

1. Safety instructions

1.1 Symbols

The symbols in these instructions point out risks and have the following meaning:



Smooth and safe operation requires that these operating instructions be read and understood!
 Warning in case of risks.
 Non-observance can result in malfunctioning.



Non-observance can result in malfunctioning and personal injury.



Information on proper product handling.

1.2 Intended use

- The purpose of the SINEAX TVD825 isolating amplifier is to galvanically isolate input signals from output signals, to amplify them and/or transform them to another level or another signal type (current or voltage).
- The device is intended for installation in industrial plants and meets the requirements of EN 61010-1.
- Manufacturer is not liable for any damage caused by inappropriate handling, modification or any application not according to the intended purpose.

1.3 Commissioning



- Installation, assembly, setup and commissioning of the device has to be carried out exclusively by skilled workers.
- Observe manufacturer's operating instructions. Do not operate the device outside of the limit values stated in the operating instructions. Check all electric connections prior to commissioning the plant.
- Safety measures should be taken to avoid any danger to persons, any damage of the plant and any damage of the equipment due to breakdown or malfunctioning of the device.
- Decommission the device if its safe operation is no longer possible (e.g. in case of visible damages). Disconnect all connections. Send the device to our plant or to one of our authorised service centres.

1.4 Repair work and modifications



Repair work and modifications shall exclusively be carried out by the manufacturer. In case of any tampering with the device, the guaranty and warranty claim shall lapse. We reserve the right of changing the product to improve it.

1.5 Disposal



The disposal of devices and components may only be realised in accordance with good professional practice observing the country-specific regulations (applicable within the European Union and other European countries with a separate collection system).

1.6 Transport and storage



Transport and store the devices exclusively in their original packaging. Do not drop devices or expose them to substantial shocks.

2. Scope of delivery

- 1 Isolating amplifier SINEAX TVD825
- 1 Operating instructions in German, French and English

3. General features

- Input of voltage, current, temperature (RTD, TC) or resistance
- Power supply of the sensor for current input (max. 17 V DC)
- Measurement on galvanically isolated output for voltage and active/passive current.
- Selection of input and output type, START/END for the selected input and output type by means of DIP switches.
- Indication of available power supply and of alarm state via LED.
- Galvanic 4-way isolation (supply/ input / output 1 / output 2): 1500 V AC.

4. Technical data

4.1 General data

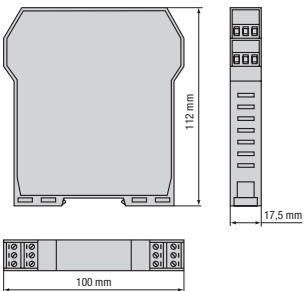
Power supply	10...40 V DC, 19...28 V AC, 50...60 Hz, max. 2,0 W; min. 0,5 W
Input	1 isolated independently parameterisable input for: Current (input impedance 50 Ω): 0...20 mA via passive or active connection (loop supply max. 25 mA at max. 17 V) Voltage (input impedance 120 kΩ): 0...10 V Potentiometer (input impedance > 5 MΩ): 1...100 kΩ (excitation current 1 mA) Thermocouple (input impedance > 5 MΩ): Type B,E,J,K,N,R,S,T Thermo resistor: Type PT100, PT500, PT1000, NI100 (Excitation current: 1.1 mA (PT100) and 0.11 mA (PT500, PT1000))
Input resolution	14 Bit
Sample rate	Configurable: 16.66 ms (at 60 Hz) or 20 ms (at 50 Hz)
Response time	Sample rate + 6 ms
Outputs	2 isolated, independently parameterisable outputs for : Current (maximum load 600 Ω): 0...20 mA via passive or active connection Voltage (minimum load 20 kΩ): 0...10 V
Output resolution	14 Bit

4.2 Accuracy data

Error in relation to maximum measuring range	Basic accuracy (at reference)	Temperature influence	Linearisation error	EMI
Voltage/current input	0.1 %	0.01 % / °K	0.05 %	<1 % (1)
Input potentiometer	0.1 %	0.01 % / °K	0.1 %	<1 %
Input TC: E, J, K, N, T	0.1 %	0.01 % / °K	0.2 °C	<1 % (1)
Input TC: R, S	0.1 %	0.01 % / °K	0.5 °C	<1 % (1)
Input TC: B (2)	0.1 %	0.01 % / °K	1.5 °C	<1 % (1)
Input RTD (3)	0.1 %	0.01 % / °K	0.02 % (f f > 0 °C) 0.05 % (f f < 0 °C)	<1 % (4)
Voltage / current output (5)	0.1 %	0.01 % / °K	0.01 %	<1 %
Reference conditions	Ambient temperature		25 °C	
	Power supply		24 V	

- Resistance influence of conductors 0.1 µV / Ω
- Output zero for t < 250 °C
- Type RTD: PT100, PT500, PT1000, NI100. All errors to be calculated for resistance value.
- Resistance influence of conductors 0.005 % / Ω, max. 20 Ω
- The values stated are to be added to the error of the input selected.


4.3 Installation data

Design	Top-hat rail housing
Material	PBT (black)
Connections	Screw terminals 0.2...2.5 mm ²
Housing ingress protection	IP20
Weight	200 g
Dimensions	

4.4 Environmental conditions

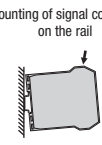
Operating temperature	-10...+65 °C
Storage temperature	-20...+85 °C
Humidity	30...90 % at 40 °C (non-condensing)
Degree of pollution	2
Area of application	Indoor areas up to 2000 m above sea level

4.5 Regulations

The device complies with the following standards:	EN 61000-4-5 Class 2 (Surge protection of inputs, outputs/ power supplies)
	EN 61000-6-4/2002 EN 61000-6-4/2002 (Electromagnetic interference, industrial environments)
	EN 61000-6-2/2005 (Electromagnetic compatibility, industrial environments)
	EN 61010-1/2001 (Safety)
	All circuits have to be insulated with double insulation against circuits carrying hazardous voltage. The power supply transformer has to comply with the specifications of EN 60742: Isolating and safety transformers

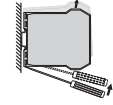
5. Mounting instructions

The signal converter is designed to be mounted on rails according to DIN 46277.



Mounting of signal converter on the rail

- Place the signal converter onto the top part of the rail.
- Press the signal converter downwards.



Removing the signal converter from the rail

- Use a screwdriver (as shown in the figure) as a lever.
- Turn the signal converter downwards.



For optimum function and longevity, ensure adequate ventilation of the signal. We recommend installation in vertical position. Avoid installing the signal converter above devices generating heat. We recommend installing it at the bottom of the switch cabinet.

6. Installation instructions

6.1 Input selection

The input type is selected by setting the DIP switch group SW1 1 to 5. Select the start of scale for the measuring input using DIP switches 6, 7 and 8 of switch group SW1. Select the end of scale for the measuring input using DIP switches 6, 7 and 8 of switch group SW2.



Note for all tables:
 The symbol ● indicates that the DIP switch is in ON position.
 No entry means the DIP switch is in OFF position!

SW1: INPUT TYPES

1	2	3	4	5	6	7	8	Type
				●				Voltage input
			●					Current input
				●	●			Input of potentiometer (POT)
	●							Input of thermocouple B (TC B)
		●						Input of thermocouple J (TC E)
			●					Input of thermocouple K (TC K)
	●		●					Input of thermocouple N (TC N)
				●	●			Input of thermocouple R (TC R)
					●	●		Input of thermocouple S (TC S)
	●							Input of thermocouple T (TC T)

1	2	3	4	5	6	7	8	Type
	●	●						Input of thermo resistor (RTD) PT100 (2 conductors)
	●	●	●					Input of thermo resistor (RTD) PT100 (3 conductors)
	●	●	●	●				Input of thermo resistor (RTD) PT100 (4 conductors)
●								Input of thermo resistor (RTD) NI100 (2 conductors)
●								Input of thermo resistor (RTD) NI100 (3 conductors)
●					●			Input of thermo resistor (RTD) NI100 (4 conductors)
●						●		Input of thermo resistor (RTD) PT500 (2 conductors)
●						●	●	Input of thermo resistor (RTD) PT500 (3 conductors)
●						●		Input of thermo resistor (RTD) PT500 (4 conductors)
●						●	●	Input of thermo resistor (RTD) PT1000 (2 conductors)
●						●	●	Input of thermo resistor (RTD) PT1000 (3 conductors)
●						●	●	Input of thermo resistor (RTD) PT1000 (4 conductors)

SW1: Scale START for type selected

The table below lists the possible START and END values according to the input type selected.

6	7	8	Voltage	Current	POT	TC B (°)	TC E	TC J	TC K	TC N
		●	0 V	0 mA	0%	0 °C	-200 °C	-200 °C	-200 °C	-200 °C
	●		0.5 V	1 mA	10%	500 °C	-100 °C	-100 °C	-100 °C	-100 °C
	●	●	1 V	2 mA	20%	600 °C	0 °C	0 °C	0 °C	0 °C
●			2 V	3 mA	30%	700 °C	100 °C	100 °C	100 °C	100 °C
●	●		4 V	4 mA	40%	800 °C	150 °C	200 °C	200 °C	200 °C
●	●	●	5 V	5 mA	50%	1000 °C	200 °C	300 °C	300 °C	300 °C
●	●	●	10 V	10 mA	60%	1200 °C	400 °C	500 °C	500 °C	500 °C

6	7	8	TC R	TC S	TC T	PT100	NI100	PT500	PT1000
		●	0 °C	0 °C	-200 °C	-200 °C	-50 °C	-200 °C	-200 °C
	●		100 °C	100 °C	-100 °C	-100 °C	-30 °C	-100 °C	-100 °C
	●	●	200 °C	200 °C	-50 °C	-50 °C	-20 °C	-50 °C	-50 °C
●			300 °C	300 °C	0 °C	0 °C	0 °C	0 °C	0 °C
●	●		400 °C	400 °C	150 °C	50 °C	20 °C	50 °C	50 °C
●	●	●	600 °C	600 °C	100 °C	100 °C	30 °C	100 °C	100 °C
●	●	●	800 °C	800 °C	150 °C	200 °C	50 °C	200 °C	200 °C

6.2 Output selection

The output type is selected by setting the DIP switch group SW2 1 to 5.



Note: Set the DIP switches while module is powered down. This avoids electrostatic discharges which might damage the module.

SW2: OUTPUT TYPES

1	2	3	4	5	6	7	8	Type
								Output 1: Voltage 0...10 V
	●							Output 1: Voltage 0...5 V
●								Output 1: Current 0...20 mA
●	●							Output 1: Current 4...20 mA
								Output 2: Voltage 0...10 V
								Output 2: Voltage 0...5 V
			●					Output 2: Current 0...20 mA
			●	●				Output 2: Current 4...20 mA
								Current output active
							●	Current output passive

SW2: Scale END for type selected

6	7	8	Volt- age	Cur- rent	POT	TC B (*)	TC E	TC J	TC K	TC N
		●	0.5 V	1 mA	40%	500 °C	50 °C	100 °C	200 °C	200 °C
	●		1 V	2 mA	50%	600 °C	100 °C	200 °C	400 °C	400 °C
	●	●	2 V	3 mA	60%	800 °C	200 °C	300 °C	600 °C	600 °C
●			3 V	4 mA	70%	1000 °C	300 °C	400 °C	800 °C	800 °C
●	●		4 V	5 mA	80%	1200 °C	400 °C	500 °C	1000 °C	1000 °C
●	●		5 V	10 mA	90%	1500 °C	600 °C	800 °C	1200 °C	1200 °C
●	●	●	10 V	20 mA	100%	1800 °C	800 °C	1000 °C	1300 °C	1300 °C

6	7	8	TC R	TC S	TC T	PT100	Ni100	PT500	PT1000
		●	400 °C	400 °C	50 °C	50 °C	20 °C	0 °C	0 °C
	●		600 °C	600 °C	100 °C	100 °C	40 °C	50 °C	50 °C
	●	●	800 °C	800 °C	150 °C	200 °C	50 °C	100 °C	100 °C
●			1000 °C	1000 °C	200 °C	300 °C	80 °C	150 °C	150 °C
●	●		1200 °C	1200 °C	250 °C	400 °C	100 °C	200 °C	200 °C
●	●		1400 °C	1400 °C	300 °C	500 °C	150 °C	300 °C	300 °C
●	●	●	1750 °C	1750 °C	400 °C	600 °C	200 °C	400 °C	400 °C

6.3 LED indications on the front panel

LED	Status	Meaning
PWR	ON (green)	Indicates presence of power supply, appropriate supply
ERR	ON (yellow)	Alarm status present
	OFF	No alarm status

7. Electrical connections



Make sure to adhere to the data on the type plate.

The country-specific provisions (e.g. for Germany, VDE 0100 «Conditions for setting up high-voltage systems with nominal voltages below 1000 Volt») are to be observed during installation and material selection for electric lines.

In order to meet the immunity requirements, we advise using shielded cables to connect the signals. The shield has to be connected to primary grounding for instrumentation. Moreover, it is favourable not to route conductors near power appliances such as inverters, motors, induction ovens, etc.



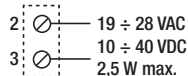
It is imperative to ensure that all lines are de-energised when connecting! High voltage may cause danger.

To connect electric lines, the signal converter has screw terminals suitable for wire cross sections up to a maximum of 2.5 mm². When connecting cables, please observe the following:

1. Remove approx. 0.8 cm of the cable insulation.
2. Insert the cable in the round opening.
3. Tighten the screw terminal firmly using a screwdriver.
4. Check if the cable is attached securely

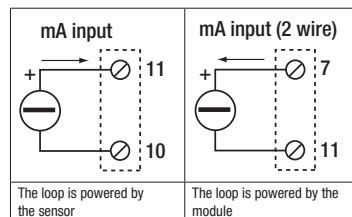
7.1 Power supply

Power supply has to range between 10 and 40 VDC (irrespective of polarity) or 19 and 28 VAC; see also the section «Installation instructions».

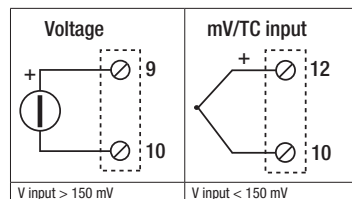


The upper limits must not be exceeded to avoid serious damage of the module. Protect the power supply source to avoid possible damage of the module by using a fuse of suitable size.

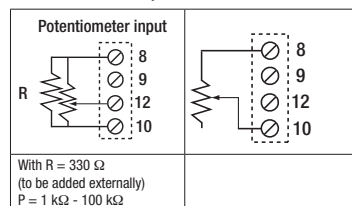
7.2 Current input



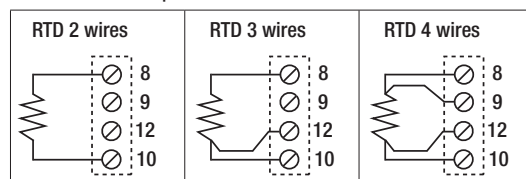
7.3 Voltage input



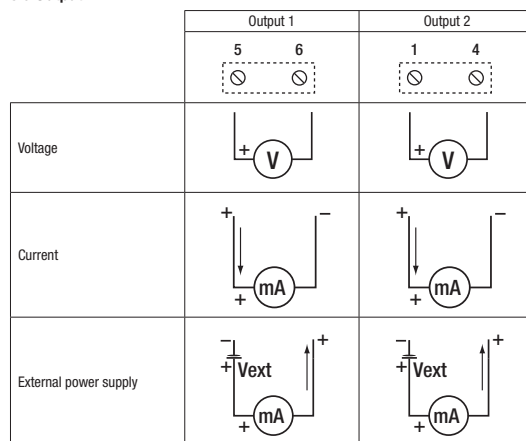
7.4 Potentiometer input



7.5 Thermo resistor input RTD



8.6 Output



8. Maintenance

The signal converter is maintenance-free. Any repair work may only be performed by authorised bodies. Any warranty claim will lapse in case of violation.

9. Terms of warranty

Camille Bauer AG warrants the flawless condition of the product with respect to material, manufacturing and function and offers a standard warranty of 36 months. Such warranty becomes effective upon delivery of the product to the customer. Camille Bauer AG reserves the right to amend the terms of warranty any time with future effect.

Any defects shall be communicated by the buyer immediately after discovery. The rejected products shall be sent in proper packaging and with sufficient transport protection to one of our authorised service centres. The sender shall bear the shipping risk.

Any defects arising due to improper treatment, faulty installation, mechanical damage, failure to perform maintenance work, inappropriate use and connection to improper power supply shall be excluded from any kind of warranty.

In case of repair work, alterations or tampering on the part of the buyer or any unauthorised third parties, any warranty claim shall lapse.

10. Order information

Description		Part No.
SINEAX TVD825	Voltage / current isolating amplifier and signal duplicator	172685

11. Declaration of conformity

EG / IEC KONFORMITÄTSERKLÄRUNG
EC / IEC DECLARATION OF CONFORMITY

Dokument-Nr. / Document.No.: **TVD825_CE-konf.DOC**

Hersteller / Manufacturer: **Camille Bauer Metrawatt AG**
Switzerland

Anschrift / Address: **Aargauerstrasse 7**
CH-5610 Wohlen

Produktbezeichnung / Product name: **Strom-/Spannungs-Trennverstärker/Signalverdoppler**
Voltage/Current signal converter / duplicator

Typ / Type: **SINEAX TVD825**

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein, nachgewiesen durch die Einhaltung folgender Normen:

The above mentioned product has been manufactured according to the regulations of the following European directives proven through compliance with the following standards:

Richtlinie / Directive	2004/108/EG(CE) Elektromagnetische Verträglichkeit - EMV-Richtlinie Electromagnetic compatibility - EMC directive
Norm / Standard	EN 61000-6-4: 2007 Fachgrundnormen - Störaussendung für Industriebetriebe Generic standards - Emission standard for industrial environments EN 61000-6-2: 2005 Fachgrundnormen - Störfestigkeit für Industriebereiche Generic standards - Immunity for industrial environments
Prüfungen / Tests	IEC 61000-4-5
Richtlinie / Directive	2006/95/EG(CE) Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen - Niederspannungsrichtlinie - CE-Kennzeichnung : 95 Electrical equipment for use within certain voltage limits - Low Voltage Directive - Attachment of CE marking : 95
Norm / Standard	EN 61010-1: 2001 Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 1: Allgemeine Anforderungen Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

Ort, Datum / Place, date: **Wohlen, 13. Mai 2014**

Unterschrift / signature:

M. Ulrich
 Leiter Technik / Head of engineering

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