SINEAX VK 626
Programmable Temperature Transmitter for RTD and TC inputs, with HART protocol

for installation in the terminal head of a temperature sensor DIN 43 729, Shape B

CE 0102 Ex II 2 (1) G

Fig. 1. Measuring transmitter SINEAX VK 626 – 7A/7B, input/output electrically isolated.

Application

SINEAX VK 626 is a two-wire head-mounted transmitter. It is designed for **measuring temperature in combination with thermocouples or resistance thermometers**. Thermocouple non-linearities are automatically compensated. The output signal is a current in the range 4…20 mA.

Measured variable and measuring range are programmed using either a hand-held terminal (Communicator) or a PC with a suitable interface and running the programming software.

The sensor circuit is monitored for open and short-circuits and the output responds in a defined manner if one is detected.

The power supply of (12…30 V DC) is connected together with the signal by the two leads connected to the measurement output (loop powered).

Features / Benefits

- **Two-wire programming (HART protocol) of measured variable and measuring range**

Measured variables	Measuring ranges Limits	Min. span	Max. span
Temperatures with resistance thermometers for **two-, three-** or **four-**wire connection			
Pt 100, IEC 60 751	– 200 to 850 °C	50 K	850 K
Ni 100, DIN 43 760	– 60 to 250 °C	50 K	250 K
Temperatures with thermocouples			
Type B, E, J, K, N, R, S, T acc. to IEC 60 584-1	acc. to type	2 mV	80 mV
Type L and U, DIN 43 710			
Type W5 Re/W26 Re, Type W3 Re/W25 Re acc. to ASTM E 988-90			

- **Electrical isolation between input and output / Prevents measurement errors due to potential leakage**
- **Open and short-circuit sensor circuit supervision / Defined output response should the supervision pick up**
- **Terminals with captive screws**
- **Available in type of protection "Intrinsic safety" EEx ia IIC T6** (see "Table 2: Data on explosion protection")

Standard versions

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

Basic configuration:	Measuring input	Pt 100 for **three-**wire connection
	Measuring range	0 … 100 °C
	Measuring output:	4 … 20 mA, linearised with temperature
	Open-circuit supervision:	Output 21.6 mA

Table 1:

Version	Dimensions Ø 43 mm	Order Code	**Order No.**
Standard, electrically isolated	Height 30.8 mm	626 - 7A0	141 424
EEx ia IIC T6, electrically isolated	Height 30.8 mm	626 - 7B0	141 432

Please complete the Order Code 626-7.1. .... according to "Table 3: Specification and ordering information" for versions with user-specific input ranges.

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Programming

The SINEAX VK 626 is configured via a 4…20 mA two-wire lead using the HART protocol.

Programming is accomplished using either a hand-held terminal (Communicator) or a PC with a suitable interface and running the programming software.

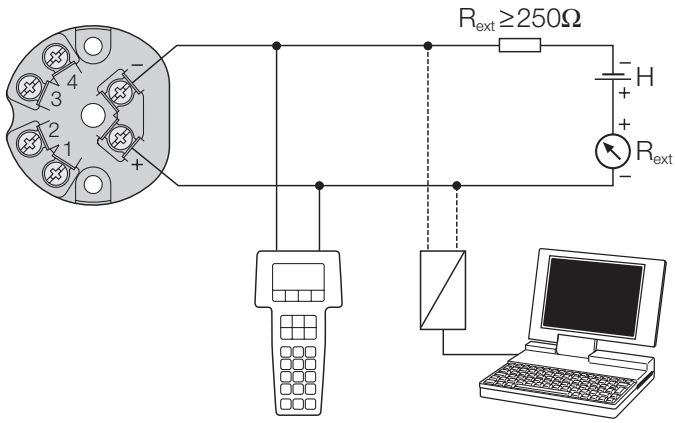


Fig. 2

Technical data

Measuring input

Temperature with resistance thermometers

Measuring range limits:	See table 4
Resistance types:	Type Pt 100 (IEC 60 751) Type Ni 100 (DIN 43 760)
Measuring current:	≤ 0.20 mA
Standard circuit:	1 resistance thermometer for **two-, three-** or **four-**wire connection
Input resistance:	R_i > 10 MΩ
Lead resistance:	≤ 30 Ω per lead

Temperature with thermocouple

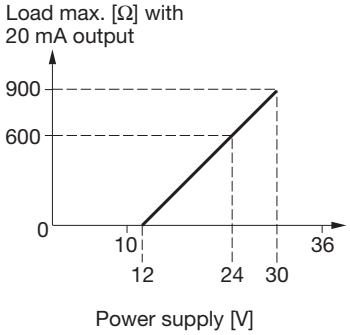
Measuring range limits:	See table 4
Thermocouple pairs:	Type B: Pt30Rh-Pt6Rh (IEC 584) Type E: NiCr-CuNi (IEC 584) Type J: Fe-CuNi (IEC 584) Type K: NiCr-Ni (IEC 584) Type L: Fe-CuNi (DIN 43710) Type N: NiCrSi-NiSi (IEC 584) Type R: Pt13Rh-Pt (IEC 584) Type S: Pt10Rh-Pt (IEC 584) Type T: Cu-CuNi (IEC 584) Type U: Cu-CuNi (DIN 43710) Typ W5 Re/W26 Re (ASTM Typ W3 Re/W25 Re E 988-90)
Standard circuit:	1 thermocouple, internal cold junction compensation or 1 thermocouple, external cold junction compensation
Input resistance:	Ri > 10 MΩ

Cold junction compensation: Internal or external

Internal:	Incorporated Pt 100
Permissible variation of the internal cold junction compensation:	± 0.5 K to 23 °C, ± 0.25 K/10 K
External:	0 … 60 °C, programmable

Measuring output (output/powering circuit)

Output signal I_A:	Impressed DC current, **linear with temperature**
Standard range:	4...20 mA, 2-wire technique
External resistance (load):	R_{ext} max. [kΩ] = (Power supply [V] – 12 V) / (max. output current [mA])



Residual ripple in output current:	< 1% p.p.

Accuracy data

Reference value:	Measuring range end value
Basic accuracy:	Max. error ≤ ± 0.2%
Linearity:	< 0.1%

Reference conditions

Ambient temperature	23 °C, ± 1 K
Power supply	18 V
Output burden	R_{ext} = 0 Ω

Influencing factors

Temperature:	< ± 0.15% / 10 K

Additional errors

Span < 5 mV	± 0.2%
End value/span > 10	± 0.2%

Open and short-circuit sensor circuit supervision

Signalling modes: Output signal programmable to …
- … the value the output had immediately prior to the open or short-circuit (Hold value)
- … a value between 4 and 21.6 mA

Power supply

DC voltage: Supply
12...30 V DC
max. residual ripple 1% p.p.
(supply must not fall below 12 V)
Protected against wrong polarity

Installation data

Dimensions: See section “Dimensional drawings”

Housing: Lexan 940 (Polycarbonate)
Flammability class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen

Mounting position: Any

Electrical connections: Screw terminals with Philips heads for max. 2 × 1.5 mm²

Weight: Approx. 60 g

Mounting: In terminal head by two M4 cheese-headed screws and two springs

Standards

Electromagnetic compatibility: The standards DIN EN 50 081-2 and DIN EN 50 082-2 are observed

Intrinsically safe: Acc. to DIN EN 50 020: 1996-04

Protection (acc. to IEC 529 resp. EN 60 529): Housing IP 40
Terminals IP 00

Electrical standards: Acc. to IEC 1010 resp. EN 61 010

Test voltage: 1500 V,
applied between measuring input and output

Ambient conditions

Climatic rating: Climate class 3Z acc. to VDI/VDE 3540

Commissioning temperature: – 10 to + 80 °C

Operating temperature: NEx – 25 to + 80 °C
Ex – 25 to + 55 °C/T6
– 25 to + 80 °C/T4

Storage temperature: – 40 to + 80 °C

Annual mean relative humidity: ≤ 75%

Table 2: Data on explosion protection ⟨Ex⟩ II 2 (1) G

Order Code	Type of protection Marking	Electrical data acc. to Certificate Sensor input	Output	Certificate	Mounting location of instrument
626 - 7B	EEx ia IIC T6	U_o = 6 V I_o = 16 mA P_o = 40 mW C_o = 40 µF L_o = 140 mH	U_i = 30 V I_i = 160 mA P_i = max. 1 W* $C_i \approx 0$ $L_i \approx 0$	EC-type-examination Certificate Zelm 99 ATEX	**Within** the hazardous area, zone 1 and 2**

** Ambient temperature Ex: – 25 °C … max. 60 °C (dependent on P_i)*
*** It is permissible for the sensor circuit to enter Zone 0, however, EN 50 284 and any applicable national standards must be observed.*

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

Order Code **626 -**			
Features, Selection	*SCODE	no-go	
1. Housing (power supply via output leads)			
7) For installation in a terminal head DIN 43 729, shape B			7 . . . . .
2. Version			
A) Not intrinsically safe			. A . . . . .
B) EEx ia IIC T6, intrinsically safe electrical circuits			. B . . . . .
3. Configuration			
0) **Basic** configuration programmed	G		. . 0 . . . . .
1) Programmed to order			. . 1 . . . . .
4. Measuring unit			
0) Basic configuration			. . . 0 . . . .
1) Temperatures in °C		G	. . . 1 . . . .
2) Temperatures in °F		G	. . . 2 . . . .
3) Temperaturs in K		G	. . . 3 . . . .
5. Measuring mode, input connection			
0) Basic configuration			. . . . 0 . . .
Thermocouple			
1) Internal cold junction compensation		G	. . . . 1 . . .
2) External cold junction compensation t_K		G	. . . . 2 . . .
Resistance thermometer			
3) Two-wire connection, R_L [Ω]		G	. . . . 3 . . .
4) Three-wire connection, $R_L \leq 30$ Ω/wire		G	. . . . 4 . . .
5) Four-wire connection, $R_L \leq 30$ Ω/wire		G	. . . . 5 . . .
Line 2: Specify external cold junction temperature t_K (in °C, °F or K, acc. to specification in Feature 4), any value between 0 and 60 °C or equivalent			
Line 3: Specify total lead resistance R_L [Ω], any value between 0 and 60 Ω			

Table 3: “Specification and ordering information” continued on next page!

Order Code **626 -**

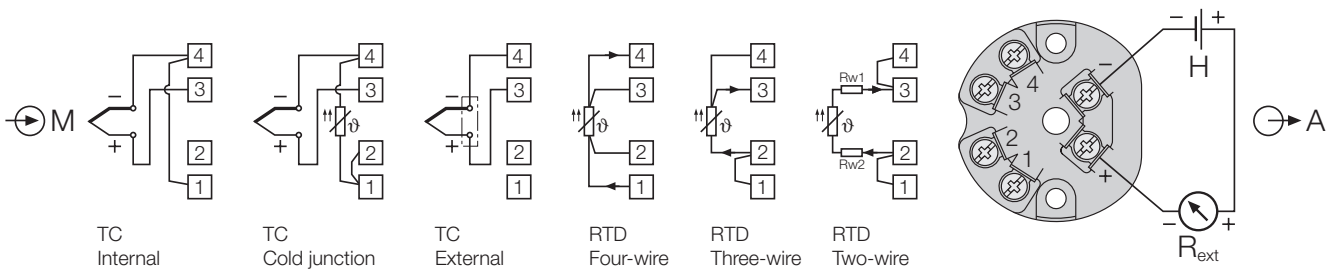
Features, Selection			*SCODE	no-go	
6. Sensor type / measuring range					
Sensor type / beginning … end value of measuring range					
0) Basic configuration					0 . . . . .
1) RTD Pt 100	Range			G	1 . . . . .
2) RTD Ni 100	Range			G	2 . . . . .
3) RTD Pt 100 … [Ω]	Range			G	3 . . . . .
4) RTD Ni 100 … [Ω]	Range			G	4 . . . . .
B) TC Typ B	Range			G	B . . . . .
E) TC Typ E	Range			G	E . . . . .
J) TC Typ J	Range			G	J . . . . .
K) TC Typ K	Range			G	K . . . . .
L) TC Typ L	Range			G	L . . . . .
N) TC Typ N	Range			G	N . . . . .
R) TC Typ R	Range			G	R . . . . .
S) TC Typ S	Range			G	S . . . . .
T) TC Typ T	Range			G	T . . . . .
U) TC Typ U	Range			G	U . . . . .
W) TC W5-W26Re	Range			G	W . . . . .
X) TC W3-W25Re	Range			G	X . . . . .
Specify measuring range in [°C], [°F] or [K]; refer to table 4 for the operating limits for each type of sensor. Lines 3 and 4: Specify resistance in Ω at 0 °C					
7. Output characteristic					
0) Standard 4 … 20 mA					. 0 . . . . .
1) Inversely 20 … 4 mA				G	. 1 . . . . .
8. Open-circuit supervision					
Output response for an open-circuit sensor					
0) Output 21.6 mA					. . 0 . . . .
1) Output	[mA]			G	. . 1 . . . .
2) Hold output at last value				G	. . 2 . . . .
A) No signal				G	. . A . . . .
Line 1: Any value between 4 and < 21.6 mA					
9. Output time response					
0) Standard setting time, approx. 1.5 s					. . . 0 . . .
9) Rise-time	[s]			G	. . . 9 . . .
Line 9: 1, 2, 4, 8 or 16 s					
10. Mains ripple suppression					
0) Frequency 50 Hz					. . . . 0 . .
1) Frequency 60 Hz				G	. . . . 1 . .
11. Test certificate					
0) Without test certificate					. . . . . 0 .
D) Test certificate in German				G	. . . . . D .
E) Test certificate in English				G	. . . . . E .

Lines with letter{s} under "no-go" cannot be combined with preceding lines having the same letter under "SCODE".

Table 4: Temperature measuring ranges

Measuring ranges [°C]	Resistance thermometer		Thermocouples									
	Pt100	Ni100	B	E	J	K	L	N	R	S	T	U
0... 20												
0... 25												
0... 40				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
	Span min. 50 K max. 850 K	Span min. 50 K max. 250 K	ΔU min 2 mV, max. 80 mV									

Electrical connections



M = Measuring input

A = Two-wire measuring output (measuring circuit)
(4 … 20 mA signal)
Power supply H = 12 … 30 V DC

Table 5: Accessories

Description	**Order No.**
Operating Instructions VK 626 Bd in German	141 961
Operating Instructions VK 626 Bf in French	142 084
Operating Instructions VK 626 Be in English	142 133

Standard accessories

1 Operating Instructions in German, French and English
1 Type examination certificate (only for “intrinsically safe” explosion-proof devices)

Dimensional drawing

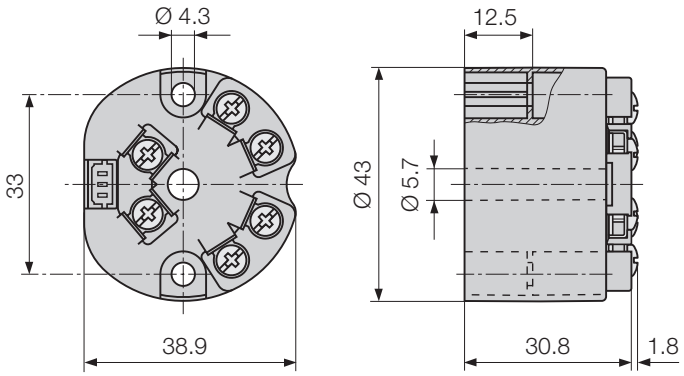


Fig. 3. SINEAX VK 626.

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