

Safety precautions to be strictly observed are marked with following symbols in the Operating Instructions:



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# Operating Instructions

## Programmable Temperature Transmitter

### SINEAX VK 636



VK 636 Be 142 141 02.02



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## 1. Read first and then ...



The proper and safe operation of the device assumes that the Operating Instructions are **read** and the safety warnings given in the various Sections

- 6. Installation in the plant**
- 7. Electrical connections**
- 8. Parametering and configuring the transmitter**
- 9. Commissioning**

are **observed**.

The device should only be handled by appropriately trained personnel who are familiar with it and authorised to work in electrical installations.

## 2. Scope of supply (Fig. 1)

### Transmitter (1)

Order Code: Significance of the 2nd. and 3rd digits

636 - 7 x x	
↑ ↑	
C	Standard, not intrinsically safe
D	EEx ia IIC T6, intrinsically safe electrical circuits
0	Basic configuration programmed
1	Configured to order



Fig. 1



Fig. 3

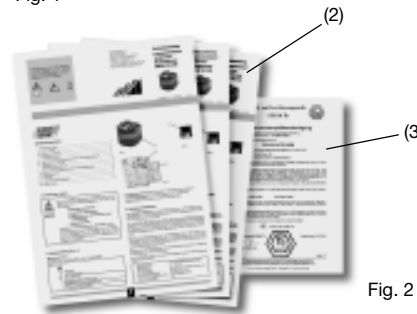


Fig. 2

- 1 CD card (4) with:**
- Data sheet
  - Operating instructions
  - EC type examination certification
  - Interface definition
  - Installation guideline
  - Profile PA 3.0
  - EDD and GSD files

## 3. Brief description

The **SINEAX VK 636** is a head-mounted transmitter with PROFIBUS PA® interface. It is designed for installation in the terminal head of a temperature sensor DIN 43 729, shape B extra high.

It is used for measuring temperature in conjunction with a thermocouple or resistance thermometer. Thermocouple non-linearities are automatically compensated. The output signal is digital according to specification IEC 61 158-2.

The communication protocol used is PROFIBUS-PA Profil Version 3.0. The measured variables, ranges and other parameters can be configured and set on a PC (Master Class 2) running the respective configuration software.

Explosion-proof "intrinsically safe" EEx ia IIC T6 versions rounds off the series of transmitters.

Transmitters supplied as standard versions are configured as follows:

- Measuring input:	Pt 100 for <b>three-wire</b> connection
- Measuring range:	0 ... 600 °C
- Mains ripple suppression:	For frequency 50 Hz
- Address:	126

## 4. Technical data

**Measuring input** terminals 1 to 4

Input variable and measuring range configured

Input variables	Measuring ranges		
	Limits	Min. span	Max. span
Temperatures with resistance thermometers for <b>two, three</b> or <b>four-wire</b> 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			

### Cold junction compensation

Internal: Incorporated Pt 100 or with Pt 100 connected to the terminals

External: Via cold junction thermostat 0...60 °C, configurable

**Measuring output** Terminals + / -

Communication protocol: Profibus PA (Profibus for Process Control, Version 3.0)

Transmission: Acc. to IEC 61 158-2

Bus termination: External

Transmission speed: 31,25 kbit/s

Power supply: Via the usual bus couplers according to IEC 61 158-2. The explosion protection type "intrinsically safe" instruments ( $U_i = 17.5 \text{ V}$ ,  $I_i$ ,  $P_i = \text{any value}$ ,  $C_i \leq 5 \text{ nF}$ ,  $L_i \leq 10 \text{ }\mu\text{H}$ ) corresponds to the FISCO model. It is therefore suitable for connection to FISCO model bus couplers.

For other types of connection, as for the FISCO model, the data are:  $U_i = 24 \text{ V}$ ,  $I_i = 250 \text{ mA}$ ,  $P_i = 1.2 \text{ W}$ ,  $C_i \leq 1.15 \text{ nF}$ ,  $L_i \leq 3 \text{ }\mu\text{H}$ . These values may not be exceeded by the power supply connected.

More information on the FISCO model may be obtained from the PTB report W53 and other sources.

### Programming connector on the transmitter

Interface: Output terminals

### Open and short-circuit sensor circuit supervision

Signalling modes: Acc. to Profibus 3.0

## 5. Securing the terminal head of the temperature sensor

The **SINEAX VK 636** is suitable for mounting on an insert that is fitted into a temperature sensor with a shape B DIN extra high terminal head.

The length of the leads to the insert has to conform to the height of the terminal head (Fig. 5).

Thread the leads through the hole in the centre of the transmitter. Align the transmitter in the lower part of the terminal head and secure it using two cheese-headed screws (1) and two springs (2) (see Fig. 4). Connect the leads acc. to section "7. Electrical connections".

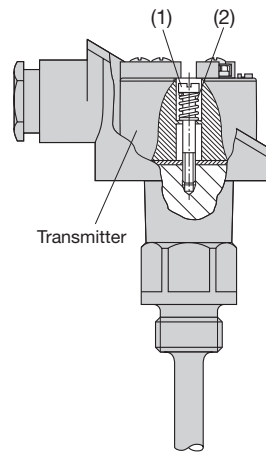


Fig. 4. Spring mounting on the insert in the terminal head.

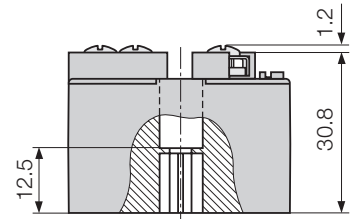


Fig. 5. SINEAX VK 636.

## 6. Installation in the plant

Mount the thermometer transmitter according to type (screwed, sliding terminal screws, flange etc.) at the prescribed location.



Make sure that the ambient temperature stays within the **permissible limits**:

Standard instruments: - 25 and + 80 °C

**Ex** version: - 25 to max. 45 °C, T6

- 25 to max. 60 °C, T5

- 25 to max. 80 °C, T4

## 7. Electrical connections

The leads are connected to the 6 Philips head screw terminals on the front of the transmitter. The maximum wire gauge is  $2 \times 1.5 \text{ mm}^2$ , see Fig. 6. The applicable enclosure Protection Class for the terminals is IP 00 according to EN 60 529.

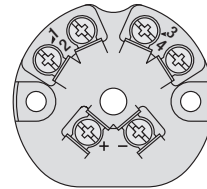


Fig. 6



Also note that, ...

... the data required to carry out the prescribed measurement must correspond to those marked on the nameplate of SINEAX VK 636 (sensor, range, output) (see Fig. 8)!

In all other respects, observe all local regulations when selecting the type of electrical cable and installing them!



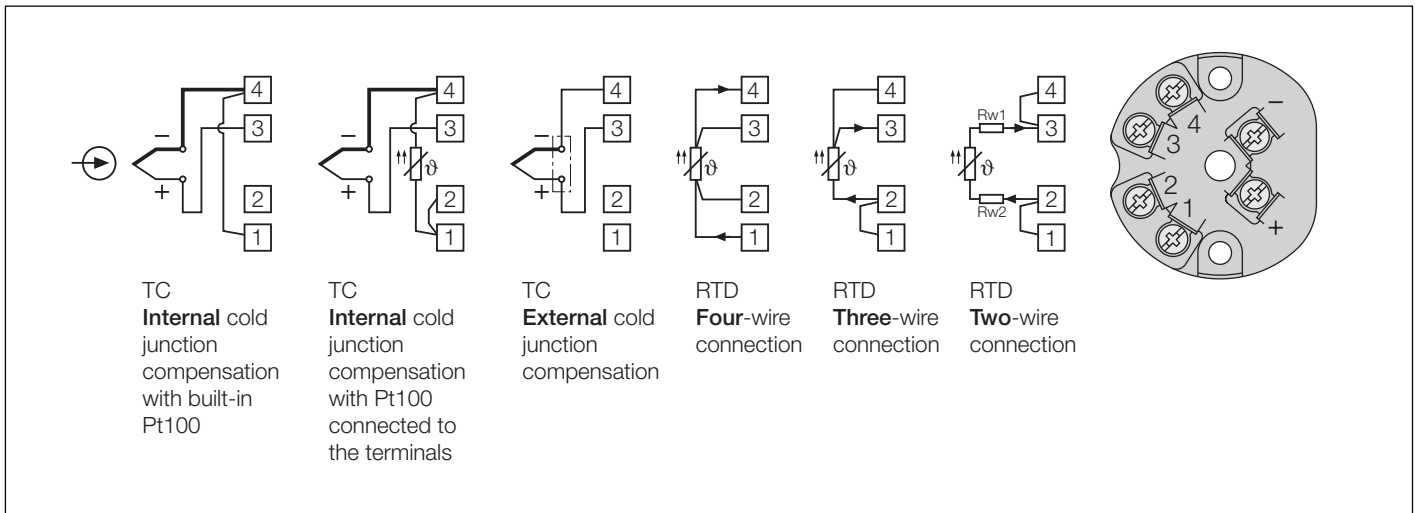
In the case of "Intrinsically safe" explosion-proof, the supplementary information given on the type examination certification, the EN 60 079-14, and also local regulations applicable to electrical installation in explosion hazard areas must be taken into account!

The power supply from the coupler must not exceed the maximum values given in the SINEAX VK 636 EC type examination certificate.

## 7.1 Alternative measurement connections

Connect the measuring leads to suit the application as given in Table 1.

Table 1: Measuring input



Notes:

### 7.1.1 Connection to thermocouples

Pay attention to correct polarity when connecting thermocouples. If the lead from the thermocouple to the transmitter has to be extended, be sure to use thermally compensated leads suitable for the particular type of thermocouple.

#### 7.1.1.1 Internal cold junction compensation with incorporated Pt100

Connect terminals ① and ④ when using internal compensation by comparison.

Set the configuration software to “internal thermo-element” and “Pt 100 built-in”.

#### 7.1.1.2 Internal cold junction compensation with Pt 100 connected to the terminals

For this alternative, a Pt 100 is connected to terminals ① and ④. Terminals ① and ② must be connected.

Set the configuration software to “internal thermo-element” and “Pt 100 on terminals”.

#### 7.1.1.3 External cold junction compensation

When using a cold junction thermostat, please observe that the correct reference temperature is configured. The connection between the cold junction thermostat and the transmitter is made with copper wires.

### 7.1.2 Connection to resistance thermometers

#### 7.1.2.1 Two-wire connection

Terminals ① and ② and ③ and ④ must be connected in the case of a two-wire measurement.

The lead resistance must not be greater than 30 Ω per lead.

#### 7.1.2.2 Three-wire connection

Terminals ① and ② must be connected in the case of a three-wire measurement. It is not necessary to compensate the leads, providing the three leads have identical resistances. The lead resistance must not be greater than 30 Ω per lead.

#### 7.1.2.3 Four-wire connection

The four-wire measurement is independent of lead resistance within wide limits and therefore no compensation is necessary. The lead resistance must not be greater than 30 Ω per lead.

### 7.2 Connecting the bus cable

Connect the power supply wires to the terminals “+” and “-”. (The device is protected against reverse polarity.)

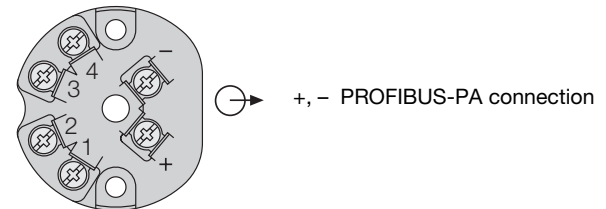


Fig. 7

When installing the bus cable please observe...

- ... that a screened 2-wire cable must be used,
- ... that only a recommended cable type must be used,
- ... that the bus cable must be separately installed from other cables > 60 V,
- ... that the cable must not be installed near large electrical equipment.

<b>VK 636</b>	Sensor Pt 100, 3-wire	CE	Camille Bauer AG Aargauerstr. 7 CH-5610 Wohlen Switzerland
Type 636-7D0	Range 0...600°C		
Ord: 141945 / 1419450	Interface IEC 61158-2 Profibus PA		

Fig. 8. Example of a nameplate for an instrument in standard version.

## 8. Setting and configuring the transmitter

The measured variables, ranges and other parameters can be configured and set on a PC (Master Class 2) running the respective configuration software. The hardware required includes an DP cable, a bus coupler and an ancillary two-wire cable.

The connections between “Master Class 2 ↔ bus coupler ↔ SINEAX VK 636” can be seen from Fig. 9.

The bus coupler compensates the level between RS 485 and IEC 61 158-2 and also establishes the power supply connection between the Master Class 2 and the SINEAX VK 636 transmitter.

## Safe area

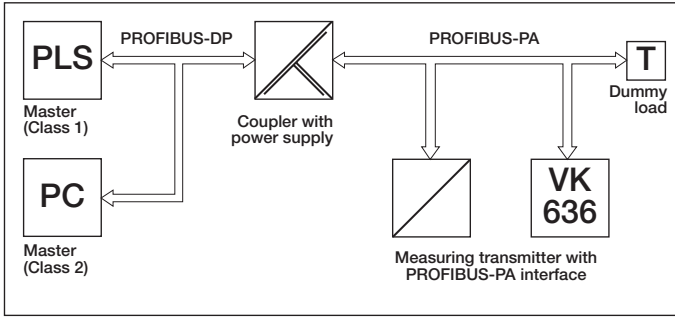


Fig. 9. Communication by PROFIBUS-PA interface.

## 9. Commissioning



Switch on the measuring input and the power supply. The ambient temperature must be between  $-10$  to  $+80$  °C for standard instruments. For Ex devices observe the information given in the type examination certificate.

## 10. Maintenance

No maintenance is required.

## 11. Accessories and spare parts

Description	Order No.
<b>Operating Instructions VK 636 Bd</b> in German	141 979
<b>Operating Instructions VK 636 Bf</b> in French	142 092
<b>Operating Instructions VK 636 Be</b> in English	142 141

## 12. Dimensional drawings

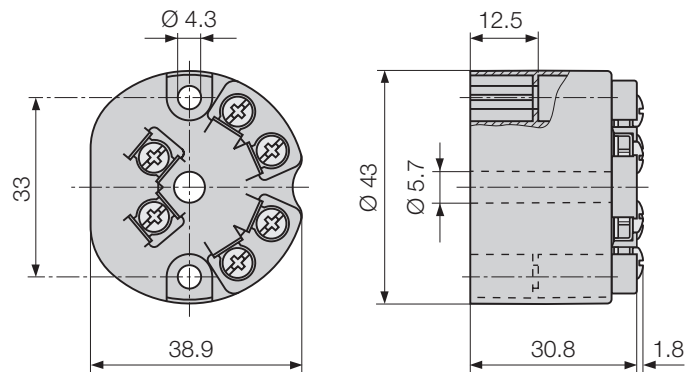


Fig. 10. SINEAX VK 636.