CAMILLE BAUER

Rely on us.

PROCESS CONTROL ENGINEERING

Camille Bauer
Process Control Engineering at a glance

Who we are

Only the best have always been working for us, i.e. our customers and the market with all of its changing and new challenges. This implies a permanent learning aptitude which is consistently implemented in our products - particularly in customised solutions. And this world-wide, always considering local requirements, conditions and regulations.
We launch new products as announced. We adhere strictly to confirmed delivery dates.
And: Our responsibility in relation to customers does not end upon the conclusion of a sale.
Systematic and innovative thinking determines our actions. The concept of all product groups is comprehensive and integrative.
In this respect, high priority is given to the interaction of hardware and software.

Our offer/your order

Our program may be subdivided as follows:
- **Heavy current engineering**
- **Angular position engineering**
- **Process control engineering**

Camille Bauer offers two options for orders:
The versatile products of Camille Bauer have different product features. You can obtain products via Order Code or as stock versions.

The Order Code is stated on the data sheets on our homepage:

www.camillebauer.com.

Use the article numbers of the preferred variants listed in this catalogue for standard applications. These products can be delivered very promptly.

Rely on us.

It is a matter of course that our competent sales partners in your country will support you in ordering (please see the inside of the rear cover or visit our homepage).

Our in-house area sales manager will support you in countries which are not listed.

Rely on us:
We provide a
3-year warranty for all
Camille Bauer products.

CAMILLE BAUER

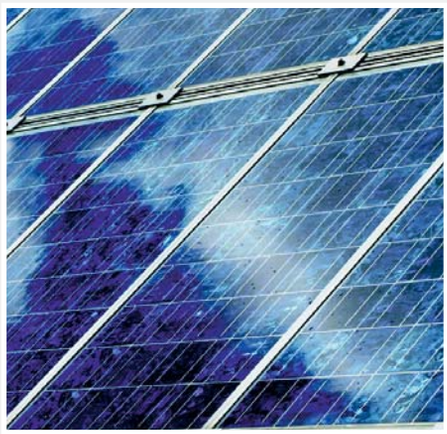
Rely on us.

PROCESS CONTROL ENGINEERING

For a smooth flow of information. And cost-effective processes.

The more complex a process is designed, the more important are precise instruments for its continuous progression: They assume and secure the flow of information within the system. Instruments of Camille Bauer are successfully used for these technological management tasks in numerous industries.

MEASURING TASKS IN PROCESS CONTROL ENGINEERING



TEMPERATURE

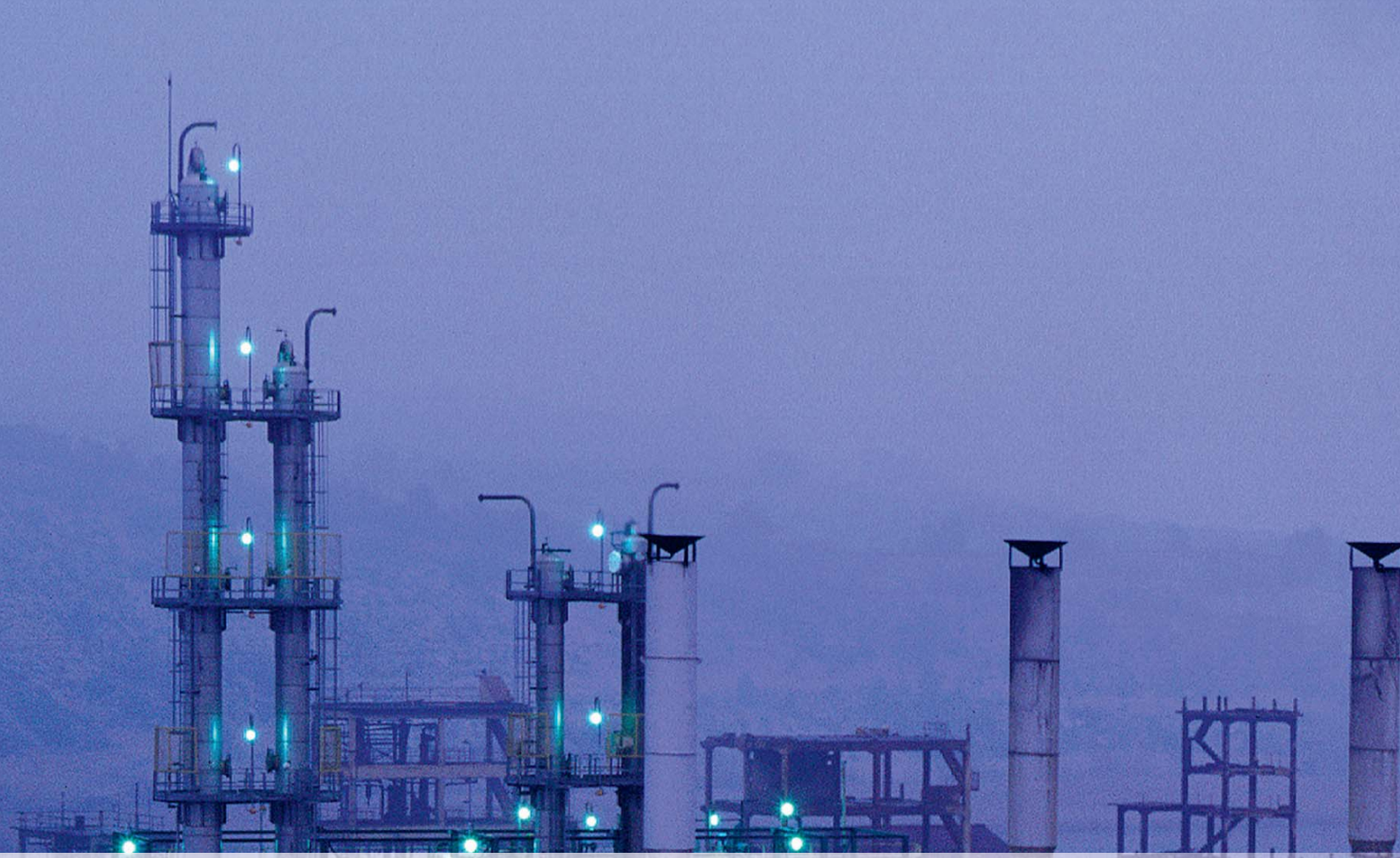
Temperature is the most frequently measured variable in process industry. Respective sensors are used in accordance with requirements, mostly thermocouples or resistance thermometers. For further processing, this sensor data is reliably converted by our signal converters into standard signal or to a fieldbus.

SIGNAL CONVERSION

The safety and availability of a process plant take first place in the considerations of plant operators. In order to transfer the signals in a safe manner and free of any disturbance they often have to be amplified, galvanically isolated between the individual circuits and possibly adapted to requirements. This effectively prevents potential transfer – people and plant are protected in an optimum fashion.

PROCESS MANAGEMENT

Process management systems assume the visualisation, recording and management of process data. These systems have intelligent control functions and form the interface of analogue signals as well as bus systems to the next higher-ranking control level.



PROCESS CONTROL ENGINEERING

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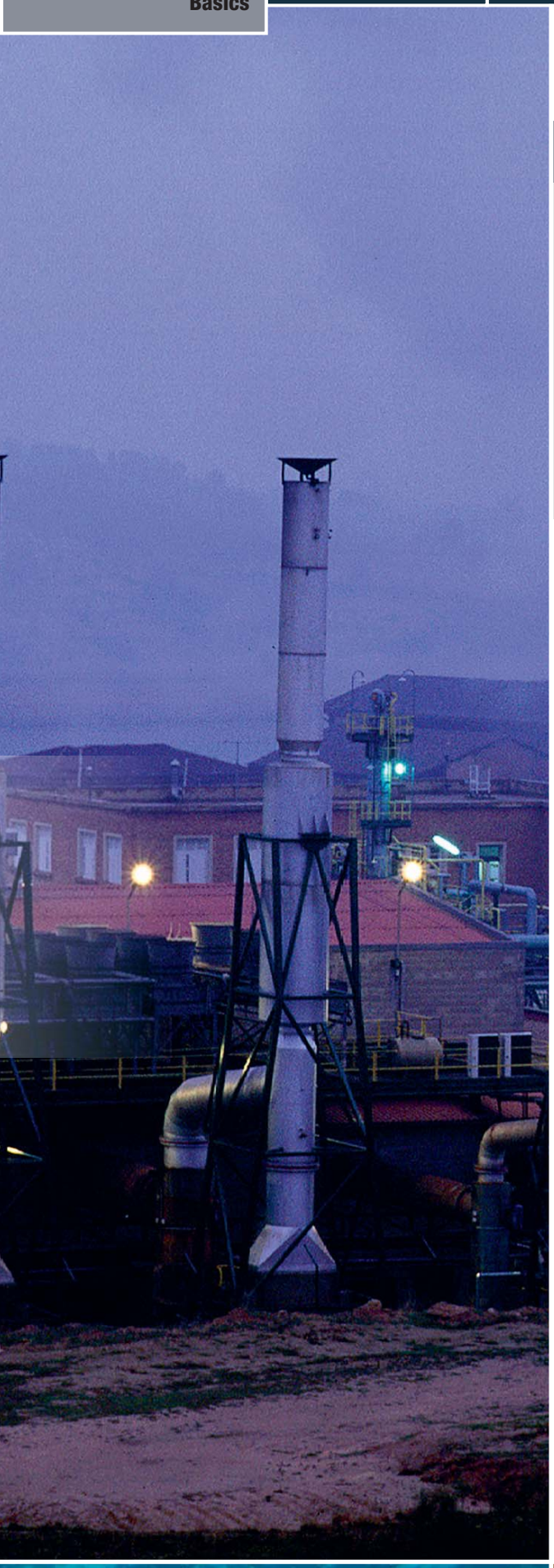


Content basics

Galvanic isolation

Despite the continually increasing level of automation and the proliferation of fieldbus systems in process automation, signal converters are still indispensible. They essentially perform 3 main tasks:
- Signal conversion
- Galvanic isolation of signals
- The amplification of signals

In addition, some signal converters can supply 2-wire transmitters.

Two distinct systems are available: Passive signal converters designed in the so-called 2-wire technology which obtain their energy directly from the measuring circuit and active signal converters, e.g. isolation amplifiers, which are equipped with a special power supply connection. Galvanic isolation of the individual "circuits" is of great significance. Camille Bauer signal converters typically feature galvanic 3-way isolation which completely decouples the input, output and power supply circuit.

Galvanic isolation

Galvanic isolation (also referred to as decoupling) generally describes the electric isolation of two power circuits. Charge carriers cannot flow from one circuit to another since there is no conductive connection between the circuits. However, electric power or signals may be transmitted between the circuits via corresponding coupling elements.
A typical example for galvanic isolation is a simple transformer with a primary and secondary winding. Both windings are completely separated from each other. The energy is transmitted by electromagnetic fields. Apart from this process for galvanic isolation, Camille Bauer also uses optical paths. The signal is transmitted by light pulses from a transmitter to a receiver.

Signal converters with power supply

(Active signal converters / 4-wire technology)
These signal converters are equipped with a power supply which is galvanically isolated from the measuring circuit. Depending on the design, these signal converters are frequently not only used as potential isolators but also as signal converters or amplifiers. See Figure 1.

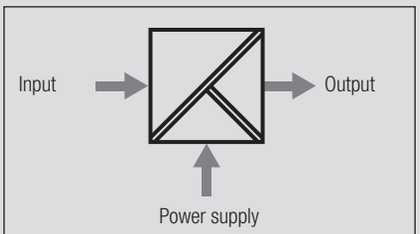


Figure 1

Signal converters without power supply

(passive signal converters / 2-wire technology
Potential isolation or measuring signal conversion does not always demand active signal converters – signal converters without power supply can be employed frequently without any limitation. In this case, the energy is supplied from the voltage drop at the input terminals of the passive signal converter. However, the appropriateness for the respective application is to be examined taking the power rating of the input signal and the output burden into consideration. Signal converters without power supply do not enable signal amplification and do not work free of reaction, i.e. the output burden bears directly on the input signal.
For an example see Figure 2: A transmitter with a 0…20 mA signal at the input of a passive signal converter can carry a maximum of 18 V (I_E = 0…20 mA, $U_{E\,max}$ = 18 V).
The voltage drop or internal voltage consumption U_{Int} of the signal converter is stated to be 2.8 V. This results in $U_E = U_{Int} + (I_A \times R_B)$ the maximum output: $R_{B\,max} = (U_{E\,max} - U_{Int}) / 20\ mA = 760\ \Omega$.

Main tasks of signal converters

Signal conversion

An input signal is converted into an output signal. Numerous applications require this feature. For example, resistance or voltage values of temperature sensors are converted into standardised current signals, e.g. 4…20 mA or 0…20 mA. Adaptations from 4…20 mA to 0…20 mA or to voltage signals are also quite common. In addition, input curves often have to be adapted, linearised or inverted. (Figure 3).

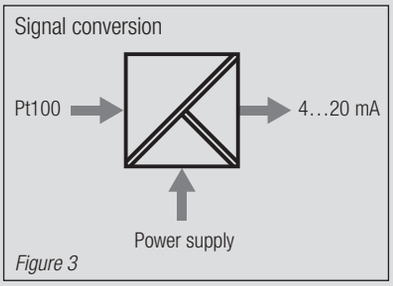


Figure 3

Galvanic isolation of signals

Input and output signals are galvanically isolated from each other. This avoids parasitic voltages by potential differences, ensures plant safety and protects persons. Galvanic isolation thus safeguards personal security when voltages with

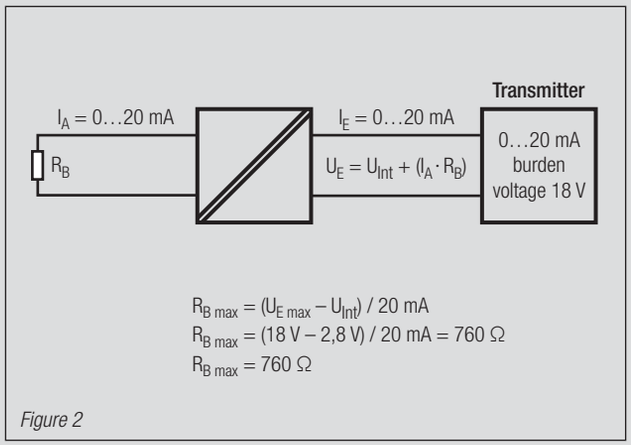


Figure 2

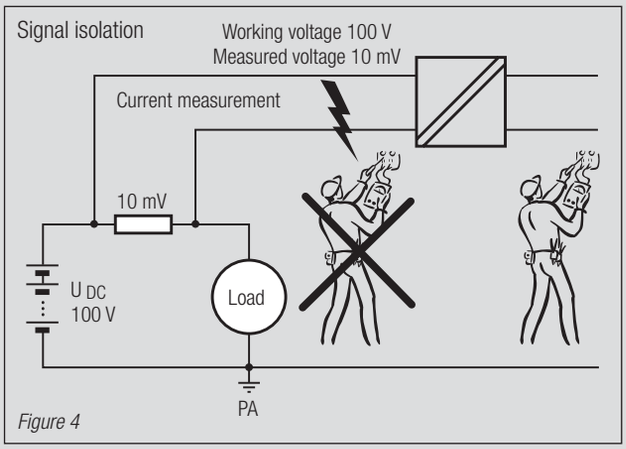


Figure 4

dangerously high potentials are measured. Despite the fact that a measuring signal may only amount to a few mV, the potential against earth and thus against persons is dangerously high in case of a failure. This is referred to as the working voltage. Figure 4 shows the example of 10 mV measurement on a working voltage of 100 V.

Signal amplification
This function is reserved for active signal converters since a separate power supply is needed. It mainly concerns applications requiring bridging of long signal paths and the avoidance of interferences.

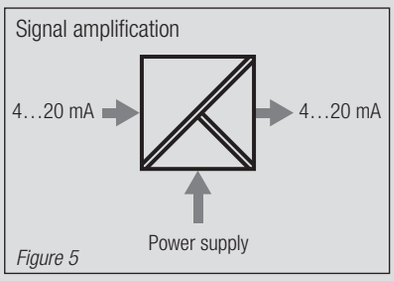


Figure 5

Explosion protection through intrinsic safety

1. General aspects

For the acquisition of signals in hazardous areas, angular position transmitters as well as signal converters of Camille Bauer are designed in the intrinsic safety type of protection “i“. The abbreviation of “i“ is derived from term of intrinsic safety.

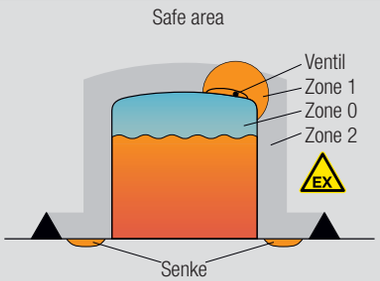
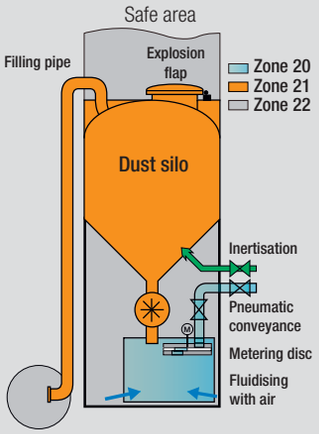
An intrinsically safe circuit cannot cause an ignition of a certain atmosphere under the conditions determined in Standard IEC 60079-11, neither by a spark not by thermal effects. This is applicable to undisturbed operation as well as described failure conditions. Equipment must meet the requirements of surface temperature, clearance and creepage distances, labelling as well as the allocation of the electrical equipment to areas of use and zones.

2. Function

The intrinsic safety type of protection uses the fact that a certain energy is required to ignite a hazardous environment. A circuit is intrinsically safe, if the current and voltage values as well as the energy stored in coils and condensers are limited.

3. Zone classification

Hazardous environments are classified in standardised zones, in which gas and dust incentive hazardous areas are differentiated.

Zones for hazardous areas due to gas		
Example	Zones	Type of danger
	Zone 0	Gas is permanently and for a long time present
	Zone 1	Gas occurs occasionally
	Zone 2	Gas does normally not occur or only for a short period of time
Zones for hazardous areas due to dust		
	Zone 20	Dust is permanently and for a long time present
	Zone 21	Dust occurs occasionally
	Zone 22	Dust does normally not occur or only for a short period of time

4. Intrinsically safe equipment

Intrinsically safe equipment is installed in a respective hazardous zone. All of the circuits of such equipment must be designed intrinsically safe. The intrinsically safe equipment of Camille Bauer comprises:

- Angular position transmitters
- Position transmitters
- Programmable temperature transmitters

5. Pertaining equipment

Pertaining equipment is exclusively installed outside of hazardous zones. It has the task of safe coupling of electrical signals into hazardous zones or discoupling out of them. The circuits of pertaining equipment must be designed, examined and certified in accordance with construction regulations in relation to external voltage influences by non-intrinsically safe circuits and concerning the intensity of voltage and circuit values. The pertaining equipment of Camille Bauer comprises:

- Passive isolators
- Power supply units
- Alarm units
- Programmable isolation amplifiers
- Programmable universal transmitters
- Programmable temperature transmitters

6. Level of protection

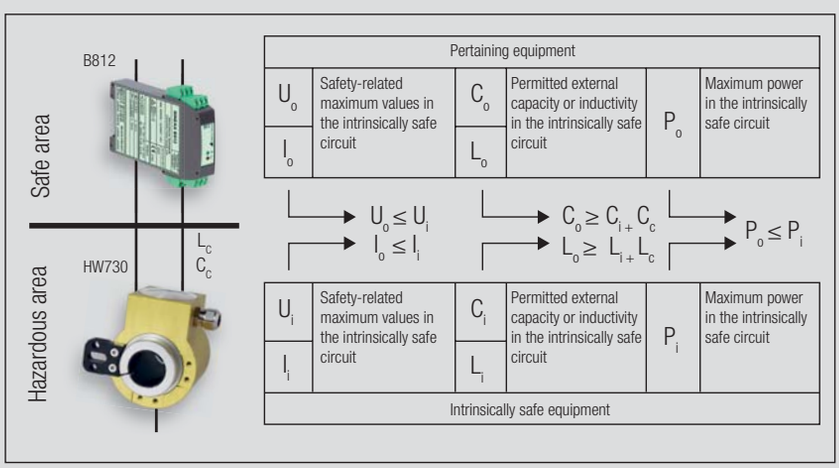
The safety of an intrinsically safe circuit is based on the components used and their susceptibility to failure. Components susceptible to failure are, for example, semiconductors and condensers while relays, transformers and film resistors are considered not to be susceptible to failure.

The reliability of the overall device is evaluated on basis of the components used and the design of the intrinsically safe circuits. The devices are classified in 3 levels of protection:

Protection levels according to EN 60079-11		
Protec-tionlevel	Failure consideration	Permitted zones
ia	Does not cause an ignition, if any combination of two errors occurs in normal operation	0, 1, 2
ib	Does not cause an ignition, if one error occurs in normal operation	1, 2
ic	Does not cause an ignition in normal operation	2

7. Interconnection of intrinsically safe and pertaining equipment

An intrinsically safe circuit always consists of at least one intrinsically safe and one pertaining item of equipment. When interconnecting them, the safety-oriented values of the intrinsically safe and the pertaining item of equipment must be harmonised. The user is responsible for the safe interconnection of intrinsically safe and pertaining equipment.

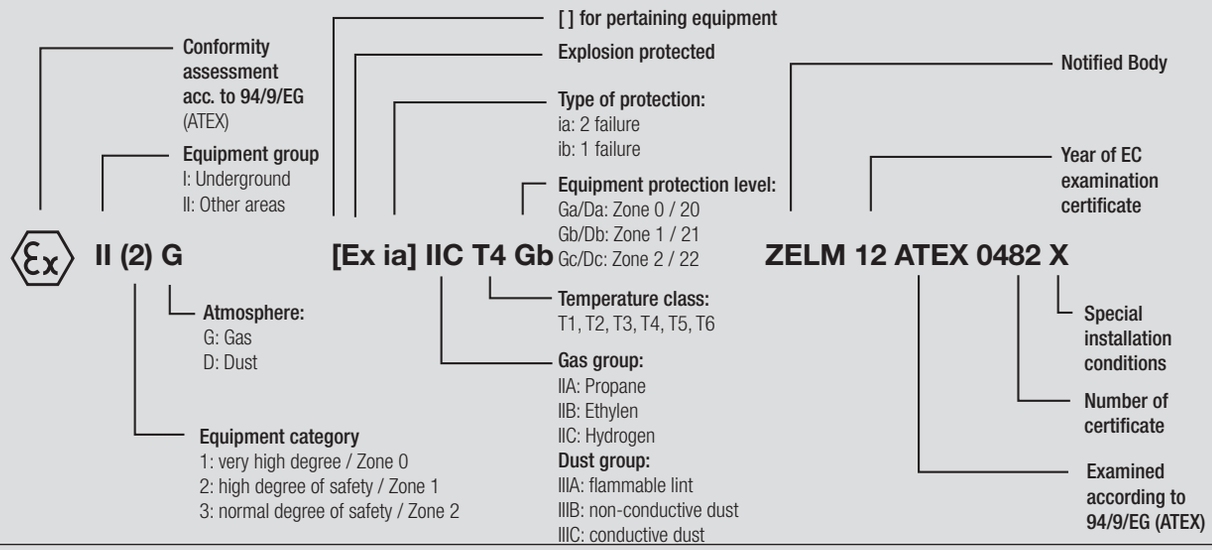


Test criteria of an intrinsically safe circuit using the examples of B812 and HW730

Intrinsically safe and pertaining equipment

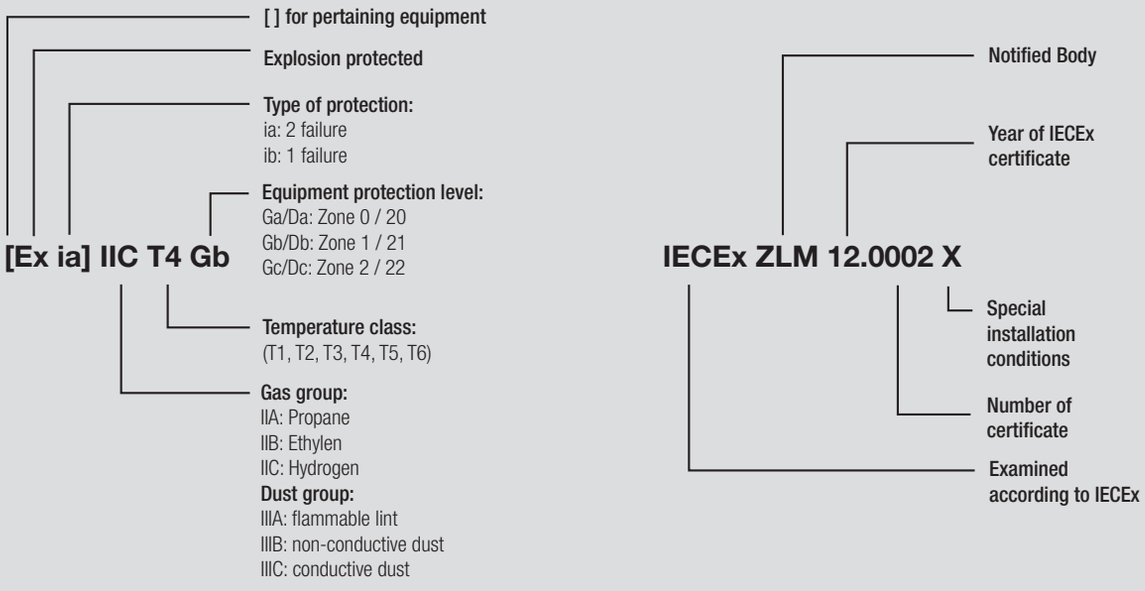
Labelling for electrical equipment according to ATEX

Labelling according to the ATEX directive	Labelling according to EN 60079-0 IEC 60079-0	EC examination certificate



Labelling for electrical equipment according to IECEx

Labelling according to EN 60079-0 IEC 60079-0	IECEx certificate



Intrinsically safe and pertaining equipment

Hazardous area
Intrinsically safe equipment
Zone classification 0 – 2 and 20 – 22, equipment group 1 – 3

Gas: Zone 0
Dust: Zone 20
Equipment group 1

Gas: Zone 1
Dust: Zone 21
Equipment group 2

Gas: Zone 2
Staub: Zone 22
Equipment group 3

VK616

Programmable head transmitter

II 2 (1) G Ex ia IIC T6

VK626

Head transmitter with HART-Protocol

II 2 (1) G Ex ia IIC T6

V608

Programmable temperatur transmitter

II 2 (1) G Ex ia IIC T6

HW730

Hollow-shaft transmitter for angular position

II 2 G Ex ia IIC T4 Gb
II 2 D Ex ia IIIC T80°C Db
II 2 D Ex tb IIIC T80°C Db

WT710/WT711

Shaft transmitter for angular position

II 2 (1) G Ex ia IIC T6

WT707 / WT717

Transmitters for angular position

II 2 G Ex ia IIC T6

3W2 / 2W2

Transmitters for angular position

II 2 G Ex ia IIC T6

SR709

Position transmitter

II 2 G Ex ia IIC T6

Safe area
Pertaining equipment

TI807

One or multichannel passive isolator

II (1) G [Ex ia] IIC
II (2) G [Ex ib] IIC

2I1

Passive signal isolator

II (1) G [Ex ia] IIC
II (2) G [Ex ib] IIC

PK610

Programming cable

II (1) G [Ex ia] IIC

PRKAB600

Programming cable

II (1) G [Ex ia] IIC

B811

Power supply unit with additional functions

II (1) G [Ex ia] IIC

B812

Standard power supply unit

II (1) G [Ex ia] IIC
II (1) D [Ex iaD] IIIC

SI815

Loop-powered supply unit with HART protocol

II (1) G [Ex ia] IIC

C402

Alarm units

II (1) G [Ex ia] IIC

TV809

Programmable isolation amplifier

II (1) G [Ex ia] IIC
II (1) D [Ex iaD] IIIC

TV808

Configurable isolation amplifier

II (1) G [Ex ia] IIC

V604

Programmable universal transmitter

II (1) G [Ex ia] IIC

VC603

Programmable combined transmitter / alarm units

II (1) G [Ex ia] IIC

V624

Programmable temperature transmitter

II (1) G [Ex ia] IIC
II (1) D [Ex iaD] IIIC

Intrinsic safety in temperature measurement

Temperature is the most frequently measured physical variable. The market thus offers numerous applications and instruments in this respect. For temperature measurements in partly closed processes, sheathed thermometers are mainly used. A sheathed thermometer contains a head transmitter which transforms the sensor signal into a mA norm signal. Different instrument designs are used in hazardous areas.

The Camille Bauer instruments for hazardous areas are designed for simple applications through to those with fieldbus connection. Different instrument versions are available. On the one hand, these are 2-wire transmitters for top-hat rail installation and, on the other hand, head transmitters with the options of galvanic isolation, programming functions (also HART programming) and fieldbus connection (FISCO). Outside of hazardous areas, temperature transmitters with or without programming or online analysis are used.
$U_i \geq U_0$, $I_i \geq I_0$ and $P_i \geq P_0$ generally applies to the proof of intrinsic safety. The „i“ stands for input and refers to the passive equipment. The „o“ stands for output and characterises the active equipment. L_i- and C_i-data – together with L_0- and C_0-values as well as the capacitance or inductivity of the cable (C_k, L_k) – defines the maximum installation length of the connecting lead. Length l is calculated as follows:
$l = C / C_k$ with $C = C_0 - C_i$.

The same is analogously applicable to inductance values in which the capacitance values mostly determine the length of the lead. These values are stated in the respective type-examination certificate or the data sheet.

Certified sensors:
The manufacturer is responsible.
The type-examination certificate states U_i, I_i, P_i, C_i and L_i data as well as the temperature class and the gas group of passive sensors. If one of the U, I or P values is missing, any value may usually be used. If a C or L value is missing, the same has to be taken as ~0. The length should be calculated, on principle, even though the connecting leads are short in the sensor tube.

Head transmitter (Connection for power supply unit)	*Power supply unit*
$U_i = 30$ V	$U_0 = 21$ V
$I_i = 160$ mA	$I_0 = 75$ mA
P_i max. 1 W	$P_0 = 660$ mW
L_i, $C_i \sim 0$	$C_0 = 178$ nF $L_0 = 6.7$ mH

Table 1. Specimen parameters for the connection of the head transmitter to a power supply unit.

Non-approved sensors:
The user is responsible
In relation to standards, temperature sensors are so-called low-end intrinsically safe equipment and certificates are not obligatory (Zones 1, 2). Users can calculate themselves the maximum ambient temperature permitted using technical characteristic values (thermic resistance) and the classification into a suitable temperature class according to EN 60 079-14 Section 12.2.5. In addition, there is the classification into a gas group as well as the evaluation of the housing and the separating distances. In view of these requirements, the evaluation should be performed by a skilled person.

Connection to the power supply unit
As the head transmitter is connected to the power supply unit, the transmitter is passive and the power supply unit active for the proof of intrinsic safety. Table 1 contains an example.

Figure 1. Ex-i proof for HART programming in the certificate.

The calculation of the maximum length of the lead between both instruments shows that with $C_0 = 178$ nF considerably more capacitance is available than usual. To achieve this, a small U_0 was endeavoured during development. The head transmitter does not have any C_i either which is intended in order to have the 178 nF completely available for the connecting lead. In standard leads with 120 nF/km, a maximum length of l = 1.483 km results. A calculation based on L_0 permits an even longer cable; however, the lower of the two values is applicable.

Field programming:
Permitted or not?
In transmitter programming, an additional wattage entry by laptop or PC is effected in most cases. The Ex data of the head transmitter may be influenced in programming depending on the design. The devices take this additional wattage into consideration in the type-examination certificate. For example, (re) programming of a running facility (sensor in the Ex area) is possible if a fire permit is available.

Galvanic isolation solves the problem of double earthing
One selection criterion is the galvanic isolation between the supply and sensor connection. Particularly in Ex devices it is recommended to use galvanically isolated instruments in order to prevent possible earthing problems. If the measuring circuit is earthed in welded sensors, the supply circuit must not be earthed in low-end devices without galvanic isolation.

HART terminal: Connection permitted?
Transmitters may easily be programmed or read in the field using the HART protocol. The required handheld terminal should be connected to the non-Ex circuit or the provided connection of the power supply unit. However, if users must connect the handheld terminal (in the Ex-i type of protection) to the intrinsically safe circuit, e.g. in trouble shooting this is not possible without prior calculation. In relation to intrinsic safety, the handheld terminal is active equipment, has a type-examination certificate and additionally feeds - in the most adverse case - a second wattage into the Ex-i circuit. This is called an interconnection of two active equipment items whose proof of intrinsic safety is detailed in EN 60 079-14 (Section 12.2.5.2. incl.

equipment, has a type-examination certificate and additionally feeds – in the most adverse case – a second wattage into the Ex-i circuit. This is called an interconnection of two active equipment items whose proof of intrinsic safety is detailed in EN 60 079-14 (Section 12.2.5.2. incl. Attachment B). However, the figure „Parallel connection - current addition“ in Attachment B is only applicable to this case if the power supply unit and the handheld terminal have linear output characteristics. If one of the two characteristics is not linear, the proof must be provided on basis of the THEx-10 PTB report. To avoid this work, users are well advised to employ a power supply unit as shown in Figure 1 in which the manufacturer has already taken the connection of a handheld terminal into consideration in the certificate.

FISCO: Fieldbus Intrinsically Safe Concept

The connection of a transmitter to an intrinsically safe bus is easy if all components of the bus system correspond to the FISCO model. If the devices used (a power source, maximum 32 bus devices, two terminating resistors) and leads as well as the interconnection have been designed in accordance with FISCO specifications, the system is considered to be adequately safe. The safety documentation is reduced to listing the equipment used and the certificates. The requirements of the transmitter may be derived from the power sources. The maximum data of these so-called segment couplers are: I_0 = 380 mA, P_0 = 5.32 W and U_0 = 17.5 V. These values are considerably above those of 2-wire technology. Development departments face great challenges if both conventional and bus-compatible head transmitters are to be implemented in the same types of housing. As C_i maximum 5 nF, as L_i maximum 10 mH are permitted, and the devices must be classified in Group IIC and Temperature Class T4.

Alternatives to head transmitters

Head transmitters are often exposed to high temperatures because of their assembly in the immediate vicinity of processes which reduces the useful life of these devices. Users can exclude this disadvantage if they employ a transmitter for rail assembly in hazardous areas. These products are hardly bigger than a terminal which is usually installed in the subdistribution system any way (Figure 2). Top-hat rail adapters for head transmitters have also been developed but they require considerably more space.

Figure 2. „Intelligent terminal“ in the field instead of a transmitter increases packing density.

Temperature transmitters outside of Ex areas

Temperatures may also be measured in the cabinet using compensating cables. Intrinsic safety is again proven by a comparison of U, I and P data. The length of the lead is calculated on basis of C or L parameters, too. Programmable devices ensure that additional programming output does not have any influence on intrinsic safety. Furthermore, the devices can be programmed without a connection to a separate power supply.

Electromagnetic compatibility

What is it all about?
Electromagnetic compatibility (EMC) signifies that electrical and electronical products work safely at their place of use. To safeguard this, the interfering emission of electromagnetic signals of devices, systems or plants must be limited. On the other hand, it must also be safeguarded that devices, systems or plants are not impaired by the interfering signals present in their environment. These relatively simple facts are stipulated in the EMC Directive 89/336/EC and can only be achieved if all those involved play the game. All manufacturers are obliged to test their products accordingly or have them tested.

The CE-mark is the basic precondition that a product may be put into circulation in Europe. In this way, manufacturers confirm that their products conform to applicable directives for their type of product. The EMC directive is an integral part of this requirement profile. Outside of Europe, other identification obligations are partly applicable. These are now harmonised to such an extent that also in relation to EMC comparable requirements can be assumed.

The problem
The increase of electrical and electronical products in the industrial environment but also in products of daily use is still immense. More and more functionality with even higher performance is implemented in these products. Processor systems with increasingly higher clock frequencies are being used. They generate higher and higher levels of interference unintentionally and also become more and more sensitive to interfering sources in their environment.

To make matter worse, the applications using radio frequencies are also increasing. For example, mobile telephones must be in a position of sending and receiving signals. Though their transmission output is limited, incompatibilities might result if they are used inconsiderately in the vicinity of sensitive devices. Systems may be interfered with to such an extent that they provide wrong signals or break down completely. This is the reason, why their use is often limited, e.g. in aircrafts or also in hospitals where sensitive medical devices might be affected. The awareness of EMC problems in aircrafts has been established over years but must still be pointed out to passengers prior to every take-off. When entering a hospital hardly anybody turns of his or her mobile telephone despite warning messages on the walls. Operational managers of power plants are often not aware of the fact that the use of mobile telephones in the vicinity of measuring, controlling and regulating units can be critical. Radio and television stations, mobile radio antennae or remote controls also work with frequencies which might interfere with sensitive devices and impair their operation.

Sources of interference
In the industrial environment, frequency converters, motors and other consumers are increasingly operated parallel to sensitive measuring and control systems. Higher levels of interference must generally be expected in all places where high power is applied, switched or pulsed or electronic systems with high pulse frequencies are used.

The use of wireless telecommunication facilities or networks also increases the probability of incompatible levels of interference in the environment of sensitive equipment.

Standards
Applicable specific basic standards define the requirements of products and systems for use in their original environment. A limited number of tests with evaluation criteria and the expected operating behaviour are determined using defined measuring and test procedures. Specific basic standards contain details of the measuring method and general conditions. Specific EMC standards are available for certain products or product groups and have priority over the general requirements mentioned above.

EMC safety can only be achieved by a complete examination in accordance with standards. Since all standards are interrelated only their sum total provides a satisfactory result. Partial examination is not permitted, however still done by some manufacturers due to lacking measuring equipment or for reasons of costs.

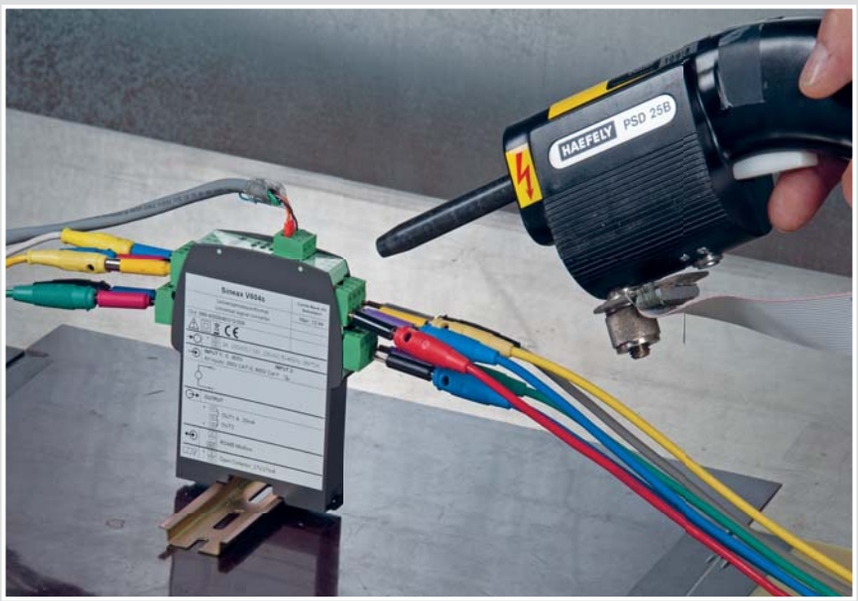
Meeting standards does not necessarily provide smooth operation. A device may be subjected to higher loads in operation than envisaged by the standard. This might be caused by insufficient protection of the equipment or by EMC-incompatible wiring. In such a case, the behaviour of the device is largely undefined since it has not been tested.

Tests at Camille Bauer
Camille Bauer has its own EMC laboratory where the complete scope of all required tests (see below) can be performed. Even if our laboratory is not accredited, comparative measurements at the premises of respective service providers as well as subsequent checks by customers confirmed our test results in each case.

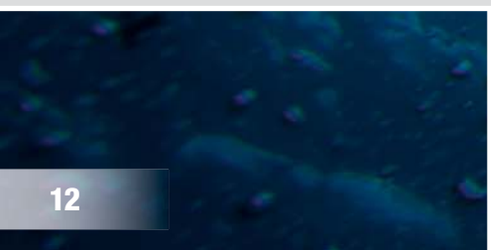
We also test our devices under higher loads than demanded by the standard even if this is not explicitly stated in our data sheets.

Specific basic standards
IEC / EN 61 000-6-2
Immunity standard for industrial environments

IEC / EN 61 000-6-4
Emission standard for industrial environments



Measurement of the behaviour of the devices in voltage dips, brief interruptions or voltage fluctuations of the power supply



Basic standards

IEC / EN 61 000-4-2
Immunity to static discharge which occurs as potential differences – mainly caused by friction electricity – are reduced. The most known effect is surely when persons get charged as they walk across a carpet and discharged with the generation of a spark when they touch a metal part. If this is, e.g., the plug of an electronic device the brief current impulse might be sufficient to destroy the device.

IEC / EN 61 000-4-3
Immunity to high-frequency electromagnetic fields. Typical sources of interference are radiotelephones used by the operating, maintenance or service staff, mobile telephones and transmitting facilities needing these fields. Coupling happens via the air. Unintentional fields also occur in welding facilities, thyristor-controlled inverters or fluorescent lamps. Coupling might as well be generated via the line in such cases.

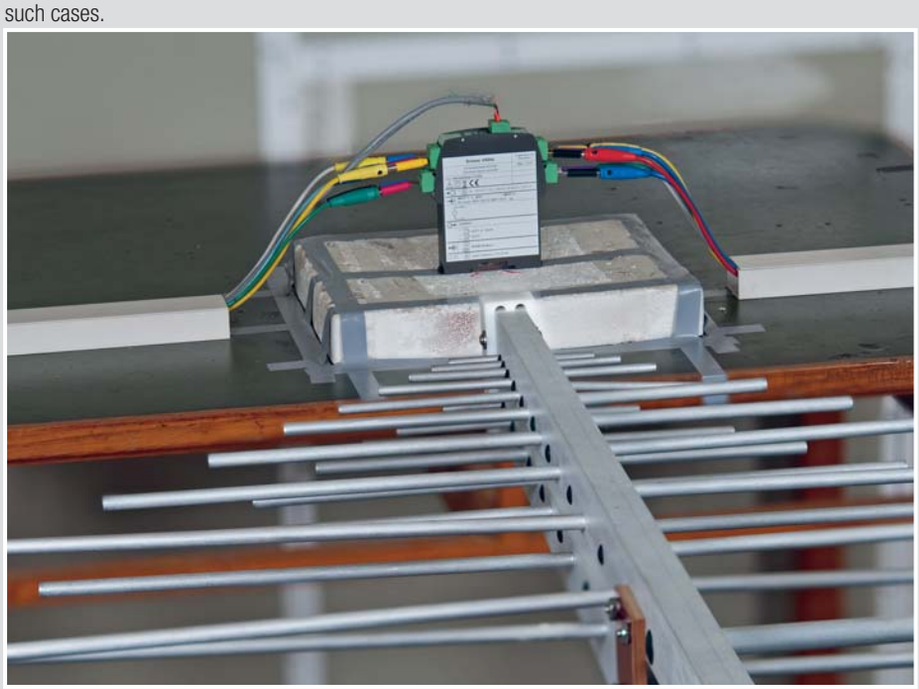
IEC / EN 61 000-4-4
Immunity to fast transient interference variables (bursts) which are generated in switching operations (interruption of inductive loads or bouncing of relay contacts)..

IEC / EN 61 000-4-5
Immunity to impulse voltages (surges) which are generated in switching operations or lightning and arrive at the device via the connecting lines.

IEC / EN 61 000-4-6
Immunity to conducted disturbances, induced by high-frequency fields which are typically generated by radio transmission facilities. Coupling takes place via the connecting line of the device. For further sources of interference see 61000-4-3.

IEC / EN 61 000-4-8
Immunity to magnetic fields with power frequencies. Strong magnetic fields result, e.g., in the immediate vicinity of power lines or bus bars.

IEC / EN 61 000-4-11
Immunity to voltage dips, brief interruptions and voltage fluctuations. Dips and brief interruptions of the supply voltage result from errors in the supply system or when large loads are switched. Voltage fluctuations are caused by fast-changing loads, e.g. in arc furnaces, and also generate flickering.



Determination of device behaviour under the influence of a magnetic external field generated by a Helmholtz coil

Basics controllers and control systems

These controllers and control systems are professional tools for optimized, top quality control performance. Their compact design and universal adaptability make them an ideal companion for worldwide use. All relevant control process data are recorded in close to real-time using options created especially for the controllers, allowing for detailed disturbance analysis. User-friendly tools for initial start-up, remote diagnosis and remote maintenance support and simplify all tasks performed in actual practice. Their diverse functions and expandability make them truly multi-talented control instruments.

Filter and functions with disturbed controll variables

Peak filter
Individual erroneous measurements caused by, for example, electrostatic discharge to the sensor, are suppressed.

Smoothing filter
In accordance with controlled system dynamics, several measured values are combined for control purposes to avoid an unsteady controlled variable.

Actual value correction, Actual value factor
Linear correction of measured values, if, amongst other factors, measured temperature deviates from the temperature to be measured / to be displayed due to a temperature gradient.

Adaptive measured value correction
Suppression of constant periodic or slowly changing oscillation.

Oscillation disabling
Suppression of oscillation with a constant period. (Oscillation period 3…200 clock cycles))

Feed-forward control
Suppression of controlled variable swells and dips in the event of load fluctuations, e.g. caused by operation/standstill of a machine / system

Response in event of sensor failure, sensor error manipulating factor
If operation must be continued with a defective sensor, the controller reads out a plausible manipulated variable in order to maintain the working level.

Functions

Two-Step Controllers
Two-step controllers trigger actuators in two steps, in both cases through the use of ON and OFF signals. As part of this process, the control algorithm assures that the actual value approaches the setpoint without overshooting.

Three-Step Controller
Three-step controllers are utilized when controlling the process necessitates the use of three switching conditions. Some processes require heating, as well as cooling from time to time. Thus three switching conditions are possible: HEAT, OFF and COOL.

Three-Step Step-Action Controllers
Three-step step-action controllers are used when controlling a process necessitates a continuous volumetric flow rate. Discontinuous step-action actuators cannot be used in this case: motor actuated valves with an infinite setting range are required instead. Travel to all valve positions, and thus any desired manipulating factor, is possible with the OPEN, STANDSTILL and CLOSE signals.

Continuous-Action Controllers
Continuous action controllers are used when a continuous control variable is required for controlling the process. The output signal is either a direct current (0/4 to 20 mA) or a direct voltage (0/2 to 10 V). Actuators manipulated by these signals are usually thyristor power controllers or RPM controllers.

Hot-Runner Controllers
Extremely compact hygroscopic cartridge heaters are used for injection moulds, which are made of a material which absorbs moisture when cooled down. Heat-up must take place slowly in order to avoid converting absorbed moisture into steam and damaging the cartridge heater. Hot-runner controllers are equipped with a startup ramp and provide a very fast switching, reduced actuator signal, thus preventing vapor build-up. After the heat-up process has been completed, the controller performs just like a normal two-step controller.

Fixed Value Control
The setpoint is permanently set to a constant value at the controller in the case of fixed value control. Fixed setpoint controllers are used to correct interference, and are thus laid out for good interference performance.

Follow-Up Control
The setpoint is specified at the controller by external devices in the case of follow-up control (e.g. as a linear current signal within a range of 4 to 20 mA). The follow-up controller is assigned the task of readjusting a physical quantity in accordance with a continuously changing setpoint.

Ratio Control
Ratio control is a special type of follow-up control. It is used to keep the specified ratio between two process quantities constant. The desired ratio is set at the controller.

Differential Control
The differential setpoint of two process quantities is adjusted to a fixed value, which is selected at the controller, by means of differential control.

Cascade Control
Control performance can be significantly improved for difficult to control processes with cascade control. Two controllers are usually required to this end: one master controller and one follow-up (or slave) controller. This type of system is characterized by the fact that the output quantity of the master controller is the command variable for the follow-up controller.

Program Control
With program controllers, the setpoint is selected automatically according to a time profile which has been saved to the controller. Several profiles can be saved.

Setpoint 2
Energy is saved during production breaks with the use of a reduced setpoint value. Setpoint 2 is activated by means of an internal, or an external signal.

Setpoint Ramp
Gentle heat-up or cool-down is made possible for temperature sensitive materials by selecting an appropriate gradient. The selected gradient determines the rate of temperature change until the setpoint value is reached.
Heating Circuit Monitoring
The heating circuit function is monitored without any additional hardware. After switching the heat on, the controller detects temperature rise and compares it with anticipated change based upon control parameters. Excessive deviation is indicated.
Heating Current Monitoring
A current transformer is installed in order to monitor the function of the heating circuit. After switching the heat on, the controller acquires heating current and compares it with the selected current setpoint value. Deviation is indicated.

pH Control
The pH value is a measure of the strength of the acidic or alkaline action of an aqueous solution. The term itself is derived form the Latin pondus hydrogenii: pondus means weight and hydrogenium means hydrogen. The pH value is one of the most important chemical quantities. Its ascertainment and control are standard in many industrial applications including wastewater treatment and quality control for liquids. The desired pH value of a liquid can be precisely adjusted by influencing the concentration of acids and leaching agents. If a liquid needs to be neutralized, especially great demands are placed upon the reliability and the accuracy of the regulating process. The greatest challenges of pH value control include the unusually large measuring range which encompasses 14 powers of ten, and the long “dead time”.

Overview passive signal converters

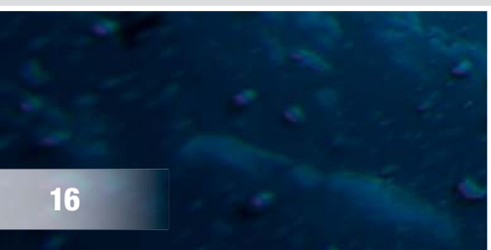
VK615	VK616	VK626	V608	V610	V611	
						
Head transmitter	Programmable head transmitter	Head transmitter with HART protocol	Head transmitter with Profibus interface	Temperature transmitter for Pt100	Programmable temperature transmitter	
Pt100 Pt1000 → mA	RTD TC → mA	RTD TC → mA	RTD TC → 4...20mA	Pt100 → 4...20mA	RTD TC → mA	
22	22	23	23	24	24	Page

VS30	TI816	2I1	DCM 817	TI801	TI802	
						
Programmable temperature transmitter	Passive signal isolator	Passive signal isolator	Passive signal isolator module	Passive signal isolator, loop-powered	Passive signal isolator, 2-channel, loop-powered	
Pt100 Ni100 → mA	0...20mA → 0...20mA 0...10V	0...20mA → 0...20mA	0...20mA → 0...20mA 0...10V	4...20mA → 4...20mA	4...20mA → 4...20mA; 4...20mA → 4...20mA	
25	26	26	27	27	27	Page

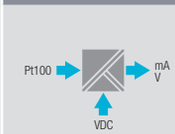
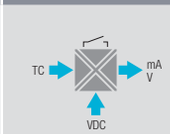
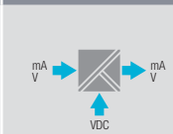
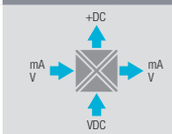
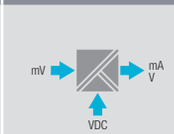
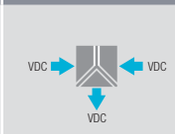
TI807	SI815	
		
One or multichannel passive isolator	Loop-powered supply unit with HART protocol	
0...20mA → 0...20mA 0...10V	4...20V → 4...20V	
28	28	Page

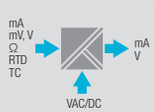
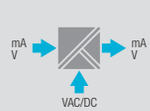
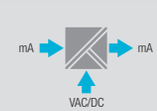
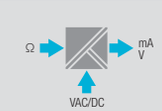
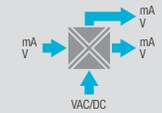
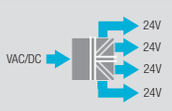
Legende

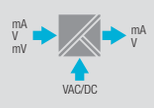
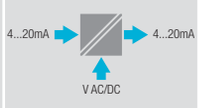
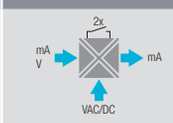
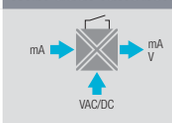
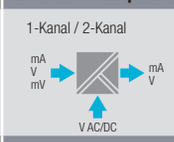
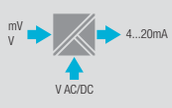
- Devices without galvanic isolation
- Devices with galvanic isolation
- Compatible with CB-Power-Bus



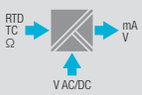
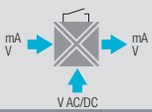
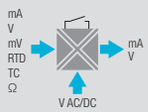
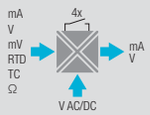
Overview active signal converters

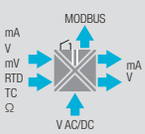
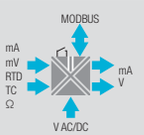
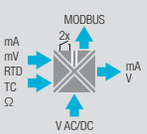
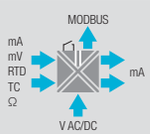
	VS40	VS46	VS50	VS52	VS54	VS70
						
	Pt100 converter	Thermocouple converter with alarm unit	Galvanic isolator/ analogue converter	Isolating amplifier with transmitter supply	Current shunt / V-I converter	Power supply for the CB-power-bus
						
Page	32	32	36	36	37	42

	V620/V622	TV810	TV804	TP619	TVD820	B840
						
	Universal converter / isolating amplifier	DC current-voltage isolating amplifier	DC current isolating amplifier	Potentiometric to DC isolating amplifier	DC duplicator / isolating amplifier	4-channel power supply unit
						
Page	33	37	38	38	39	41

	TV819	B812	C402	B811	TV808	TV829
						
	Isolation amplifier	Standard power supply unit	Alarm units	Power supply unit with add. functions	Configurable isolation amplifier	High voltage isolation amplifier
						
Page	34	41	40	40	34/35	39

Overview multifunctional signal converters

V624	TV809	V604	VC603	
				
Programmable temperature transmitter	Programmable isolation amplifier	Programmable universal transmitter	Programmable combined transmitter / alarm units	
				
46	47	48	49	Page

V604s	VB604s	VC604s	VQ604s	
				
Programmable multifunctional transmitter	Programmable multifunctional transmitter with REMOTE I/O functio-nality	Programmable Safety Value Converter	Programmable multifunctional transmitter with very fast setting times	
				
52	53	54	55	Page

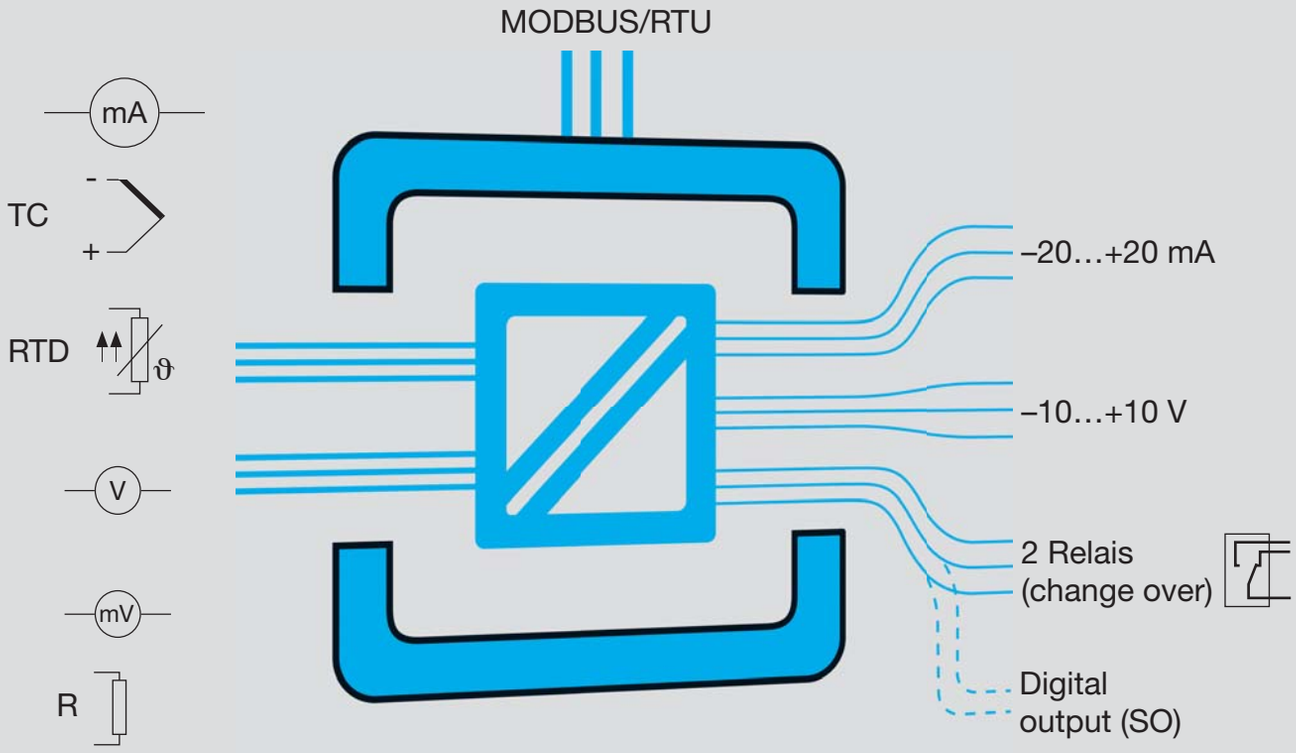
Legende

Devices without galvanic isolation

Devices with galvanic isolation

Compatible with CB-Power-Bus

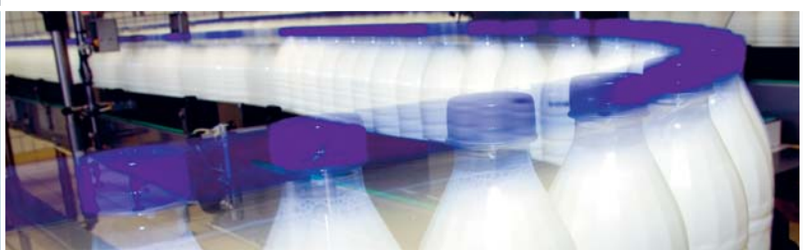
Multifunctional signal converters - As versatile as a Swiss army knife



Passive signal converters

2-wire technology.
These signal converters do not need any separate power supply. The energy is directly provided by the measuring signal as a voltage drop at the input terminals. Passive signal converters are available as temperature transmitters, DC signal separators as well as signal separators with simultaneous power transmission to the measuring circuit.

Content passive signal converters



SINEAX VK615

Head transmitter

with firmly set measuring ranges

Customer benefit
- Delivered in calibrated condition
- Manual zero and span calibration
- Reverse polarity protected connections
- Sensor breakage and short-circuit monitoring

Technical data
Input: Pt100, Pt1000, 2 or 3-wire connection
Output: 4…20 mA, 12…30 V

Stock variants

Article No.	*Description*
154 873	0…100 °C, Pt 100, 2 or 3-wire connection
154 881	0…150 °C, Pt 100, 2 or 3-wire connection
154 899	0…200 °C, Pt 100, 2 or 3-wire connection
154 906	–30…+70 °C, Pt 100, 2 or 3-wire connection
154 914	–50…+150 °C, Pt 100, 2 or 3-wire connection

SINEAX VK616

Programmable head transmitter

without galvanic isolation

with galvanic isolation

with or without galvanic isolation

These devices are available both in Ex design and non-Ex design.

Customer benefit
- Programmable even without power supply connection
- Applications in hazardous areas (Zone 1)
- Reverse polarity protected connections
- Sensor breakage and short-circuit monitoring

Technical data
Input: Pt100, Ni100 as well as other sensor types in 2, 3 or 4-wire connection
Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re
Output: 4…20 mA, 12…30 V
Ø x height: 43 x 16.8 mm (without galvanic isolation)
43 x 30.8 mm (with galvanic isolation)

Stock variants

Article No.	*Description*
137 845	Without galv. isolation, non-Ex design, internal cold junction compensation
137 853	Without galv. isolation, Ex design EEx ia IIC T6, int. cold junction compensation
137 861	With galv. isolation, non-Ex design, internal cold junction compensation
137 879	With galv. isolation, Ex design EEx ia IIC T6, int. cold junction compensation

Accessories
Configuration software see page 68, PC connecting cable see page 71

SINEAX VK626

Head transmitter with HART protocol

with galvanic isolation

These devices are available both in Ex design and non-Ex design.

Customer benefit
- Programmable via HART protocol
- Applications in hazardous areas (Zone 1)
- Reverse polarity protected connections
- Sensor breakage and short-circuit monitoring

Technical data

Input:	Pt100, Ni100 as well as other sensor types in 2, 3 or 4-wire connection Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re
Output:	4…20 mA, 12…30 V
Ø x height:	43 x 30.8 mm

Stock variants

Article No.	*Description*
141 424	Non-Ex design, internal cold junction compensation
141 432	Ex design EEx ia IIC T6, internal cold junction compensation

SINEAX V608

Programmable temperature transmitter

for top-hat or G-rail assembly, 2-wire

These devices are available both in Ex design and non-Ex design.

Customer benefit
- Programmable even without power supply connection
- Applications in hazardous areas (Zone 1)
- Reverse polarity protected connections
- Sensor breakage and short-circuit monitoring

Technical data

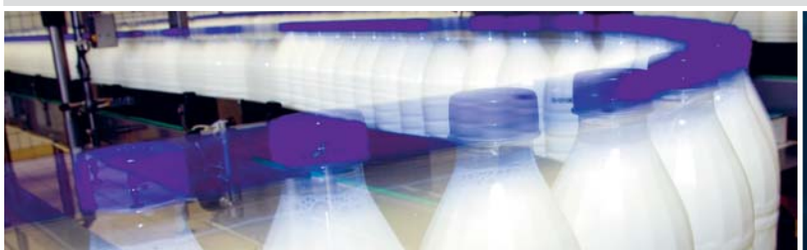
Input:	Pt100, Ni100 as well as other sensor types in 2, 3 or 4-wire connection Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re
Output:	4…20 mA, 12…30 V
Height x width x depth:	62 x 17 x 67 mm (incl. top-hat rail) 62 x 17 x 72 mm (incl. G-rail)

Stock variants

Article No.	*Description*
141 515	Non-Ex design, internal cold junction compensation
141 523	Ex design EEx ia IIC T6, internal cold junction compensation

Accessories

Configuration software see page 68, PC connecting cable see page 71



SINEAX V610

Temperature transmitter for Pt100

for top-hat or G-rail assembly, 2-wire

Customer benefit
- Sensor breakage and short-circuit monitoring
- Narrow design
- Serial mounting without any limitation
- Reverse polarity protected connections

Technical data

Input:	Pt100 in 3-wire connection
Output:	4…20 mA, 12…30 V
Height x width x depth:	90.2 x 7 x 86 mm (incl. top-hat rail) 90.2 x 7 x 91 mm (incl. G-rail)

Stock variants

Article No.	*Description*
154 823	0…100 °C
154 831	0…150 °C
154 849	0…200 °C
154 857	–30…+70 °C
154 865	–50…+150 °C

SINEAX V611

Programmable temperature transmitter

for top-hat or G-rail assembly, 2-wire

Main features
- Narrow design
- Serial mounting without any limitation
- Programmable even without power supply connection
- Sensor breakage and short-circuit monitoring

Technical data

Input:	Pt100, Ni100 as well as other sensor types in 2, 3 or 4-wire connection Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re
Output:	4…20 mA, 12…30 V
Height x width x depth:	90.2 x 7 x 86 mm (incl. top-hat rail) 90.2 x 7 x 91 mm (incl. G-rail)

Stock variants

Article No.	*Description*
152 504	Internal cold junction compensation

Accessories
Configuration software see page 68, PC connecting cable see page 71

SINEAX VS30

Pt100, Ni100 loop powered converter

for toprail assembly

Main features

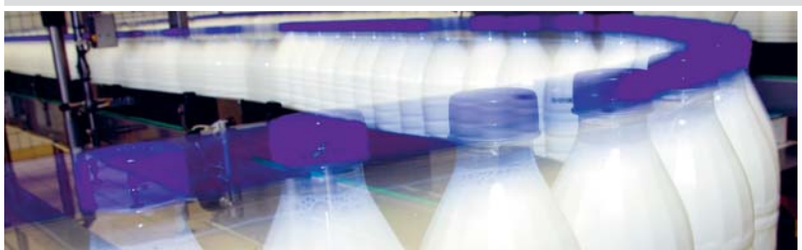
- Spring-cage clamp connection
- Compact design, width only 6.2 mm
- Accuracy 0.1%
- Programming via DIP-switch or software

Technical data

Input:	Pt100 (–200...+ 650 °C), Ni100 (–60...+ 250 °C)
Output:	4...20 mA or 20...4 mA
Power supply:	5...30 V DC (2 wire connection)
Height x width x depth:	93,1 x 6,2 x 102,5 mm (incl. top-hat rail)

Stock variants

Article No.	*Description*
162 769	SINEAX VS30



SINEAX TI816

Passive signal isolator

for the galvanic isolation of 0…20 mA signals, test voltage 500 V

Customer benefit
- Current or voltage output for standard signals
- Compact design
- High degree of accuracy

Technical data

Input:	0…20 mA
Output:	0…20 mA, 0…10 V
Test voltage:	500 V
Voltage drop:	2.1 V
Height x width x depth:	75 x 12.5 x 49.5 mm (incl. top-hat rail) 75 x 12.5 x 52 mm (incl. G-rail)

Stock variants

Article No.	*Description*
990 722	Output 0…20 mA
994 089	Output 0…10 V

SINEAX 2I1

Passive signal isolator

for the galvanic isolation of 0…20 mA signals, test voltage 4 kV

These devices are available both in Ex design and non-Ex design.

Customer benefit
- Isolates signals for hazardous areas
- Robust, tried and tested design
- Exact representation of the current signal

Technical data

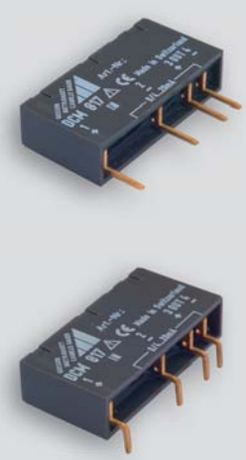
Input:	0…20 mA
Output:	0…20 mA
Test voltage:	4 kV
Voltage drop:	3 V (non-Ex design), 6 V (Ex design)
Height x width x depth:	95 x 24 x 69.5 mm (incl. top-hat rail) 95 x 24 x 74 mm (incl. G-rail)

Stock variants

Article No.	*Description*
154 253	Non-Ex design
154 279	Input: 0…20 mA Ex design [EEx ib] IIC
154 287	Output: 0…20 mA Ex design [EEx ia] IIC
154 261	Increased weathering resistance

DCM 817

Passive signal isolator module



for the galvanic isolation of 0…20 mA signals

Customer benefit
- Exact representation of the current signal
- Plug-in or solderable module design
- Space-saving design

Technical data

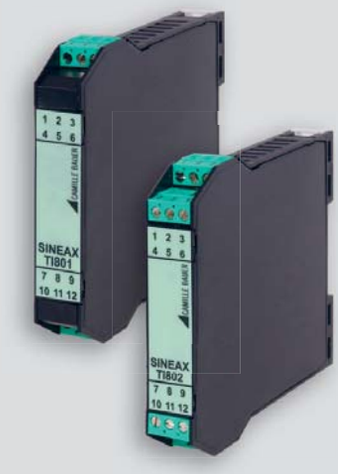
Input:	0…20 mA
Output:	0…20 mA
Test voltage:	500 V
Voltage drop:	2.1 V
Height x width x depth:	21 x 41 x 10.3 mm

Stock variants

Article No.	*Description*
988 727	Straight connecting pins
988 719	Angled connecting pins

SINEAX TI801/802

Passive Isolator, loop-powered



Passive isolator (loop-powered) mA to mA

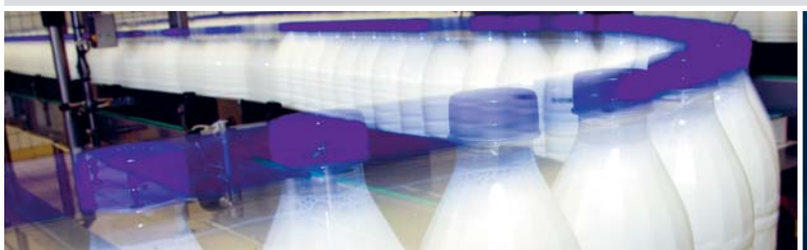
Customer benefit
- Power supply: self powered from the input (primary) loop
- Channel to channel isolation of 1.5 kV

Technical data

Input:	1 or 2 channels, 4…20 mA
Output:	1 or 2 channels, 4…20 mA
Voltage drop:	max. 7 V (load-dependent)
Height x width x depth:	100 x 17.5 x 112 mm

Stock variants

Article No.	*Description*
162 884	SINEAX TI801 (1 channel)
162 892	SINEAX TI802 (2 channel)



SINEAX TI807

One or multichannel passive signal isolator


N17


S17

for the galvanic isolation of 0…20 mA signals, test voltage 4 kV

These devices are available both in Ex design and non-Ex design.

Customer benefit
- Current or voltage output for standard signals
- High degree of accuracy
- Isolates signals for hazardous areas
- Up to 3 channels on a width of 17.5 mm

Technical data

Input:	0…20 mA
Output:	0…20 mA, 0…10 V
Test voltage:	4 kV
Voltage drop:	2.8 V (non-Ex design), 4.7 V or 6.3 V (Ex design)
Height x width x depth:	84.5 x 17.5 x 107.1 mm (N17 housing) 120 x 17.5 x 146.5 mm (S17 housing)

Stock variants

Article No.	*Housing*	*Description*
999 154	N17	1 channel, input: 0…20 mA, output: 0…20 mA, non-Ex design
999 196	N17	1 channel, input: 0…20 mA in [EEx ib] IIC, output: 0…20 mA
999 170	N17	1 channel, input: 0…20 mA, output: 0…20 mA in [EEx ib] IIC
995 061	S17	2 channels, input: 0…20 mA, output: 0…20 mA, non-Ex design
996 936	S17	3 channels, input: 0…20 mA, output: 0…20 mA, non-Ex design

SINEAX SI815

Loop powered supply unit with HART protocol


N17


S17

to energise 2-wire transmitters

These devices are available both in Ex design and non-Ex design.

Customer benefit
- No power supply connection required
- HART pass-through
- 1:1 transmission of the 4…20 mA signal
- Suitable for the supply of transmitters in Ex areas

Technical data

Input:	4…20 mA, voltage 12…30 V DC
Output:	4…20 mA Supply voltage = input voltage – voltage drop
Voltage drop:	2.7 V (without HART and Ex) up to 8.7 V (with HART and Ex)
Height x width x depth:	84.5 x 17.5 x 107.1 mm (N17 housing) 120 x 17.5 x 146.5 mm (S17 housing)

Stock variants (only N17 housing)

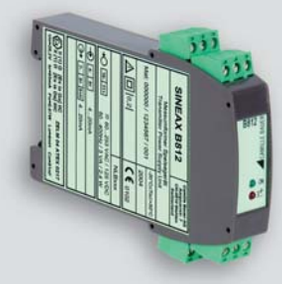
Article No.	*Description*
999 279	Without HART, non-Ex design
999 295	With HART, non-Ex design
999 310	Without HART, Ex design [EEx ia] IIC
999 336	With HART, Ex design [EEx ia] IIC

Power supply unit for 2-wire transmitter

SINEAX B811

HART comprehensive power supply unit for EX and non-EX areas.
With relay for failure alarm.

For further information see page 40.



SINEAX B812

HART comprehensive power supply unit for EX and non-EX areas.
In compact design with wide area power pack.

For further information see page 41.

SINEAX B840

Cost-effective power supply unit with 4 channels and supply circuit monitoring.

For further information see page 41.

SINEAX VS70

Power supply unit for CB-Power Bus. Suitable for redundant voltage supply.

For further information see page 42.

Active signal converters

including a power supply connection - 4-wire technology. These signal converters feature a power supply with galvanic isolation from the measuring circuit. This enables them to convert signals in a non-reactive manner, to separate the signals galvanicly from each other and to amplify them.

Content active signal converters

SINEAX VS40

Pt100 converter

for toprail assembly

Main features
- 3-way galvanic isolation
- Spring-cage clamp connection
- Power bridging terminal DIN rail bus connector
- Compact design, width only 6.2mm
- Minimal range: 50 °C
- Accuracy 0.1%

Technical data

Input:	Pt100 (2-, 3-, 4 wire) (–150…650 °C)
Output:	current 0/4…20 or 20…4/0 mA or voltage 0…5/10, 10…0, 1...5 V DC
Test voltage:	1.5 kV
Height x width x depth:	93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

Stock variants

Article No.	*Description*
162 751	SINEAX VS40

Compatible with CB-Power-Bus

SINEAX VS46

Thermocouple converter with alarm unit

for toprail assembly

Main features
- 3-way galvanic isolation
- Spring-cage clamp connection
- Power bridging terminal DIN rail bus connector
- Small dimensions
- Accuracy 0.1%

Technical data

Input:	Thermocouples, types: J, K, E, N, S, R, B, T
Output:	current 0/4…20, 20…4/0 mA or voltage 0…5/10, 10…0 and 1…5 V DC, Solid State Relay for alarm output
Test voltage:	1.5 kV
Height x width x depth:	93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

Stock variants

Article No.	*Description*
162 777	SINEAX VS46

Compatible with CB-Power-Bus

SINEAX V620/V622

Universal converter/isolating amplifier

Universal converter for mA, V, TC, RTD, Ω

Main features
- Isolation: 1500 V AC at 3 ways
- Strobe: Input (control analog output)
- Resolution: Programmable from 11 to 15 bit + sign
- Programmable DIP switch, software or CB-Pocket Configurator

Technical data

Input:	Voltage, current, RTD, TC, NTC, potentiometer, rheostat
Output:	Current 2 ranges 0/4…20 mA Voltage 4 ranges 0/1…5 V, 0/2…10 V
Test voltage:	1.5 kV
Accuracy:	0.1%
Response time:	35 ms (11 bit + sign)
Power supply:	V620: 9...40 V DC, 19...28 V AC V622: 85...265 V AC/DC
Height x width x depth:	100 x 17.5 x 112 mm

Stock variants

Article No.	*Description*
162 834	SINEAX V620, Power supply 9…40 V DC, 19…28 VAC (50…60 Hz)
162 842	SINEAX V622, Power supply 85…265 V AC/DC

CB-Pocket-Configurator

Portable voltage/current simulator meter

For configuration the SINEAX V620 / V622

Main features
- Precision class: 0.1%
- Voltage measuring/simulation: 0...10 V
- Current measuring/simulation: 0...20 mA
- High-luminosity OLED display, 128 x 64 points
- Supply by Ni-Mh 2500 mAh rechargeable batteries

Article No.	*Description*
162 925	CB-Pocket-Configurator

SINEAX TV819

Isolation amplifier

for unipolar and bipolar DC currents and voltages

Customer benefit
- Standard and non-standard signals
- Safe isolation, enhanced up to 600 V (Cat. II) or 1000 V (Cat. I)
- Manual zero and span calibration

Technical data

Input:	–0.1…+0.1 mA to –40…+40 mA, –0.06…+0.06 V to –1000…+1000 V
Output:	–1…+1 mA to –20…+20 mA, –1…+1 V to –10…+10 V
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	69.2 x 17.5 x 114 mm (terminals not pluggable) 85 x 17.5 x 114 mm (terminals pluggable)

Stock variants

Article No.	*Description*
146 862	Power supply 85…230 V AC/DC, terminals pluggable
146 854	Power supply 24…60 V AC/DC, terminals pluggable
146 846	Power supply 85…230 V AC/DC, terminals not pluggable
146 838	Power supply 24…60 V AC/DC, terminals not pluggable

SINEAX TV808-11

Configurable isolation amplifier

for unipolar and bipolar DC currents and voltages

These devices are available both in Ex design and non-Ex design.

Customer benefit
- 36 I/O combinations with jumpers configurable or customised measuring range
- Inputs and outputs for current and voltage in one device
- Intrinsically safe input for signals from hazardous areas
- Manual zero and span calibration

Technical data

Input:	0…20 mA, 4…20 mA, ±20 mA, 0…10 V, 2…10 V, ±10 V or customised
Output:	0…20 mA, 4…20 mA, ±20 mA, 0…10 V, 2…10 V, ±10 V or customised
Power supply:	24–60 V AC/DC or 85–230 V AC/DC
Height x width x depth:	120 x 17.5 x 146.5 mm

Stock variants

Article No.	*Description*
124 404	Power supply: 24…60 V AC/DC, 36 combinations freely selectable, not customised
124 412	Power supply: 85…230 V AC/DC, 36 combinations freely selectable, not customised

SINEAX TV808-115

Isolation amplifier with HART Protocol

for DC currents and voltages and I/P valve positioner

These devices are available both in Ex design and non-Ex design.

Customer benefit

- Intrinsically safe output for I/P valve positioner in hazardous areas
- HART pass-through
- Unipolar and bipolar inputs, standard or customised signal

Technical data

Input:	–1…+1 mA to –20…+20 mA, –0.06…+0.06 V to –20…+20 V
Output:	0…20 mA, 4…20 mA, 20…0 mA, 20…4 mA
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	120 x 17.5 x 146.5 mm

SINEAX TV808-12

2-channel isolation amplifier

for unipolar and bipolar DC currents and voltages

Customer benefit

- 2 isolated channels or 1 input/2 outputs in 17.5 mm design width
- Manual zero and span calibration
- 252 I/O combinations with solder bridges configurable or customised measuring range

Technical data

Input:	Different ranges from 0.06 V to 20 V or 0.1 mA to 20 mA or customised
Output:	0…20 mA, 4…20 mA, ±20 mA mA or customised
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	120 x 17.5 x 146.5 mm

Stock variants

Article No.	*Description*
128 802	2 channels, input 0…20mA, output 0…20 mA, power supply 24…60 V AC/DC
128 810	2 channels, input 0…20mA, output 0…20 mA, power supply 85…230 V AC/DC
128 828	1 input 0…20 mA, 2 outputs 0…20 mA, power supply 24…60 V AC/DC
128 836	1 input 0…20 mA, 2 outputs 0…20 mA, power supply 85…230 V AC/DC

SINEAX VS50

Galvanic isolator/analogue converter

for toprail assembly

Main features
- 3-way galvanic isolation
- Spring-cage clamp connection
- Power bridging terminal DIN rail bus connector
- Compact design, width only 6.2mm
- Accuracy 0.1%

Technical data

Input:	Current 0/4...20 mA or Voltage 0/1...5, 0/2...10, 0...15/30 V DC
Output:	Current 0/4...20, 20...4/0 mA or Voltage 0/1...5, 0/2...10 V DC
Test voltage:	1.5 kV
Height x width x depth:	93.1 x 6.2 x 102,5 mm (incl. top-hat rail)

Stock variants

Article No.	*Description*
162 785	SINEAX VS50

Compatible with CB-Power-Bus

SINEAX VS52

Isolating amplifier with transmitter supply

for toprail assembly

Main features
- 3-way galvanic isolation
- Spring-cage clamp connection
- Power bridging terminal DIN rail bus connector
- Compact design, width only 6.2mm
- Accuracy 0.1%
- With power supply for 2-wire transmitter

Technical data

Input:	Current 0/4...20 mA or voltage 0/1...5, 0/2...10 V DC
Output:	Current 0/4...20, 20...4/0 mA or voltage 0/1...5, 0/2...10 V DC
Test voltage:	1500 V
Height x width x depth:	93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

Stock variants

Article No.	*Description*
162 793	SINEAX VS52

Compatible with CB-Power-Bus

SINEAX VS54

Current shunt/V-I converter

for toprail assembly

Main features
- 3-way galvanic isolation
- Spring-cage clamp connection
- Power bridging terminal DIN rail bus connector
- Compact design, width only 6.2mm
- Accuracy 0.1%

Technical data

Input:	± 25 to ± 2000 mV
Output:	Current 0/4...20, 20...4/0 mA or Voltage 0...5/10, 10...0 and 1...5 V DC
Test voltage:	1.5 kV
Height x width x depth:	93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

Stock variants

Article No.	*Description*
162 800	SINEAX VS54

Compatible with CB-Power-Bus

SINEAX TV810

DC current-voltage isolating amplifier

Isolating amplifier
DC-signal converter (current/voltage)

Main features
- 3-way galvanic isolation
- Power for 2-wire transducers, 20 V DC

Technical data

Input:	Current bipolar setuble up to 20 mA or voltage
Output:	Current or voltage
Test voltage:	1.5 kV
Response time:	35 ms
Power supply:	9...40 V DC, 19...28 V AC
Height x width x depth:	100 x 17.5 x 112 mm

Stock variants

Article No.	*Description*
162 850	SINEAX TV810

SINEAX TV804

DC current isolating amplifier

Isolating amplifier
DC current isolator

Main features
- 3-way galvanic isolatio
- Power for 2-wire transducers, 20 V DC

Technical data

Input:	Current (active or passive)
Output:	Current (active or passive)
Test voltage:	500 V
Response time:	40 ms
Power supply:	9...40 V DC, 19...28 V AC
Height x width x depth:	100 x 17.5 x 112 mm

Stock variants

Article No.	*Description*
162 868	SINEAX TV804

SINEAX TP619

Potentiometric to DC isolating amplifier

Potentiometric signal converter
Potentiometric to DC isolating amplifier

Main features
- 3-way galvanic isolation
- Screw-fit terminals (removable)

Technical data

Input:	Resistor, rheostat, potentiometer
Output:	Current or voltage
Test voltage:	500 V
Accuracy:	0.2%
Power supply:	19...40 V DC, 19...28 V AC
Height x width x depth:	100 x 17.5 x 112 mm

Stock variants

Article No.	*Description*
162 876	SINEAX TP619

SINEAX TVD820

DC duplicator/isolating amplifier

Isolating amplifier
DC-signal duplicator (current/voltage)

Main features
- 3-way galvanic isolation
- Screw-fit terminals removable

Technical data

Input:	Current or voltage
Output:	Current or voltage selectable
Testvoltage:	1.5 kV
Accuracy:	0.2%
Power supply:	19...40 V DC, 19...28 V AC
Height x width x depth:	100 x 17.5 x 112 mm

Stock variants

Article No.	*Description*
162 909	SINEAX TVD820

SINEAX TV829

High-voltage isolation amplifier

for shunt and voltage measurement on high potential

Main features
- Safe galvanic isolation according to DIN EN 61010-1 and DIN EN 50124 (Cat. III)
- High test voltage: 10 kV
- Calibrated range shaft
- High common-mode rejection ratio: 150 dB

Technical data

Input (switch-selectable):	±60 mV, ±90 mV, ±150 mV, ±300 mV, ±500 mV, ±10 V [1] ±400 V, ±600 V, ±800 V, ±1000 V, ±1200 V ±1400 V, ±1600V, ±1800V, ±2000 V, ±2200 V, ±3600 V [2]
Output (switch-selectable):	4…20 mA, ±20 mA, ±10 V
Power supply:	24…253 AC/DC
Height x width x depth:	90 x 22.5 x 118 mm (Article No. 158 312) 90 x 67.5 x 118 mm (Article No. 158 320 and 158 338)

Stock variants

Article No.	*Description*
158 312	Shunt measurement: ±60 mV, ±90 mV, ±150 mV, ±300 mV, ±500 mV, ±10 V [1]
158 320	Voltage measurement: ±400 V, ±600 V, ±800 V, ±1000 V, ±1200 V
158 338	Voltage measurement: ±1400 V, ±1600 V, ±1800 V, ±2000 V, ±2200 V, ±3600 V [2]

[1] Only output ±10 V
[2] Upon request (not switch-selectable)

SINEAX C402

Alarm unit

for unipolar and bipolar DC currents and voltages

These devices are available both in Ex design and non-Ex design.

Customer benefit

- 2 limit value relays with changeover contact
- Effective direction of relays/LED selectable using jumpers
- Limit value setting via potentiometer and test sockets
- Isolates signals for hazardous areas

Technical data

Input:	–0.1…+0.1 mA to –50…+50 mA, –0.06…+0.06 V to –40…+40 V (Ex: max. ±30 V)
Relay outputs:	AC: 250 V, 2 A, 500 VA DC: 250 V, 1 A, max. 30 W
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	120 x 17.5 x 146.5 mm

SINEAX B811

Power supply unit with additional functions

to energise 2-wire transmitters

These devices are available both in Ex design and non-Ex design.

Customer benefit

- HART pass-through
- Current or voltage output for standard signals and non-standard signals
- Suitable for the supply of transmitters in hazardous areas
- Line breakage and short-circuit monitoring via output signal or LED as well as relay

Technical data

Input circuit:	4…20 mA, supply voltage (20 mA): 24 V (non-Ex design), 16 V (Ex design)
Output:	0…5 V, 1…5 V, 0…10 V, 1…10 V or non-standard signals 0…20 mA, 4…20 mA or non-standard signals
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	120 x 17.5 x 146.5 mm

Stock variant

Article No.	*Description*
107 400	Power supply: 85…110 V DC/230 V AC, Ex design [EEx ia] IIC, without HART, without relay

SINEAX B812

Standard power supply unit

to energise 2-wire transmitters

These devices are available both in Ex design and non-Ex design.

Customer benefit
- HART pass-through
- Suitable for the supply of transmitters in hazardous areas
- Line monitoring via LED
- Setting time <0.3 ms

Technical Data

Input circuit:	4…20 mA, supply voltage (20 mA): 18 V
Output:	4…20 mA
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	69.2 x 17.5 x 114 mm (terminals not pluggable) 85 x 17.5 x 114 mm (terminals pluggable)

Stock variants

Article No.	*Description*
155 102	Power supply: 85…110 V DC/230 V AC, Ex design [Ex ia Ga] IIC and [Ex ia Da] IIIC, terminals not pluggable
155 144	Power supply: 85…110 V DC/230 V AC, Ex design [Ex ia Ga] IIC and [Ex ia Da] IIIC, terminals pluggable
155 095	Power supply: 24…60 V AC/DC, Ex design [Ex ia Ga] IIC and [Ex ia Da] IIIC, terminals not pluggable
155 136	Power supply: 24…60 V AC/DC, Ex design [Ex ia Ga] IIC and [Ex ia Da] IIIC, terminals pluggable
155 087	Power supply: 85…230 V AC/DC, non-Ex design, terminals not pluggable
155 128	Power supply: 85…230 V AC/DC, non-Ex design, terminals pluggable
155 079	Power supply: 24…60 V AC/DC, non-Ex design, terminals not pluggable
155 110	Power supply: 24…60 V AC/DC, non-Ex design, terminals pluggable

SINEAX B840

4-channel power supply unit

to energise 2-wire transmitters

Customer benefit
- Cost-effective power supply unit with 4 channels
- Line monitoring
- Galvanic isolation between input circuits and power supply

Technical Data

Input circuit:	Supply voltage 24 V, current limit ≤25mA
Power supply:	24 V AC, 115 V AC, 230 V AC 50/60 Hz
Height x width x depth:	69.1 x 70 x 112.5 mm

Stock variants

Article No.	*Description*
147 464	Power supply 24 V AC
147 472	Power supply 115 V AC
147 480	Power supply 230 V AC

SINEAX VS70

Power supply

Power supply for the CB-Power-Bus

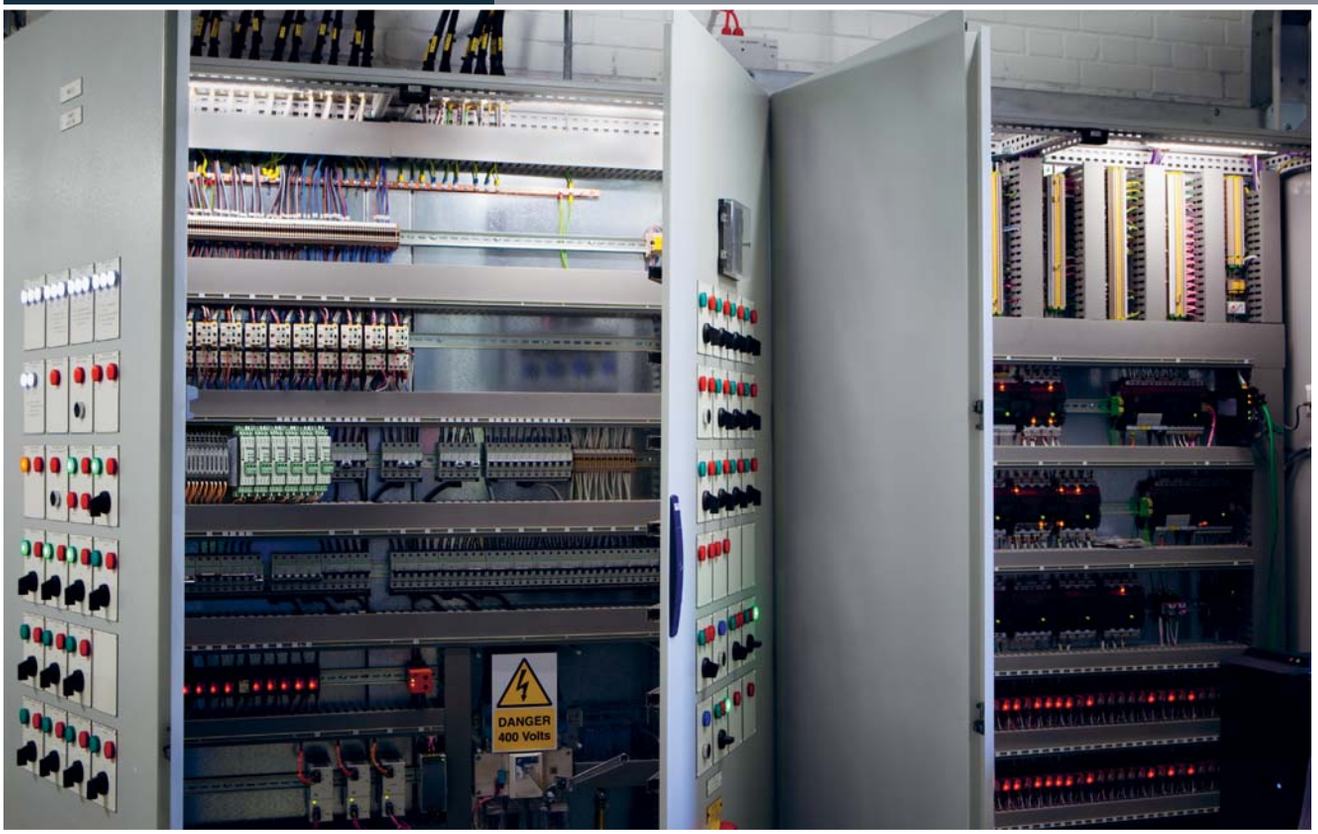
Main features
- Bridging power supply through the DIN rail bus connector (CB-Power-Bus)
- Redundant power supply
- Built-in over-voltage (surge) protection
- Supply of up to 75 modules
- Two individual power supply sources can be connected to one SINEAX VS70 module
- Small dimensions
- Spring cage clamp connection

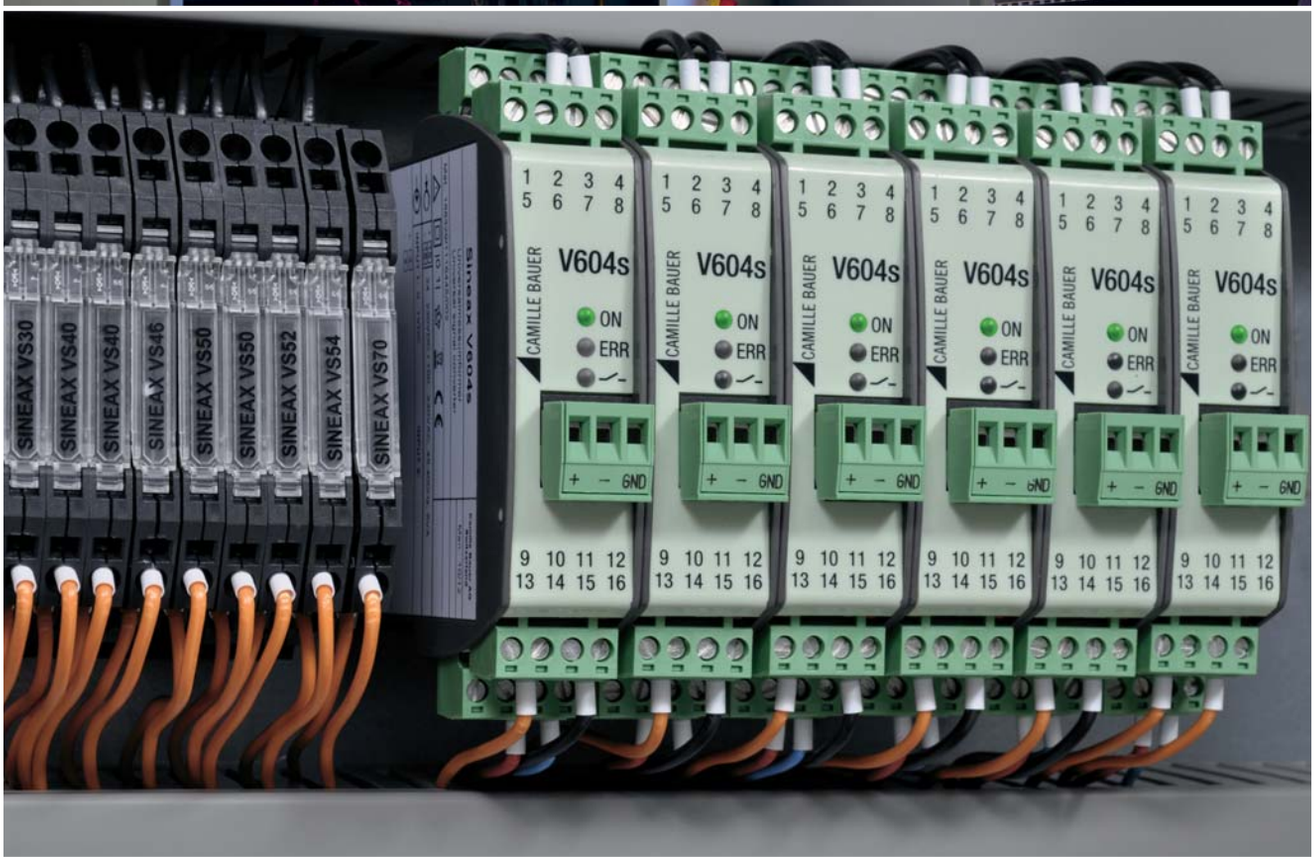
Technical data
Height x width x depth: 93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

Stock variants

Article No.	*Description*
162 818	SINEAX VS70

Compatible with CB-Power-Bus


DANGER
400 Volts


SINEAX VS30
SINEAX VS40
SINEAX VS40
SINEAX VS46
SINEAX VS50
SINEAX VS50
SINEAX VS52
SINEAX VS54
SINEAX VS70
CAMILLE BAUER
V604s
ON
ERR
+ − GND

Multifunctional signal converters

are designed for a wide range of measurements and tasks. These instruments can be freely programmed and adapted to the most varied input and output variables.
This results in many advantages, e.g. optimised stock keeping, intelligent linking and adaptation of signals or safe monitoring and communication of limit values.

Content multifunctional signal converters

SINEAX V624

Programmable temperature transmitter

for thermocouples and resistance thermometers

These devices are available both in Ex design and non-Ex design.

Customer benefit

- Programmable without any power supply connection
- Zero and span calibration via software
- Suitable for temperature measurement in hazardous areas
- Sensor breakage and short-circuit monitoring

Technical data

Input:	Pt100, Ni100 in 2, 3 or 4-wire connection, Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re
Output:	Programmable between 0…20 mA or 20…0 mA or 0…10 V or 10…0 V
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	69.2 x 17.5 x 114 mm (terminals not pluggable) 85 x 17.5 x 114 mm (terminals pluggable)

Stock variants

Article No.	*Description*
141 896	Power supply 24…60 V AC/DC, non-Ex design, terminals not pluggable
141 903	Power supply 85…230 V AC/DC, non-Ex design, terminals not pluggable
143 412	Power supply 24…60 V AC/DC, non-Ex design, terminals pluggable
143 420	Power supply 85…230 V AC/DC, non-Ex design, terminals pluggable
141 911	Power supply 24…60 V AC/DC, Ex design [Ex ia Ga] IIC and [Ex ia Da] IIIC, terminals not pluggable
141 929	Power supply 85…230 V AC/DC, Ex design [Ex ia Ga] IIC and [Ex ia Da] IIIC, terminals not pluggable
143 438	Power supply 24…60 V AC/DC, Ex design [Ex ia Ga] IIC and [Ex ia Da] IIIC, terminals pluggable
143 446	Power supply 85…230 V AC/DC, Ex design [Ex ia Ga] IIC and [Ex ia Da] IIIC, terminals pluggable

Accessories

Configuration software see page 68, PC connecting cable see page 71

SINEAX TV809

Programmable isolation amplifier

for unipolar and bipolar DC currents and voltages

These devices are available both in Ex design and non-Ex design.

Customer benefit

- Current or voltage output in one device
- Safe isolation, enhanced up to 600 V (Cat. II) or 1000 V (Cat. I)
- Limit value relay secures monitoring function
- Intrinsically safe input for signals from hazardous areas

Technical data

Current input:	–1.5…+1.5 mA to –100…+100 mA
Voltage input:	–1.7…+1.7 V to –1000…+1000 V
Current output:	–0.5…+0.5 mA to –20…+20 mA
Voltage output:	–0.5…+0.5 V to –10…+10 V
Relay output:	AC: 250 V, 2 A, 500 VA, DC: 125 V, 2 A, max. 60 W
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	69.2 x 17.5 x 114 mm (terminals not pluggable) 85 x 17.5 x 114 mm (terminals pluggable)

Stock variants

Article No.	*Description*
147 282	Power supply 85…230 V, terminals pluggable, non-Ex design
147 258	Power supply 24…60 V, terminals not pluggable, non-Ex design
147 266	Power supply 85…230 V, terminals not pluggable, non-Ex design

Accessories

Configuration software see page 68, PC connecting cable see page 71

SINEAX V604

Programmable universal transmitter

for thermocouples, resistance thermometers, current, voltage and resistance

These devices are available both in Ex design and non-Ex design.

Customer benefit

- All process variables as well as current and voltage output in one device
- 1 limit value relay offers monitoring function
- Suitable for measurement in hazardous areas
- Sensor breakage monitoring

Technical data

Input:	Pt10…1000, Ni10…1000, Pt20/20, Cu10/25, Cu20/25 in 2, 3 or 4-wire connection Thermocouple type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re –1…+1 mV to –40…+40 V (Ex: max. ±30 V), –40…+40 µA to –50…+100 mA 0…8 Ohm to 0…5 kOhm
Output:	–2.5…+2.5 mA to –22…+22 mA or –2…+2 V to –12…+15 V
Relay output:	AC: 250 V, 2 A, 500 VA; DC: 250 V, 1 A, max. 30 W
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	120 x 17.5 x 146.5 mm

Stock variants SINEAX V604

Article No.	*Description*
973 059	Power supply 24…60 V AC/DC, internal cold junction compensation, non-Ex design
973 083	Power supply 85…230 V AC/DC, internal cold junction compensation, non-Ex design
973 116	Power supply 24…60 V AC/DC, internal cold junction comp., Ex design [EEx ia] IIC
973 140	Power supply 85…110 V DC / 230 V AC, internal cold junction compensation, Ex design [EEx ia] IIC

Accessories

Configuration software see page 68, PC connecting cable see page 71

SINEAX VC603

Programmable combined transmitter/alarm unit

for thermocouples, resistance thermometers, current, voltage and resistance

These devices are available both in Ex design and non-Ex design.

Customer benefit

- All process variables as well as current and voltage output in one device
- 3 limit value relays offer numerous monitoring functions
- Suitable for temperature measurement in hazardous areas
- Sensor breakage monitoring

Technical data

Input:	Pt10…1000, Ni10…1000, Pt20/20, Cu10/25, Cu20/25 in 2, 3 or 4-wire connection Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re –1…+1 mV to –40…+40 V (Ex: max. ±30 V), –40…+40 µA to –50…+100 mA 0…8 Ohm to 0…5 kOhm
Output:	–2.5…+2,5 mA to –22…+22 mA or –2…+2 V to –12…+15 V
Relay outputs:	AC: 250 V, 2 A, 500 VA; DC: 250 V, 1 A, max. 30 W
Power supply:	24…60 V AC/DC or 85…230 V AC/DC
Height x width x depth:	120 x 17.5 x 146,5 mm

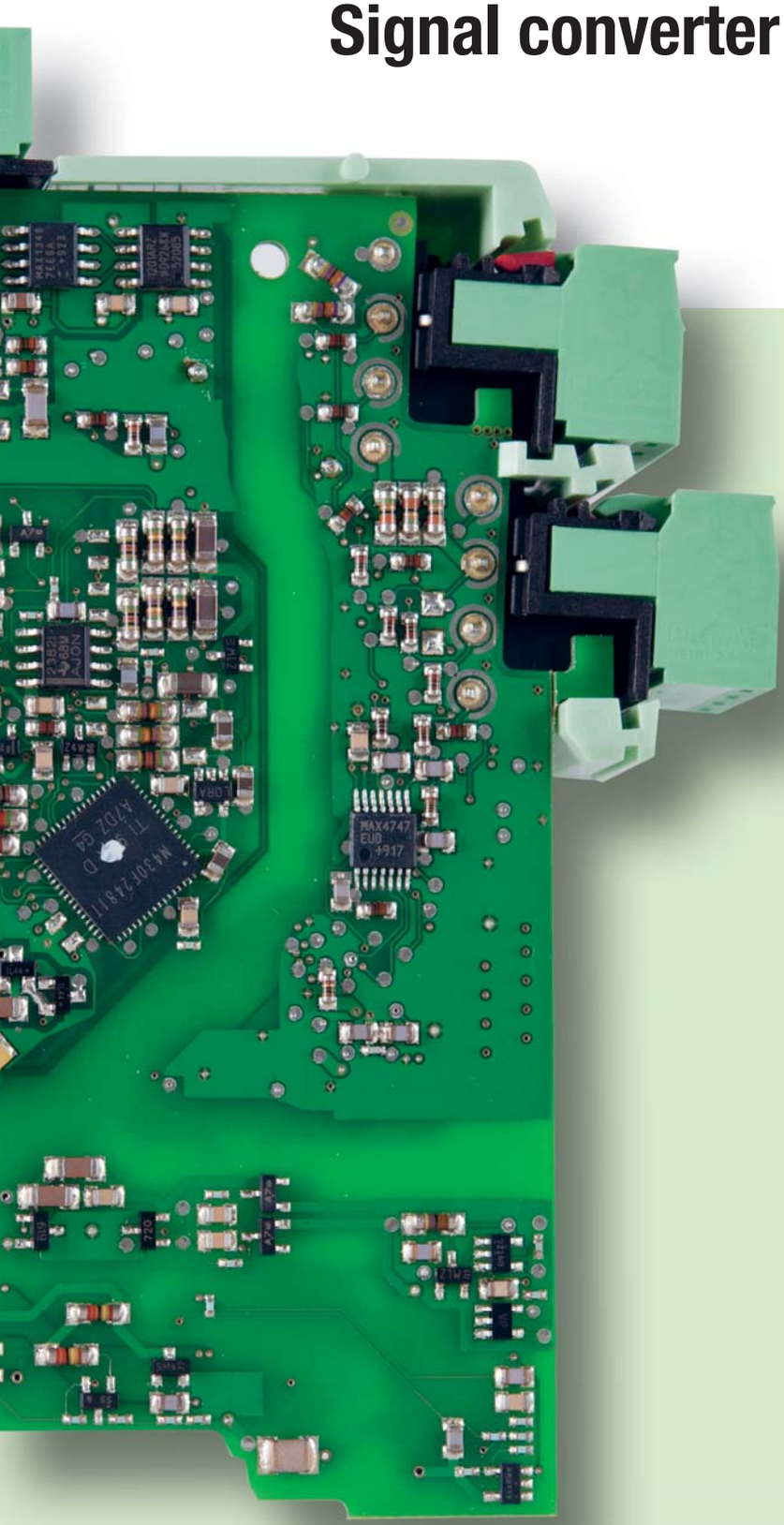
Stock variants SINEAX VC603

Article No.	*Description*
987 670	Power supply 24…60 V AC/DC, internal cold junction compensation, non-Ex design
987 852	Power supply 85…230 V AC/DC, internal cold junction compensation, non-Ex design
987 894	Power supply 24…60 V AC/DC, internal cold junction comp., Ex design [EEx ia] IIC
987 935	Power supply 85…110 V DC / 230 V AC, internal cold junction compensation Ex design [EEx ia] IIC

Accessories

Configuration software see page 68, PC connecting cable see page 71

SINEAX V604s
Signal converter of the premium class



- Multifunctional
- Precise
- Safe

SINEAX V604s is characterised by the following features:

- Sensor connection without any external jumpers
- High-quality pluggable screw terminals or spring cage terminal
- 2 analogue inputs and 2 analogue outputs
- 2 relay outputs *
- Digital output (S0) *
- Digital MODBUS/RTU interface for parameterising and system integration
- Integrated mathematical functions
- Functions for safety-aligned measurements
- Integrated DC energy meter *
- Customised linearisation
- Numerous limit value monitoring and alarms
- AC/DC wide-range power supply unit

SINEAX V604s is a high-performance multifunctional signal converter with a very high basic accuracy of 0.1 %.

However, SINEAX V604s is more than a simple isolation amplifier or temperature transmitter.

The instrument may be adapted to the most varied measuring tasks via the MODBUS/RTU interface integrated as a standard and the CB-Manager software available free-of-charge.

This multifunctionality in combination with very easy operation results in a wide range of applications of classical tasks, e.g. temperature measurement or signal isolation through to intelligent monitoring tasks aligned to safety.

* Depending on the type of instrument

Overview of instrument versions

	The universal instrument	The bidirectional instrument	The monitoring instrument	The fast instrument
	V604s	**VB604s**	**VC604s**	**VQ604s**
				
2 universal inputs (mA, mV, Ω, temperature)	•	•	•	•
Galvanic isolation of all circuits	•	•	•	•
AC/DC wide-range power supply unit (24…230V)	•	•	•	•
Fast measurement up to 10 ms	-	-	-	•
Number of analogue outputs (mA, V)	2	2	1	2
Relay outputs/digital output	1 normally open (No) or digital output	1 normally open (No)	2 change over	1 normally open (No)
Remote I/O functionality	-	•	-	-
Design for 600 V input -600…+600 VDC at one output	•	-	-	-
High-quality pluggable screw terminals or spring cage terminal	•	•	•	•
Output signal (selectable for each output separately)	U or I	U or I	U or I	I
Mathematical linking of inputs	•	•	•	•
DC-Energy meter	•	•	-	-
Sensor drift monitoring	•	•	•	•
Breakage and short circuit monitoring	•	•	•	•
Sensor redundancy	•	•	•	•
MODBUS interface	•	•	•	•

SINEAX V604s

Programmable multifunctional transmitter

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

Main features

SINEAX V604s is a multifunctional transmitter for top-hat rail assembly with the following main characteristics:

- Measurement of DC voltage, DC current, temperature (RTD, TC) and resistance
- System capability: Parameterising and readout of all input variables and internally calculated values via MODBUS
- Sensor connection without any external jumpers
- 2 inputs (e.g. for sensor redundancy or difference formation)
- 2 outputs (U and / or I)
- DC- energy meter - function (with S0 output)
- 2 inputs can be linked with each other and allocated to the 2 outputs which enables calculations and sensor monitoring (e.g. prognostic maintenance of sensors)
- Freely programmable relay, e.g. for limit or alarm signalling
- Digital output (optional)
- AC/DC wide-range power supply unit
- Pluggable high-quality screw or spring cage terminals

All settings of the instrument can be adapted to the measuring task by PC software. The software also serves visualising, commissioning and service.

Technical data

Input 1 and 2:	Pt100, adjustable Pt20…Pt1000 Ni100, adjustable Ni50…Ni1000 2, 3 or 4 wire connection Thermocouple types B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re –1000…+1000 mV, unipolar/bipolar –600…+600 V, unipolar/bipolar –50…+50 mA, unipolar/bipolar 0…5 kOhm, 2 or 3 wire connection
Output 1 and 2:	±20 mA, uni/bipolar, range adjustable or ±10 V, uni/bipolar, range adjustable
Relay output:	1 normaly open: AC: 2 A / 250 VAC DC: 2 A / 30 VAC
Power supply:	24 …230 V DC, 100…230 V AC, ±15%
Height x width x depth:	118 x 22.5 x 108 mm (incl. top-hat rail)

Stock variants

Article No.	*Description*
168 329	Device versions for high DC voltages: DC voltages of up to 600VDC can be measured at one input. In addition, mV, RTD, TC and resistance measurements are possible at both inputs. At one input mA. The device is supplied with screw terminals and a limit value relay. The following configuration is preset: Input 1: 0…1000 mV / Input 2: not used Output 1: 4…20 mA / Output 2: not used
169 624	Device version without a high DC input: Contrary to the version for high voltages, mA signals can be processed simultaneously at both inputs of this device version. In addition, mV, RTD, TC and resistance measurements are possible. The device is supplied with screw terminals and a limit value relay. The following configuration is preset: Input 1: 4…20 mA / Input 2: 4…20 mA Output 1: 4…20 mA / Output 2: 4…20 mA

Accessories

Configuration software see page 68, PC converter see page 71

SINEAX VB604s

Programmable multifunctional transmitter with REMOTE I/O functionality

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

Main features

SINEAX VB604s is a multifunctional transmitter for top-hat rail assembly with the following main characteristics:

- Measurement of DC voltage, DC current, temperature (RTD, TC) and resistance
- ***Programmable remote I/O functionality.*** Readout of all input variables and internally calculated values via MODBUS. ***Simultaneously, the outputs and the relay may be controlled via MODBUS.***
- ***Free selection as to whether the output variables are dependent on the input variables or whether the outputs are controlled independently of the inputs via MODBUS.***
- Sensor connection without any external jumpers
- 2 inputs (e.g. for sensor redundancy or difference formation)
- 2 outputs (U and/or I)
- 2 inputs can be linked with each other and allocated to the 2 outputs which enables calculations and sensor monitoring (e.g. prognostic maintenance of sensors)
- System capability: Communication via Modbus interface
- Freely programmable relay, e.g. for limit or alarm signalling
- AC/DC wide-range power supply unit
- Pluggable high-quality screw or spring cage terminal

All settings of the instrument can be adapted to the measuring task by PC software. The software also serves visualising, commissioning and service

Technical data

Input 1 and 2:	Pt100, adjustable Pt20…Pt1000	
	Ni100, adjustable Ni50…Ni1000	
	2, 3 or 4 wire connection	
	Thermocouple types B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re	
	–1000…+1000 mV, unipolar/bipolar	
	–50…+50 mA, unipolar/bipolar	
	0…5 kOhm, 2 or 3 wire connection	
Output 1 and 2:	±20 mA, uni/bipolar, range adjustable or	
	±10 V, uni/bipolar, range adjustable	
Relay output:	1 normaly open:	AC: 2 A / 250 VAC
		DC: 2 A / 30 VAC
Power supply:	24…230 V DC, 100…230 V AC, ±15%	
Height x width x depth:	118 x 22.5 x 108 mm (incl. top-hat rail)	

Accessories

Configuration software see page 68, PC converter see page 71

SINEAX VC604s

Programmable safety value converter

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

Main features

SINEAX VC604s is a multifunctional transmitter for top-hat rail assembly with the following main characteristics:

- Measurement of DC voltage, DC current, temperature (RTD, TC) and resistance
- System capability: Parameterising and readout of all input variables and internally calculated values via MODBUS
- Sensor connection without any external jumpers
- 2 inputs (e.g. for sensor redundancy or difference formation)
- 1 output (U or I)
- 2 inputs can be linked with each other and allocated to the 2 outputs which enables calculations and sensor monitoring (e.g. prognostic maintenance of sensors)
- ***2 freely programmable relays with changeover contacts, e.g. for limit or alarm signalling***
- AC/DC wide-range power supply unit
- Pluggable high-quality screw or spring cage terminals

All settings of the instrument can be adapted to the measuring task by PC software. The software also serves visualising, commissioning and service.

Technical data

Input 1 and 2:	Pt100, adjustable Pt20…Pt1000 Ni100, adjustable Ni50…Ni1000 2, 3 or 4 wire connection Thermocouple types B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re –1000…+1000 mV, unipolar/bipolar –50…+50 mA, unipolar/bipolar 0…5 kOhm, 2 or 3 wire connection
Output 1 and 2:	±20 mA, uni/bipolar, range adjustable or ±10 V, uni/bipolar, range adjustable
Relay output:	2 change over AC: 2 A / 250 VAC DC: 2 A / 30 VAC
Power supply:	24 …230 V DC, 100…230 V AC, ±15%
Height x width x depth:	118 x 22.5 x 108 mm (incl. top-hat rail)

Accessories

Configuration software see page 68, PC converter see page 71

SINEAX VQ604s

Programmable multifunctional transmitter with very fast setting times

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

Main features

SINEAX VQ604s is a multifunctional transmitter for top-hat rail assembly with the following main characteristics:

- Fast measurement of DC voltage, DC current, temperature (RTD, TC) and resistance
- System capability: Parameterising and readout of all input variables and internally calculated values via MODBUS
- ***Setting time up to 10 ms***
- Sensor connection without any external jumpers
- 2 inputs (e.g. for sensor redundancy or difference formation)
- 2 outputs (I)
- 2 inputs can be linked with each other and allocated to the 2 outputs which enables calculations and sensor monitoring (e.g. prognostic maintenance of sensors).
- Freely programmable relay, e.g. for limit or alarm signalling
- AC/DC wide-range power supply unit
- Pluggable high-quality screw or spring cage terminals

All settings of the instrument can be adapted to the measuring task by PC software. The software also serves visualising, commissioning and service.

Technical data

Input 1 and 2:	Pt100, adjustable Pt20…Pt1000
	Ni100, adjustable Ni50…Ni1000
	2, 3 or 4 wire connection
	Thermocouple types B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re
	–1000…+1000 mV, unipolar/bipolar
	–50…+50 mA, unipolar/bipolar
	0…5 kOhm, 2 or 3 wire connection
Output 1 and 2:	±20 mA, uni/bipolar, range adjustable or
	±10 V, uni/bipolar, range adjustable
Relay output:	1 normaly open: AC: 2 A / 250 VAC
	DC: 2 A / 30 VAC
Power supply:	24…230 V DC, 100…230 V AC, ±15%
Height x width x depth:	118 x 22.5 x 108 mm (incl. top-hat rail)

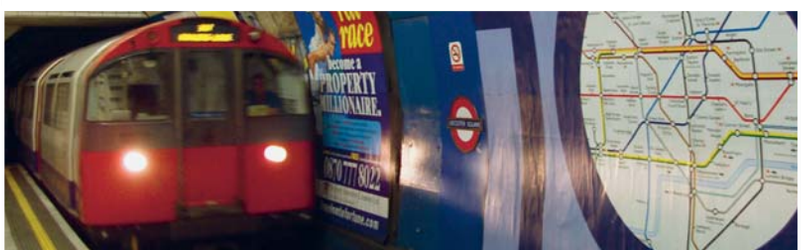
Accessories

Configuration software see page 68, PC converter see page 71

Process management

Process management systems assume the visualisation, recording and management of process data. These systems have intelligent control functions and form the interface of analogue signals as well as bus systems to the next higher-ranking control level.

Content process management



Overview videographic recorders

					
Features	**LINAX A303**	**LINAX A305**	**LINAX A315**	**LINAX A325**	**LINAX A330**
Display	120 mm (4,7 Zoll) LCD	144 mm (5,7 Zoll) TFT;	144 mm (5,7 Zoll) TFT	178 mm (7 Zoll) TFT	310 mm (12,1 Zoll) TFT
Front panel and depth	144 x 144 x 171 mm	144 x 144 x 50 mm	144 x 144 x 158 mm	190 x 144 x 158 mm	288 x 288 x 195 mm
Universal analog inputs	3 resp. 6	1 - 7 (8 via Modbus)	0, 4, 8, 12	4, 8, 12, 16 resp. 20 (40 via Modbus or Profibus)*	6, 12, 18, 24, 30 resp. 36
Memory internal/external	2 MB / CF card	8 MB / SD card	128 MB / SD card or USB stick	256 MB / SD card or USB stick	8 MB / CF card
Transmitter power supply	24 V / 250 mA	2 x 24 V / 22 mA	24 V / 250 mA	24 V / 200 mA	5 x 24 V / 45 mA
Digital inputs	3	via analog inputs	3	6 resp. 14	6, 12, 18 resp. 24
Limit values / Relays	14 / 4	32 / 3	30 / 6	100 / 6 bzw. 12	144/6, 12, 18 bzw. 24
Interfaces	USB, RS232 / RS485, Ethernet TCP/IP, Webserver	Ethernet: TCP/IP, HTTP, FTP (Server), Modbus TCP (Slave/Master), Webserver, E-Mail	Ethernet, RS232/485, Modbus TCP (Slave), Modbus RTU (Slave) Webserver	USB, RS232 / RS485, Profibus DP, Modbus TCP (Slave), Modbus RTU (Slave/Master) Ethernet, Webserver, E-Mail	Ethernet: TCP/IP, HTTP, FTP (Server), Modbus TCP (Slave/Master), Webserver, E-Mail, RS 485: Modbus RTU (Slave/Master)
Additional functions	Mathematic	Mathematic	Mathematic / waste water	Mathematic / waste water / telealarm / batch	Mathematic / batch
Process groups	1	2	4	10	6
Supply voltage	90 VAC to 250 VAC 24 VDC	85 VAC to 265 VAC 10 VDC to 36 VDC	100 VAC to 230 VAC 24 V AC/DC	100 VAC bis 230 VAC 24 V AC/DC	90 VAC to 265 VAC
FDA 21 CFR PART 11	no	standard	No	standard	standard
Protection	IP54 (front)	IP66 / NEMA4X	IP65 (Front)	IP65 (front)	IP66 / NEMA4X (front)

* The LINAX A325 is able to display 16 digital and 8 mathematic channels additional to the respectively 40 inputs

LINAX A305

Videographic recorder in field housing

for control cabinet, wall or pipe installation

Customer benefit

- Ultracompact recorder – installation depth only 50 mm
- Very distinct, high-quality TFT display
- Device can be equipped and extended according to customer requirements
- For applications in rough environment due to IP66 / NEMA4X device protection (front)
- Data security in accordance with FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

Technical data

Number of channels:	8 (up to 7 universal inputs)
Display:	14.4 cm (5.7 inch) TFT colour
Operation:	6 buttons
Memory:	8 MB internally, up to 1 GB externally (SD card)
Communication:	TCP/IP, HTTP, SMTP, FTP (server), Modbus TCP (master/slave) integrated web-server, E-mail function
Transmitter power supply:	Up to 2 loops
Process alarms:	32
Additional functions:	16 totalisers, mathematic and logic functions
Height x width x depth:	144 x 144 x 50 mm

LINAX A310

Videographic recorder with basic functions

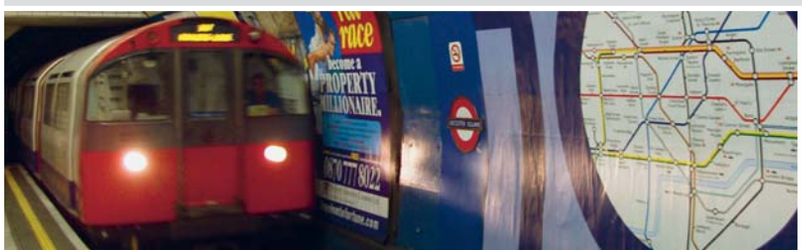
for control cabinet, wall or pipe installation

Customer benefit

- Ultracompact recorder – installation depth only 50 mm
- Very distinct, high-quality TFT display
- Device can be equipped and extended according to customer requirements
- For applications in rough environment due to IP66 / NEMA4X device protection (front)
- Data security in accordance with FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

Technical data

Number of channels:	8 (up to 4 universal inputs)
Display:	14.4 cm (5.7 inch) TFT colour or 12 cm (4.7 inch) monochrome
Operation:	6 buttons
Memory:	8 MB internally, up to 1 GB externally
Communication:	TCP/IP, HTTP, SMTP, FTP (server), Modbus TCP (master/slave) integrated web-server, E-mail function
Transmitter power supply:	Up to 2 loops
Process alarms:	32
Additional functions:	16 totalisers, mathematic and logic functions
Height x width x depth:	144 x 144 x 50 mm



LINAX A315

Videographic recorder with extended basic functions

for control cabinet installation

Main features

- Inexpensive videographic recorder for basic applications
- Very distinct, high-quality TFT display
- Device can be equipped and extended according to customer requirements
- Device protection IP65 (Front)
- Fast scanning of 100ms/channel
- Low operating costs (TCO)

Technical data

Numberof channels:	0, 4, 8 or 12
Display:	14,5 cm (5,7 inch) TFT colour
Operation:	Via turn/push wheel
Memory:	128 MB internally / SD card externally
Communication:	USB, Ethernet RJ45, RS232/485 (optional), Modbus RTU/TSP slave (optional), integrated web-server
Transmitter power supply:	24 V / 250 mA
Process alarms:	30
Additional functions:	Mathematic functions
Height x width x depth:	144 x 144 x 171 mm

LINAX A325

High-performance videographic recorder

for control cabinet installation

Customer benefit

- Powerful videographic recorder with high performance
- Simple intuitive operation, with built-in Help
- Device can be equipped and extended according to customer requirements
- For applications in rough environment due to IP65 / NEMA4 device protection (front)
- Data security in accordance with FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

Technical data

Numberof channels:	4, 8, 12, 16 bzw. 20 universal inputs (40 via Modbus oder Profibus)
Display:	17.8 cm (7 inch) TFT
Operation:	4 function buttons and Joy-/Shuttle or via USB keyboard
Memory:	256 MB intern, up to 1 GB externally (SD Card or USB stick)
Communication:	TCP/IP, HTTP, FTP (Server), Modbus RTU (Slave) integrated web-server, E-mail function
Transmitter power supply:	24 V / 200 mA
Process alarms:	100
Additional functions:	Mathematic function, additional functions for wastewater, telealarm and charge
Height x width x depth:	190 x 144 x 158 mm

LINAX A330

Videographic recorder with large screen

for control cabinet installation

Customer benefit

- Videographic recorder of high performance and quality with a large screen
- Simple intuitive operation based on Windows
- Device can be equipped and extended according to customer requirements
- For applications in rough environment due to IP66 / NEMA4X device protection (front)
- Data security in accordance with FDA 21 CFR Part FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

Technical data

Number of channels:	Up to 36 universal inputs
Display:	31 cm (12.1 inch) TFT
Operation:	8 buttons
Memory:	8 MB internally, up to 1 GB externally (CF card)
Communication:	TCP/IP, HTTP, FTP (server), Modbus RTU (master/slave) integrated web-server, E-mail function
Transmitter power supply:	Up to 12 loops
Process alarms:	144
Additional functions:	144 totalisers, mathematic and logic functions
Height x width x depth:	288 x 288 x 195 mm

Overview controllers and control systems







Series	Compact controllers			Control systems			
Designation (type) Replacement for GTR	R2500	R2700	R2900	R6000	VR660 / A200R	Soft-controller	OEM
Dimensions (mm) Height	48	96	96	160	85 / 96	—	□
Width	48	48	96	110	23 / 96	—	□
Depth	118	109	50/70	50	114 / 46	—	□
Control panel mounting	●	●	●		— / ●	—	●
Top-hat rail			■	●	● / —	—	●
Channels	1	1	1	4/8	1-32	>1	□
2-step controller	●	●	○	●	●	●	●
3-step controller	●	●	○	●	●	●	●
Continuos-action controller	○	○	○	○	—	●	●
Step-action controller	●	●	○	●	—	●	●
Hot runner controller	●	●	—	●	—	●	●
Differential/slave controller	—	●	○	●	—	●	●
Cascade controller	—	●	—	●	—	●	●
Program controller	●	●	—	—	—	—	●
Input							
Thermocouple	○	○	○	○	●	●	●
Pt 100	○	○	○	○	●	●	●
Linear	○	○	○	○	●	●	●
Output							
Relay	●	●	○	—	—	●	●
Transistor	●	●	○	●	●	●	●
Alarms	●	●	2	●	●	●	●
Self-tuning	●	●	●	●	●	●	●
Proxy setpoint	●	●	●	●	●	●	●
Heating current monitoring	○	●	●	●	●	●	●
Software							
Software Config Tools	●	●	—	●	— / —	—	□
Software Remote Tools	—	○	—	○	— / —	—	□
CB-Manager	—	—	—	—	● / ●	—	—
Auxiliary power	85 to 265		110 to 230	—	24 to 230	—	□
Auxiliary power VAC							
Auxiliary power VDC	24		—	24	24 to 230	—	□
Special features							
Heating circuit monitoring	●	●	●	●	●	●	●
Ramp function	●	●	●	●	●	●	●
Data logger	●	●	—	●	via Software	—	●
Alarm history	●	●	—	●	—	—	●
Mapping	—	—	—	●	—	—	●
Booster circuit	●	●	—	●	—	●	●
Infrared front interface	●	●	—	—	—	—	—
RS232	—	—	○	●	— / ●	—	□
RS485	○	○	○	○	● / —	—	□
Profibus DP	—	○	—	○	—	—	□
CAN/CANopen	—	—	—	○	—	—	□
MODBUS	○	○	—	○	●	—	□
ETHERNET / TCP IP	—	—	—	○	—	—	□
MPI	—	—	—	via CPU	—	—	□
PROFINET	—	—	—	via CPU	—	—	□

● = Default ○ = Order option ■ = Variant A1…A6, D0, F0 □ = in accordance with customer specification

R2500/R2700

Compact controller, limiter and programmer

for switchboard installation

Customer benefit

- Cost-effective controller and limiter with extensive functionalities
- Structured operating and programming procedure
- Applications in rough environment due to IP67
- Standard infrared front interface for fast and convenient commissioning and readout of the data logger or the alarm history
- Suitable for precise control tasks without overshooting
- Sampling cycle 100 ms with integrated transformation to suppress 50/60 Hz
- Hot-runner control and water cooling

Technical data

Height x width x depth:	48 x 48 x 119 mm (R2500), 96 x 48 x 129 mm (R2700)
Measuring inputs:	Thermocouple, Pt100, Ni100, DC or DC voltage
Outputs:	Relay, transistor, continuous, alarm
Power supply:	20…30 V DC, 85…265 V AC

Stock variants

Article No.	*Description*
R2500-V001	Power supply: 85…230 V AC, measuring input temperature, 2 transistor outputs
R2500-V002	Power supply: 85…230 V AC, measuring input temperature, 1 output each for relay, transistor, continuous
R2700-V001	Power supply: 85…230 V AC, measuring input temperature, 2 transistor outputs
R2700-V002	Power supply: 85…230 V AC, measuring input temperature, 2 relay and transistor outputs
R2700-V003	Power supply: 85…230 V AC, measuring input temperature, 1 continuous and 2 transistor outputs
R2700-V004	Power supply: 85…230 V AC, measuring input temperature, 1 continuous, 2 relay and transistor outputs

Accessories

Softwaretool CompactConfig see page 70
Remote maintenance, remote diagnostics and commissioning tool CompactRemote see page 70

R2900

Compact controller

for switchboard installation

Customer's benefit

- Excellent controller with extensive functionalities
- Structured using and programming scheme
- Suitability for precise and without overshooting controller functions
- Digital displays for actual value, as well as setpoint / manipulating factor / heating current
- Version as two-step, three-step, step-action, continuous action, differential and follow-up controller
- Many monitoring functions

Technical data

Measuring inputs:	Thermocouple, Pt 100 (2/3-wire) or standard signal 0/2 … 10 V and 0/4 … 20 mA
Outputs:	Relay, transistor, standard signal, limit contacts
Power supply:	95...253 V AC; 48…62 Hz
Height x width x depth:	96 x 96 x 50 mm

SINEAX VR660 / A200R

Modular temperature control system

for individual optimum solutions

Customer benefit
- Autarkic, simply extendable control components
- Ergonomic / event-oriented onsite visualising
- Onsite operation
- Comprehensive operating concept (from 1-channel to multichannel control system)
- Precise PDPI control algorithm without overshooting
- Complete pertaining sensorics program
- Cost-effective overall system

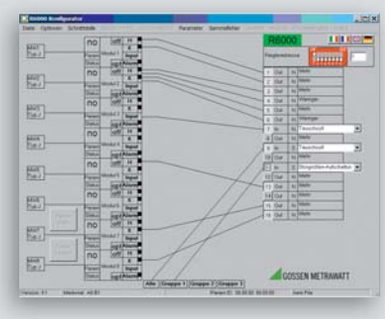
Technical data

Measuring inputs:	Thermocouples, Pt100 (also Pt50…..1000), Ni100 (also Ni50…1000), voltage (–1…1V)
Outputs:	4 digital outputs (for SSR relays or PLC inputs) Heating – Cooling – Alarm 1 – Alarm 2
Power supply:	24…230 V DC/AC, 45…400 Hz
Controller behaviour:	2-point PDPI controller (heating or cooling) 3-point PDPI controller (heating or cooling)
Accuracy:	≥ ±0.5 K
Interface:	RS 485
Height x width x depth:	85 x 23 x 114 mm (top-hat rail controller) 96 x 96 x 46 mm (operating and display unit)

R6000

8-channel control module

R6Konfig



for top-hat rail installation

Customer benefit
- Control channels freely configurable as well as any allocation of the outputs
- Structured operating and programming procedure
- R6Konfig software tool free of charge
- Universal bus connections; Profibus-DP, CAN-Bus, Modbus (RS-485)
- Suitable for precise control tasks without overshooting
- Sampling cycle 10 ms per channel, 100 ms per device with integrated transformation to suppress 50/60 Hz
- Hot-runner control and water cooling
- Data logger and alarm history to prepare an error analysis
- Power limitation; limitation of power consumption, energy optimising

Technical data

Measuring inputs:	Thermocouple, Pt100, Ni100, 0/4…20 mA
Output:	Binary I/Os, continuous
Power supply:	24 V DC (18…30 V DC)
Height x width x depth:	182 x 109 x 78 mm

Stock variants

Article No.	*Description*
R6000-V001	Power supply: 24 V DC, measuring input temperature, 16 binary I/Os, Profibus-DP
R6000-V002	Power supply: 24 V DC, measuring input temp., 16 binary I/Os, Modbus RS 485
R6000-V003	Power supply: 24 V DC, measuring input temperature, 16 binary I/Os, CAN-Bus

Accessories

Software tool R6Konfig see page 70

PDPI SOFTcontroller

in CoDeSys and PC Worx (Phoenix Contact) programming languages

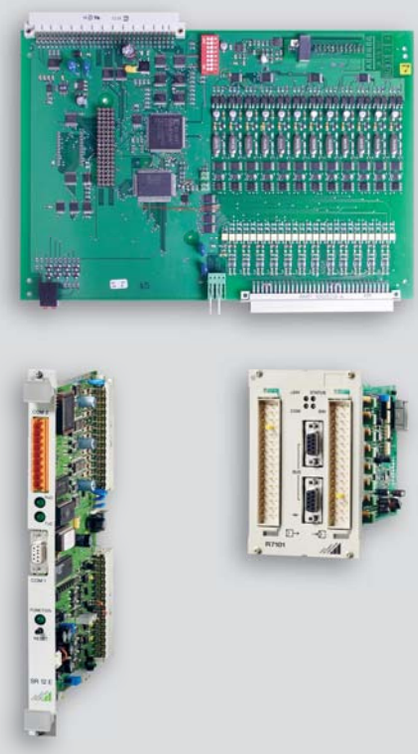
Customer benefit

- Simple integration into all control systems
- Suitable for precise control tasks without overshooting
- Sampling cycle 1 ms depending on control
- Any extension of the control channels within CPU, IPC or panel
- Large range of functions with options for extensions as required
- Price advantage through licence acquisition

Technical data

Basic function component in CoDeSys
Professional function component in CoDeSys
Basic function component in PC Worx
Professional function component in PC Worx

OEM control systems



for Customer Applications

Operation and Display

- As desired, ideally matched to the application

Interconnection to the Controller

- Matched to existing hardware, software and communications equipment (Siemens, B&R, Beckhoff etc.)

Control Performance

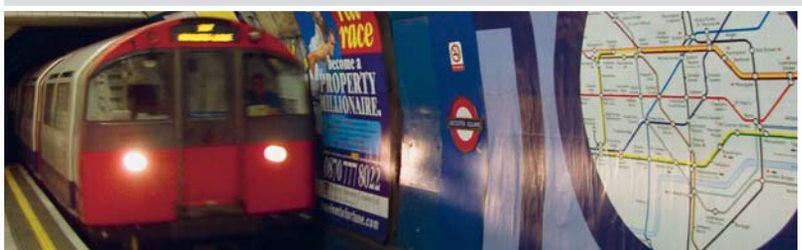
- Controllable according to individual needs, matched to the application
- Dynamics, adaptation, links upon request
- Special and/or patented company know-how can be integrated
- Expandable functionality (even after installation)

Process Variable Inputs

- Optimized number matched to the application, mechanical limitations
- Adaptation of non-standardized sensor types as well
- Integrated process variable monitoring
- Process variable can be manipulated via interface or bus

Controlled Variable Outputs

- Optimized number matched to the application, mechanical limitations
- Special, non-standardized outputs as well
- Controlled variable can be manipulated via interface or bus
- Actuators and actuator monitoring can be integrated



Instrument software

The instrument software facilitates the easy and convenient operation and setting of our instruments. Furthermore, it extends the instrument functions by many additional features, for example, recording of data, the simulation of outputs or the offline configuration of the instruments.

Content software and accessories

Configuration software

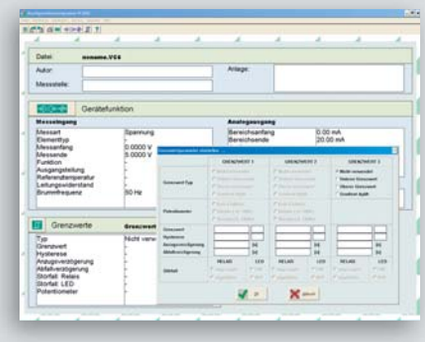
to parameterise programmable Camille Bauer devices

The CD contains the following PC software:

VC600, V600*plus*
- Accessing the configuration stored in the transmitter and printing it as a protocol
- Fetching and visualising the allocation of electrical terminals (for measured variable, output signal, contact output and power supply)
- Simulating measured value, underflow, overflow and sensor breakage and checking the corresponding behaviour of the output signal
- Adjusting zero point and span
- Representing the current measured value on the screen

V600*plus,* additional features
- Visualising, storing and printing of measured values
- Activating password protection

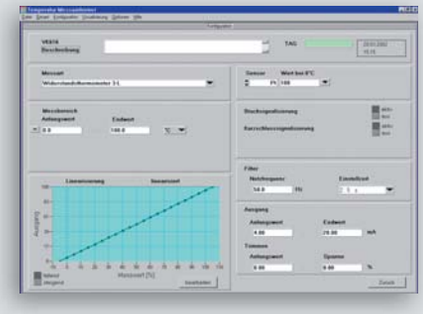
TV800*plus*
- Measuring input (current, voltage, measuring range), measuring output (current, voltage, output area) and relay functions are PC-programmable
- Input filter programmable
- Scalable transmission behaviour, also with signal reversal
- Option of linearising the input signal
- Online access of measured values and output activation possible via PC
- Limit value setting of the relay (option)

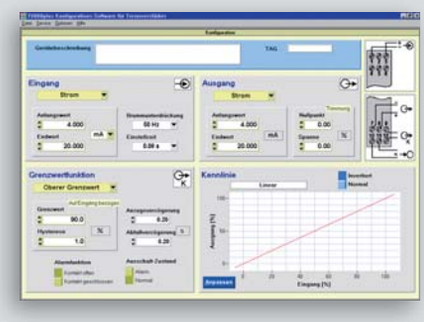


The CD contains further PC software for angular position and heavy current instrumentation.

Content of the CD

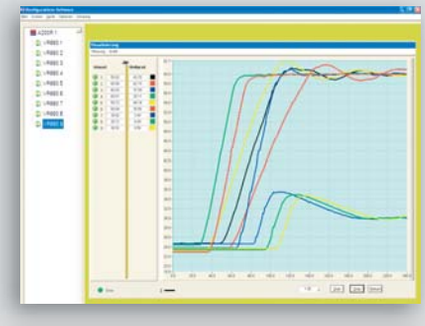
Software	*For devices*	*Language*	*Operating system*
V600plus	SINEAX VK616, VK626, V608, V624, V611, SIRAX V606	D, E, F, N, I, S	9x, NT4.x, 2000, ME, XP
VC600	SINEAX/EURAX V604, VC603, SIRAX V644	D, E, F, N	9x, NT4.x, 2000, ME, XP
TV800plus	SINEAX TV809	D, E, F, N	9x, NT4.x, 2000, ME, XP
DME 4	SINEAX/EURAX DME4xx	D, E, F, N, I	9x, NT4.x, 2000, ME, XP
M560	SINEAX M561, M562, M563	D, N, F, N, S	9x, NT4.x, 2000, ME, XP
2W2	KINAX 2W2, WT711, WT717 and SR719	D, E, F, N	9x, NT4.x, 2000, ME, XP
A200plus	SINEAX A210, A220, A230, A230s with EMMOD 201 or EMMOD 203	D, E, F, N	9x, NT4.x, 2000, ME, XP
A200plus handheld	A210-HH, A230-HH	D, E, F, N	9x, NT4.x, 2000, ME, XP

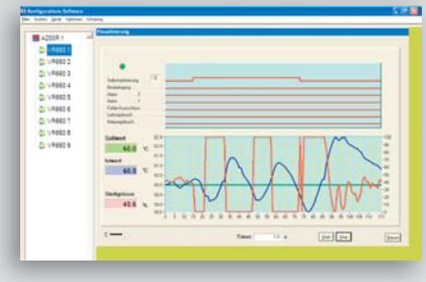




Article No.	*Description*
146 557	Configuration software (CD)

Configuration software CB-Manager





for the modular SINEAX VR660 / A200R control system and for the programmable multifunctional transmitter SINEAX V604s

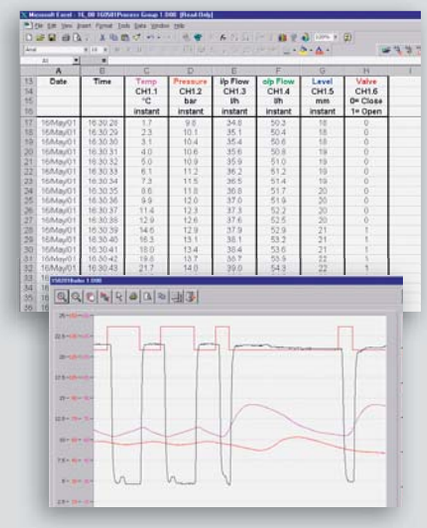
The software permits
- Storing of configuration files in devices
- Reading of device configuration
- Archiving of configuration files for individual devices or the entire bus system
- Visualising of measured values
- User-friendly commissioning
- Pre-engineering of a system without the connection of devices
- Service functions

The software may also be used for the follow devices:
- SINEAX VR660 / A200R
- SINEAX V604s
- SINEAX CAM
- A*PLUS*

Article No.	*Description*
156 027	Configuration software CB-Manager (CD)

This CD is part of the scope of delivery of SINEAX VR660, SINEAX V604s (SINEAX CAM and A*PLUS*).

Data Manager software / Data-Analyzer software



Review software for the videographic recorders of the A300 family

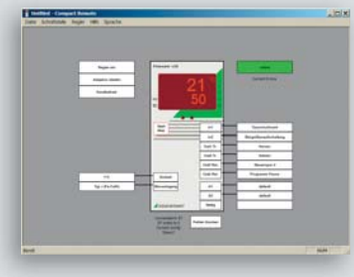
- Archiving, visualising and analysing of process data:
  Data is easily imported into the Data Manager from the LINAX recorder
- Data security from the process to the PC: Consistent continuation of the data security concept of the LINAX series complying with FDA 21 CFR Part 11
- Automatic validation of archived data on basis of coded digital signatures:
  Clear display of the integrity of data files
- Graphic representation of process data:
  Horizontal trend display including analysis aids
- Automatic import of archived data:
  Automatic tabulation of data and event protocols

Article No.	*Description*
155 748	Software and documentation CD for LINAX

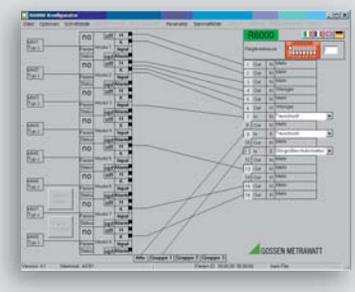
Specification tools

CompactConfig

CompactRemote



R6Konfig



CompactConfig
(German, English, French, Italian)
for R2500 and R2700

- Software for online and offline device and parameters configuration
- Automatic generation of a wiring diagram
- Online viewing of the control process
- Read-out and storage of values from the data logger and from alarm history
- Administration of parameter sets
- Graphic setup of the program controller

Remote tool for initial start-up, service and remote maintenance

CompactRemote
(German, English)
for R2700 with Profibus-DP
CompactConfig can access the controller via Ethernet TCP/IP, Profibus-DP or MPI.

- Software for online and offline device and parameters configuration
- Automatic generation of a wiring diagram
- Online viewing of the control process
- Read-out and storage of values from the data logger and from alarm history
- Administration of parameter sets

R6Konfig
(German, English, French, Italian)
for R6000

- Software for online and offline device and parameters configuration
- Storage and expression of the parameter and configuration values
- Online viewing of the control process
- Read-out and storage of values from the data logger and from alarm history
- Administration of parameter sets
- Importing and exporting a prepared parameter sets in the format of a S7 data blocks (WLD file) in the SIMATIC manager

137 887
147 787
147 779

980 179

141 416

988 058

141 440

143 587

Z250I

Z270I

163 189

162 917

Programming and additional cables

serve programming of transmitters on a PC if the respective software is available

Customer benefit
- Programming is possible at the transmitter with or without a power supply connection
- Programming of transmitters in standard and Ex design

Article No.	*Description*	*VK616 V611*	*V608 V624 V606*	*VC603 V604 V644*	*TV809 (NEx)*	*TV809 (EX)*	*A200R*
137 887	Programming cable PK610 (Ex)	•	•				
147 787	Programming cable PRKAB 600 (Ex)			•		•	
147 779	Programming cable PRKAB 560 (NEx)				•		
980 179	Extension cable SUB D 9pol. male/female						•
141 440	Additional cable	•					
141 416	Additional cable		•				
988 058	Additional cable			•			
143 587	Additional cable				•	•	

USB 2500 / USB 2700

IR/USB Adapter fort he controller R2500 and R2700. To use the configuration tool CompactConfig you require either the IR adapter IR/USB 2500 (Z250i) for R2500 or IR/USB 2700 (Z270i) for R2700.

Article No.	*Description*
Z250i	IR/USB adapter for R2500
Z270i	IR/USB adapter for R2700

Converter from USB to RS485

USB to RS485, with galvanic isolation, for SINEAX V604s, VR660 or ALPUS.

Article No.	*Description*
163 189	USB/RS485 converter

Converter from USB to RS232-TT (Config Box)

USB to RS232, with galvanic isolation.

Article No.	*Description*
162 917	USB/RS232-TTL converter Config Box

Products for heavy current engineering

Display units

Multifunctional display units are used to monitor energy consumption in distribution facilities. They can replace numerous analogue indicators, have an integrated energy counter and partly network analysis functions. They may be connected to a PLC or control system via I/Os or bus connections (Modbus, Profibus, Ethernet, LON). Network configuration and connection parameters can be conveniently set via buttons or via PC software. Some versions permit customised parameterising of display data, e.g. the suppression of displays, priority displays or changing displays with interval control.

Transducers

The properties of multifunctional heavy current transducers can be completely programmed. They measure any variable of an electric network. The application (network configuration) and the behaviour of the analogue and digital outputs can be set by PC software without hardware variants. Measured value acquisition during operation is also supported via the programming or bus interface (Modbus, Profibus, Ethernet or LON). Programmable transducers are more resistant to interference in comparison with indicators and designed for more dynamic behaviour of the input signals.

Unifunctional transducers are of an analogue design. They are customised to the required measuring task during the manufacturing process. The DC signal proportionate to the measured value can be used for visualising via analogue indicators or further PLC processing. Converters are available for all basic variables in the electric network.

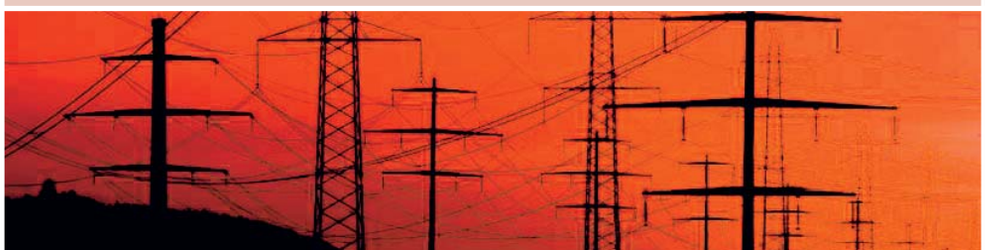
Power quality

The quality of energy available in electric networks is determined by the consumers connected. Their power consumption is often non-linear and influences the network quality negatively. This may impair the smooth operation of sensitive consumers (e.g. computers). The quality of network voltage which a power supplier has to provide is thus determined by international standards. But also energy consumers and equipment manufacturers must limit their feedback to the power system. For monitoring the compliance with standard values devices for temporary, mobile use and firm installation in the facility part to be monitored are available.

Energy management

Acquisition, analysis and optimising of the energy consumption and its allocation to generating cost centres is one of the central tasks of any company. To perceive the same on every level, we offer different product groups:

- Active power meters (calibrateable)
- Summation stations. To record meter readings centrally via pulse inputs or via LON bus.
- Peak load optimisers: To avoid power peaks the current energy requirement is determined and optimised by direct consumer control.
- Energy Control System (ECS): The solution for energy data acquisition in the industrial environment. This system provides the data for cost centre allocation and the basis for consumer and load optimising.



HEAVY CURRENT ENGINEERING

The deregulation of energy markets and the globally increasing environmental awareness define a high degree of responsibility for companies - to treat current as a precious raw material and to safeguard the non-dissipative management of this resource.

Products for angular position engineering

Angular position transducers

The angular position transmitters from Camille Bauer are precision instruments and serve for the acquisition of angular position and rotation, processing and the provision of measured values as electric output signals for the downstream device. They convert the angular position of a shaft into a load-independent direct current signal, proportional to the angular position.

The robust design makes the angular position transmitters of the KINAX WT7xx series particularly suited to applications in rough environments. The products are used in many areas, preferably in large machine construction, industrial plants, power plant construction, ship and offshore facilities, crane vehicles, large transport vehicles, dredger and drilling equipment.

The compact design of the KINAX to be installed or for surface mounting makes the angular position transmitters particularly suited to the installation in or mounting on devices and apparatuses. The products are used in many applications, e.g. railway engineering, industrial plants, ship building, power plant construction and gate positions.

Main features

- Simple connection technology with 2 , 3 , 4 wire or plug connector M12
- Absolut angular position is immediately available after switch on
- Non mechanical abrasion, low annual maintenance
- Vibration and shock-resistant
- Versions non programmable and programmable
- Analogue or digital output signals in CANopen and SSI with M12-plug connector
- Available in type of protection “Intrinsic safety” EEx ia IIC T6

Inclination transducers

The inclination transmitter from Camille Bauer converts the tilt angle into a direct current signal, proportional to the angle. The output signal is either available as an analog signal in form of a current change or digitally with a CANopen or SSI bus interface.

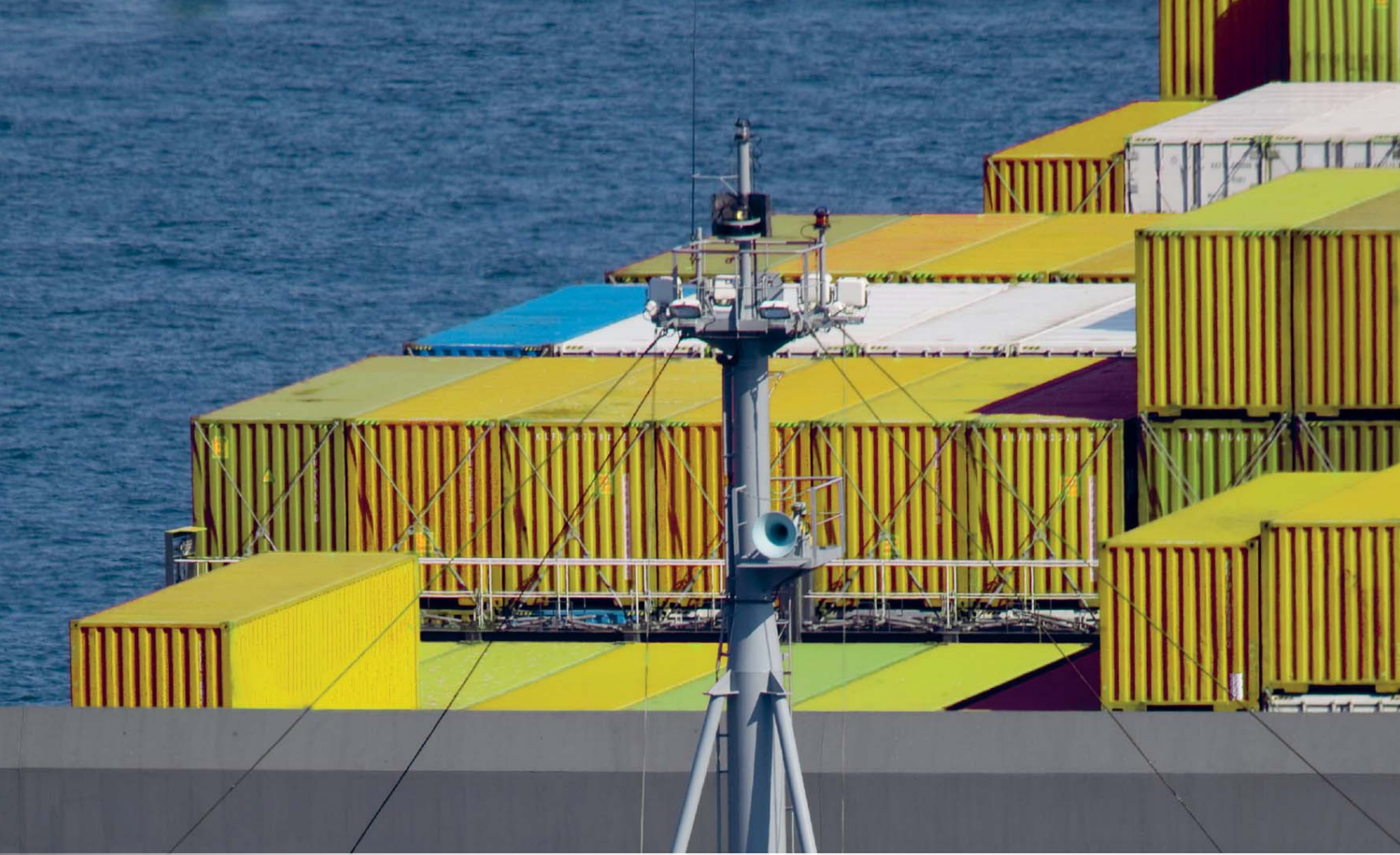
Magnetoresistive angular position transmitters are extremely robust measuring systems without a shaft stop, fully hermetically encapsuled and capable of measuring contactless the angular position of a permanent magnet, which is attached to the pendulum system.

Tilt angle values of a platform e.g. on cranes, heavy-duty vehicles, excavators and drilling machines, ships and offshore facilities stand for important measuring data as a part of the savety and control system of that type of machinery. Angular measurement, for instance for equipment levelling is performed in such cases.

For acquisition the angular position of a crane jib, lateral inclination of a vehicle, orientation of a lifting platform, weir trap or comparable facilities, alignment of solar panels or concave mirrors the KINAX N702 can also be used.

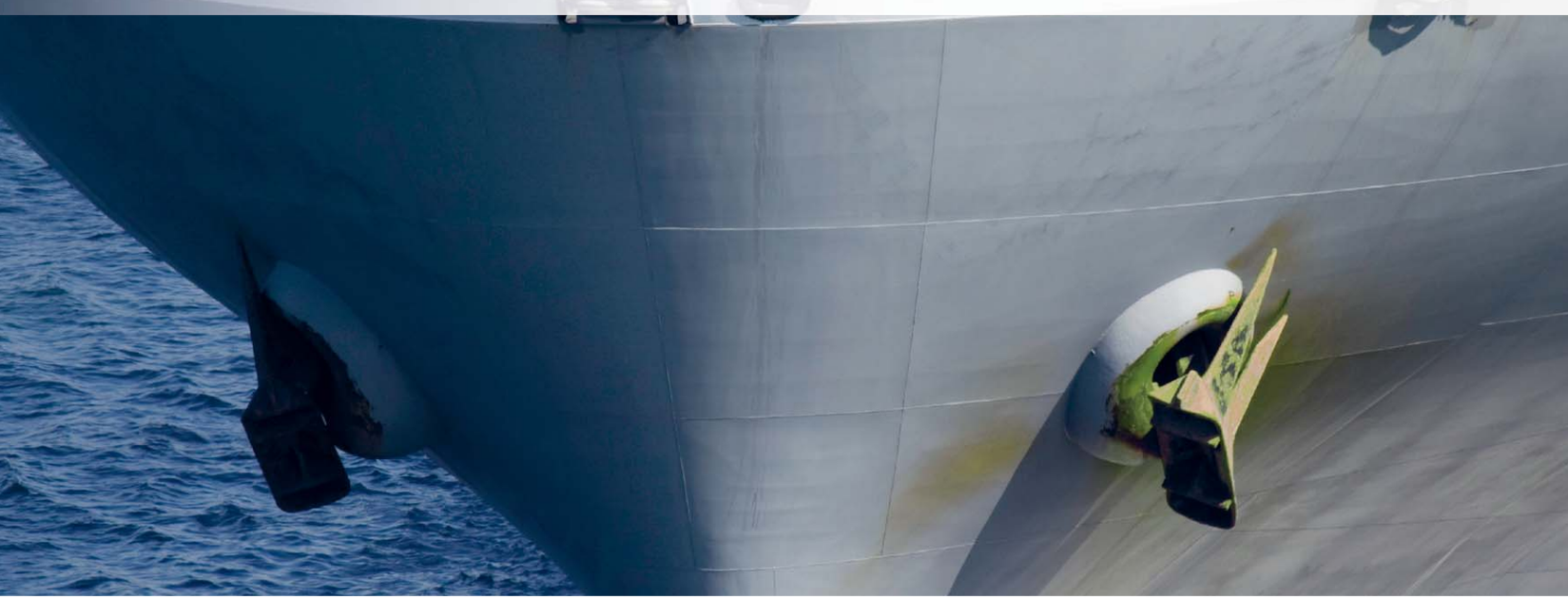
Main features

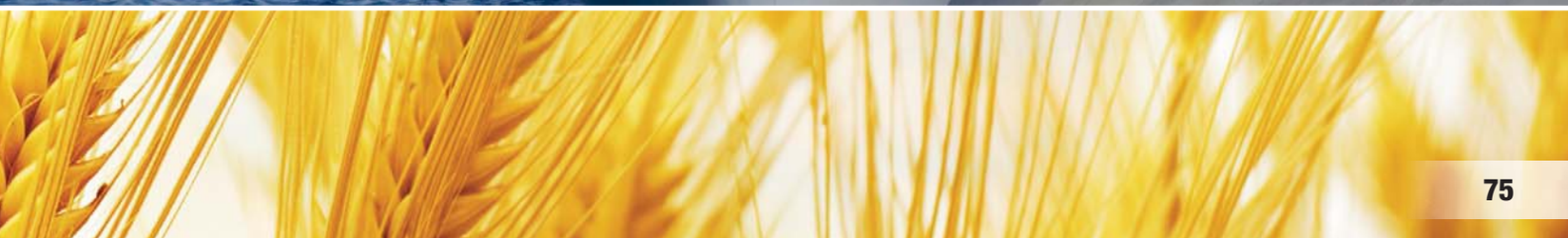
- Simple connection with plug connector M12
- Absolut angular position is immediately available after switch on
- Versions non programmable and programmable
- Analogue or digital output signals in CANopen and SSI with M12-plug connector



ANGULAR POSITION ENGINEERING

Be it the throttle valve of power plants, crane booms under heavy loads, passenger and container vessels at sea or aligned solar plants: Almost anywhere in machine construction and transport, even the smallest changes in inclination can cause substantial effects.





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Our group is represented all over the world by many affiliates and sales partners.
The name of GMC-Instruments is composed of the corporate names of Gossen, Metrawatt and Camille Bauer.**

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