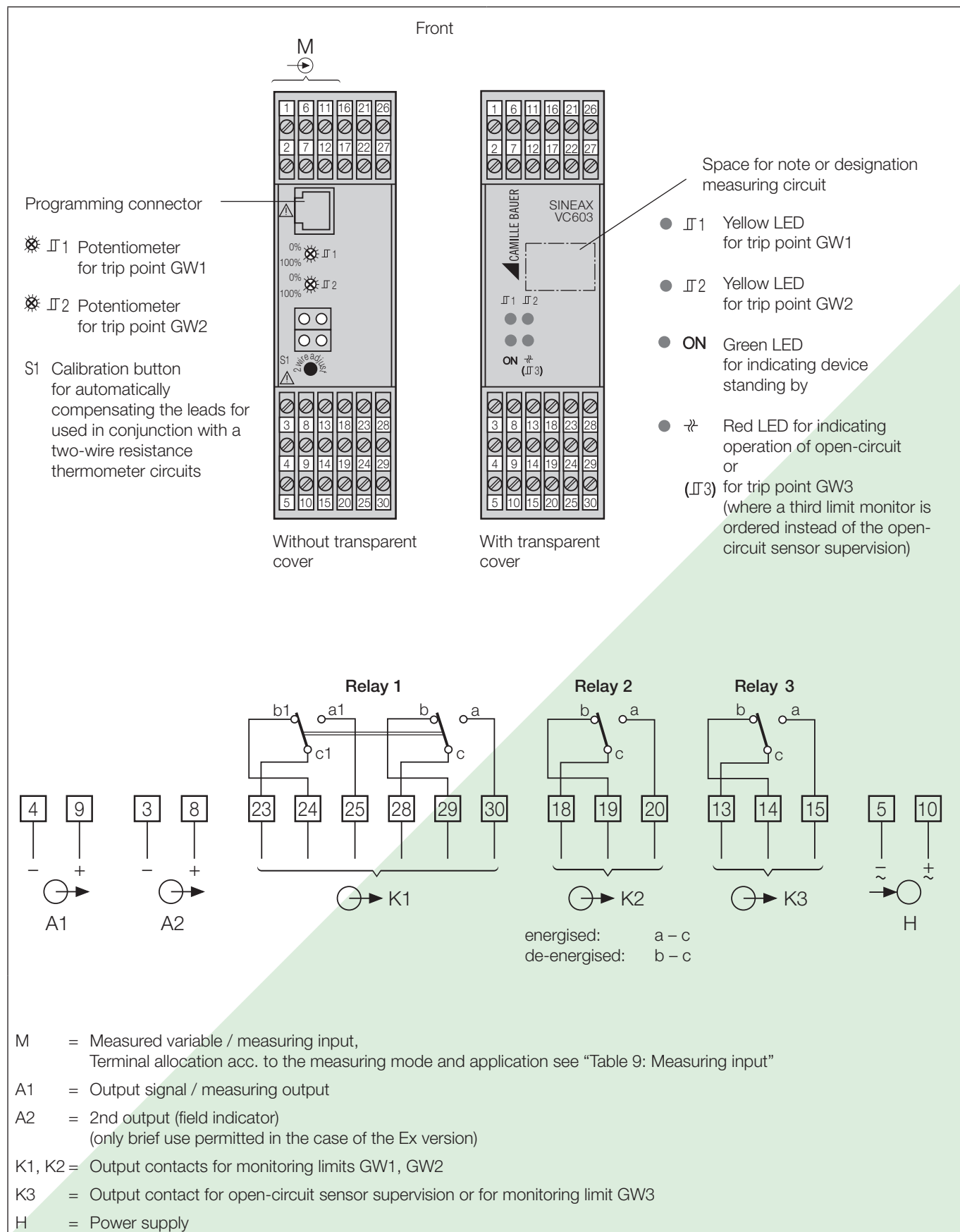
SINEAX VC 603, Programmable combined transmitter/alarm unit

Table 8: Temperature measuring ranges

Measuring range [°C]	Resistance thermometer		Thermo-couple									
	Pt100	Ni100	B	E	J	K	L	N	R	S	T	U
0 ... 20												
0 ... 25	X	X										
0 ... 40	X	X		X	X		X					
0 ... 50	X	X		X	X	X	X				X	X
0 ... 60	X	X		X	X	X	X				X	X
0 ... 80	X	X		X	X	X	X				X	X
0 ... 100	X	X		X	X	X	X	X			X	X
0 ... 120	X	X		X	X	X	X	X			X	X
0 ... 150	X	X		X	X	X	X	X			X	X
0 ... 200	X	X		X	X	X	X	X			X	X
0 ... 250	X	X		X	X	X	X	X			X	X
0 ... 300	X			X	X	X	X	X	X	X	X	X
0 ... 400	X			X	X	X	X	X	X	X	X	X
0 ... 500	X			X	X	X	X	X	X	X		X
0 ... 600	X			X	X	X	X	X	X	X		X
0 ... 800			X									
0 ... 900			X	X	X	X	X	X	X	X		
0 ... 1000			X	X	X	X		X	X	X		
0 ... 1200			X		X	X		X	X	X		
0 ... 1500			X						X	X		
0 ... 1600			X						X	X		
50 ... 150	X	X		X	X	X	X	X			X	X
100 ... 300	X			X	X	X	X	X			X	X
300 ... 600	X			X	X	X	X	X	X	X		X
600 ... 900			X	X	X	X	X	X	X	X		
600 ... 1000			X	X	X	X		X	X	X		
900 ... 1200			X		X	X		X	X	X		
600 ... 1600			X						X	X		
600 ... 1800			X									
-20 ... 20	X	X		X	X		X					
-10 ... 40	X	X		X	X	X	X					X
-30 ... 60	X	X		X	X	X	X	X			X	X
Measuring range limits [°C]	-200 to 850	-60 to 250	0 to 1820	-270 to 1000	-210 to 1200	-270 to 1372	-200 to 900	-270 to 1300	-50 to 1769	-50 to 1769	-270 to 400	-200 to 600
	ΔR min 8 Ω at full-scale $\leq 740 \Omega$ ΔR min 40 Ω at full-scale $> 740 \Omega$ to 5000 Ω		ΔU min 2 mV									

SINEAX VC 603, Programmable combined transmitter/alarm unit

Electrical connections



SINEAX VC 603, Programmable combined transmitter/alarm unit

Table 9: Measuring input

Measurement	Measuring range limits	Measuring span	No.	Wiring diagram Terminal arrangement
DC voltage (direct input)	- 300...0...300 mV	2...300 mV	1	
DC voltage (input via potential divider)	- 40...0...40 V	0.3...40 V	2	
DC current	- 12...0... 12 mA/ - 50...0...100 mA	0.08... 12 mA/ 0.75...100 mA	3	
Resistance thermometer RT or resistance measurement R, two-wire connection	0... 740 Ω/ 0...5000 Ω	8... 740 Ω/ 40...5000 Ω	4	
Resistance thermometer RT or resistance measurement R, three-wire connection	0... 740 Ω/ 0...5000 Ω	8... 740 Ω/ 40...5000 Ω	5	
Resistance thermometer RT or resistance measurement R, four-wire connection	0... 740 Ω/ 0...5000 Ω	8... 740 Ω/ 40...5000 Ω	6	
2 identical three-wire resistance transmitters RT for deriving the difference	RT1 – RT2 0... 740 Ω/ 0...5000 Ω	8... 740 Ω/ 40...5000 Ω	7	
Thermo-couple TC Cold junction compensation internal	- 300...0...300 mV	2...300 mV	8	
Thermo-couple TC Cold junction compensation external	- 300...0...300 mV	2...300 mV	9	
Thermo-couple TC in a summation circuit for deriving the mean temperature	- 300...0...300 mV	2...300 mV	10	
Thermo-couple TC in a differential circuit for deriving the mean temperature	TC1 – TC2 - 300...0...300 mV	2...300 mV	11	
Resistance sensor WF	0... 740 Ω/ 0...5000 Ω	8... 740 Ω/ 40...5000 Ω	12	
Resistance sensor WF DIN	0... 740 Ω/ 0...5000 Ω	8... 740 Ω/ 40...5000 Ω	13	

SINEAX VC 603, Programmable combined transmitter/alarm unit

Table 10: Accessories and spare parts

Description	Order No.
Programming cable PRKAB 600 for SINEAX/EURAX VC 603/V 604, SIRAX V 644 and SINEAX TV 809	147 787
Ancillary cable for SINEAX/EURAX VC 603/V 604 and SIRAX V 644	988 058
Configuration Software VC 600 for SINEAX/EURAX VC 603/V 604 and SIRAX V 644 Windows 3.1x, 95, 98, NT and 2000 incl. V 600 (Version 1.6, DOS) on CD in German, English, French and Dutch	146 557
(Download free of charge under http://www.camillebauer.com) In addition, the CD contains all configu- ration programmes presently available for Camille Bauer products.	
Pull-out handle (for removing device from its housing)	988 149
Front label (behind transparent cover)	973 489
Inscription label (green, for recording programmed settings)	120 626
Operating Instructions VC 603-1 Bdfc	988 074

Standard accessories

- 1 Operating Instructions in three languages: German, French, English
- 2 Pull-out handle (for removing device from its housing)
- 2 Front labels (behind transparent cover)
- 2 Inscription labels (green, for recording programmed settings)
- 1 Type examination certificate (only for "intrinsically safe" explosion-proof devices)

Dimensional drawings

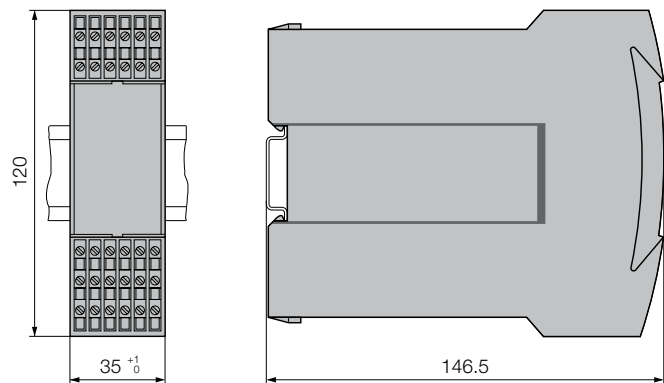


Fig. 5. SINEAX VC 603 in housing S35 clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).

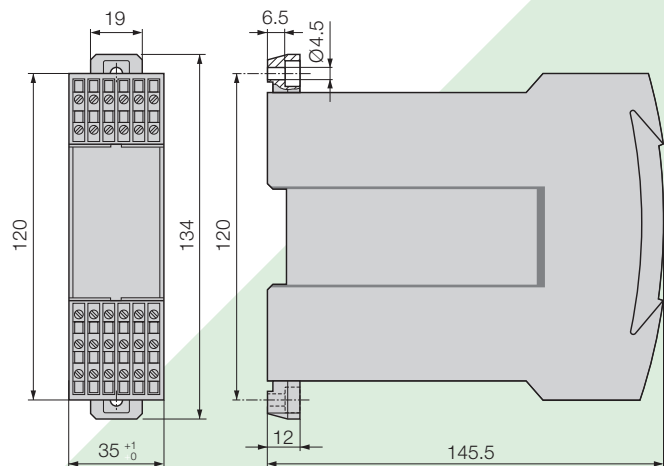


Fig. 6. SINEAX VC 603 in housing S35, with the screw hole brackets pulled out for wall mounting.

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