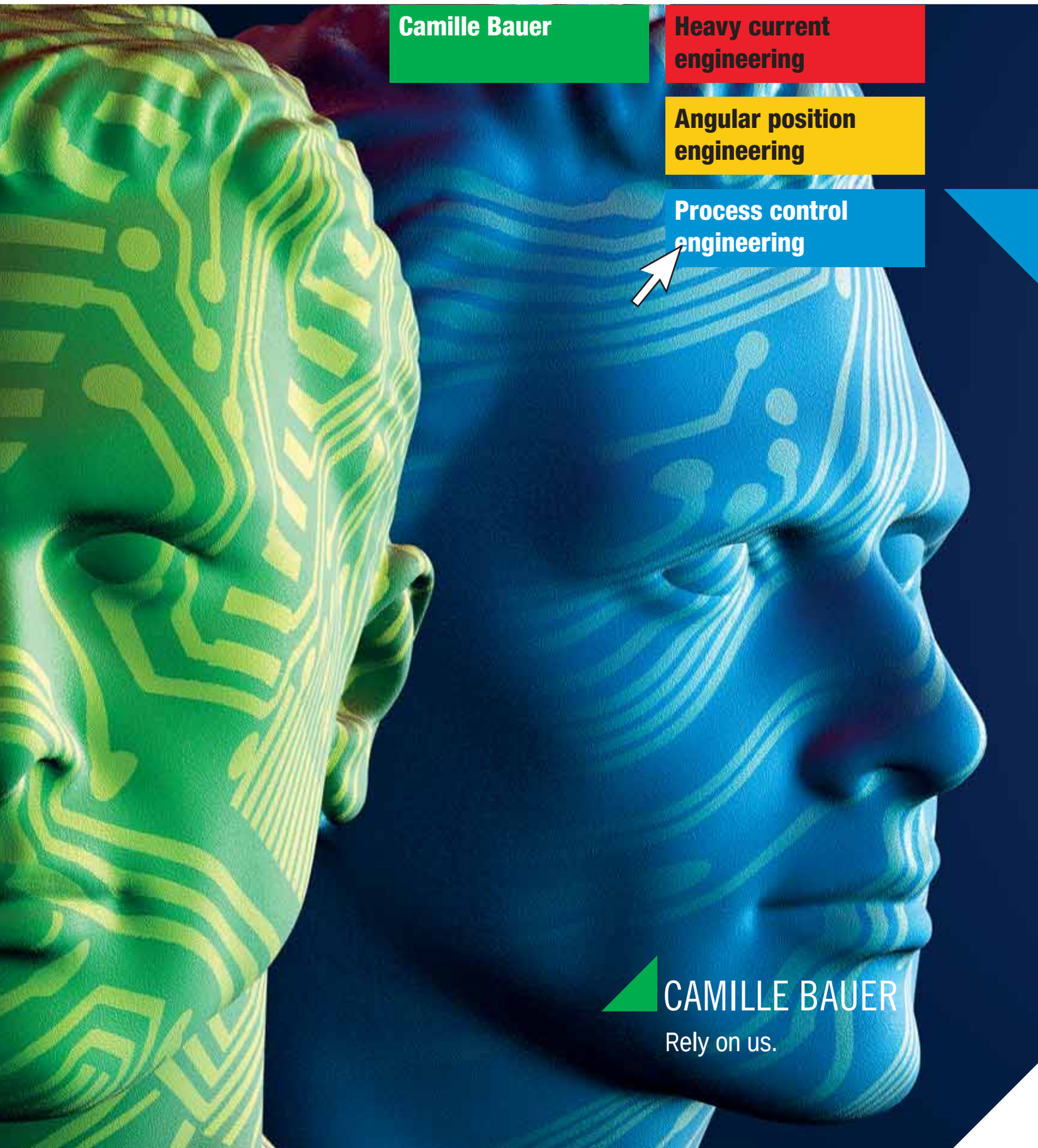
Process Control Engineering



Camille Bauer
Process Control Engineering at a glance

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 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.

For standard applications, use the 6-digit Article Number stated in this catalogue. These products are on stock and can be supplied within 3 days.

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.

Heavy current engineering

Angular position engineering

Process control engineering

Temperature

Analogue Signals

Process Management

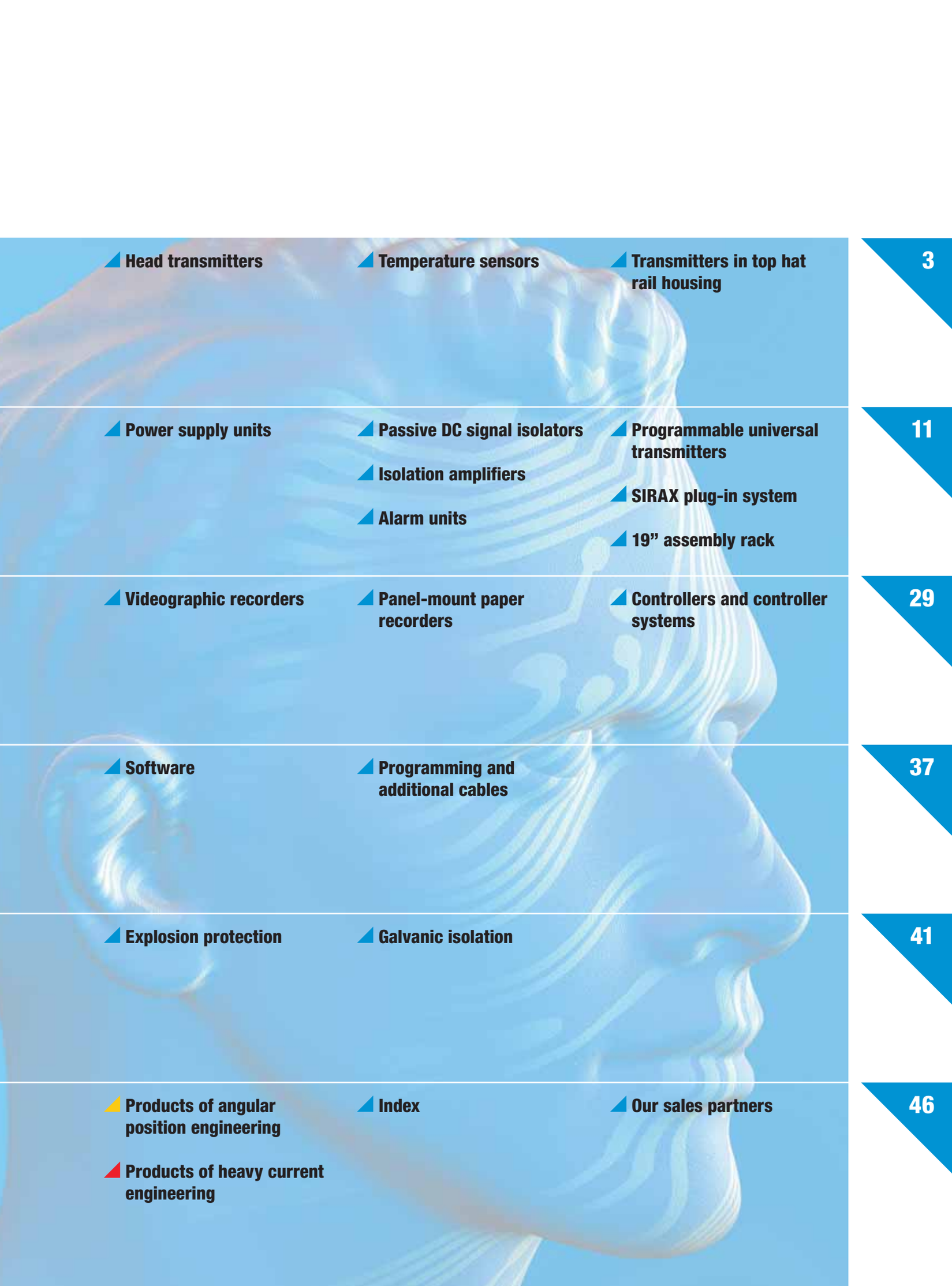
Software Accessories

Basics

Indices

CAMILLE BAUER
Rely on us.

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



Content Temperature

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 VK615

Programmable head transmitter

with or without galvanic isolation

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 38, PC connecting cable see page 40

SINEAX VK616

**SINEAX VK616
with galvanic isolation**

SINEAX VK626

Head transmitter HART

with galvanic isolation

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 VK636

Head transmitter Profibus

with galvanic isolation

Customer benefit

- Programmable via PC (Master Class 2)
- Applications in hazardous areas (Zone 1) according to FISCO
- Sensor breakage and short-circuit monitoring according to Profile 3.0

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: Connection to a common bus coupler according to IEC 61 158-2, transmission according to IEC 61 158-2
Ø x height: 43 x 30.8 mm

Stock variants

Article No.	*Description*
141 937	Non-Ex design, internal cold junction compensation
141 945	Ex design EEx ia IIC T6, internal cold junction compensation

Camille Bauer
Temperature Sensors

6

Temperature sensors

in standard and customised designs and with process connections for all industries

Resistance thermometers
- Head sensor
- Cable sensor
- Sheathed sensor
- Room sensor

Thermocouples
- Head sensor
- Cable sensor
- High temperature TC
- Sheathed TC
- Glass bath TC

Precision sensors
- Pt10, Pt25, Pt100
- Miniature fixpoint temperature measurement systems

Components and accessories
- Flanges
- Turned parts
- Threaded bushings
- Screw joints
- Connecting heads
- Sockets

More detailed information upon request

GMCtherm

SINEAX V608

Programmable temperature transmitter

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

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 38, PC connecting cable see page 40

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

Programmable temperature transmitters

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

Customer benefits

- 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 38, PC connecting cable see page 40

SINEAX V611

SINEAX V624

Programmable temperature transmitter

for thermocouples and resistance thermometers

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 [EEx ia] IIC, terminals not pluggable
141 929	Power supply 85–230 V AC/DC, Ex design [EEx ia] IIC, terminals not pluggable
143 438	Power supply 24–60 V AC/DC, Ex design [EEx ia] IIC, terminals pluggable
143 446	Power supply 85–230 V AC/DC, Ex design [EEx ia] IIC, terminals pluggable

Accessories

Configuration software see page 38, PC connecting cable see page 40

Other transmitters for temperature measurement:

– Programmable universal transmitter SINEAX/EURAX V604
– Programmable combined transmitter/alarm unit SINEAX/EURAX VC603
– Programmable universal transmitter SIRAX V644
– 2-channel programmable temperature transmitter SIRAX V606

Content Analogue Signals

Loop-powered supply unit

to energise 2-wire transmitters

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

For the design of the SIRAX plug-in system see page 23

SINEAX SI815

N17

S17

Power supply unit with additional functions

to energise 2-wire transmitters

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 (SINEAX) Plug-in card in European format, face plate width 4TE (EURAX)

Stock variant (only SINEAX)

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

19" assembly rack for EURAX plug-in cards see page 28
For the design of the SIRAX plug-in system see page 24

SINEAX B811

EURAX B811

SINEAX B812

Standard power supply unit

to energise 2-wire transmitters

HART® FIELD COMMUNICATIONS PROTOCOLL

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 [EEx ia] IIC, term. not pluggable
155 144	Power supply: 85–110 V DC/230 V AC, Ex design [EEx ia] IIC, terminals pluggable
155 095	Power supply: 24–60 V AC/DC, Ex design [EEx ia] IIC, terminals not pluggable
155 136	Power supply: 24–60 V AC/DC, Ex design [EEx ia] IIC, 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

One-channel passive 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 TI816

One and multichannel passive isolator

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

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

For the design of the SIRAX plug-in system see page 24

SINEAX TI807

N17

S17

SINEAX 2I1

One-channel passive isolator

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

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

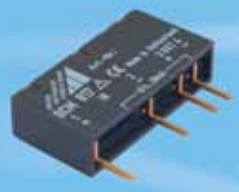
Technical data

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 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*
988 719	Straight connecting pins
988 727	Angled connecting pins

Programmable isolation amplifier

for unipolar and bipolar DC currents and voltages

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 mA…+1.5 mA to –100 mA…+100 mA
Voltage input:	–1.7 V…+1.7 V to –1000 V…+1000 V
Current output:	–0.5 mA…+0.5 mA to –20 mA…+20 mA
Voltage output:	–0.5 V…+0.5 V to –10 V…+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
147 258	Power supply 24–60 V, terminals not pluggable
147 266	Power supply 85–230 V, terminals not pluggable

Accessories
Configuration software see page 38, PC connecting cable see page 40

SINEAX TV809

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 mA…+0.1 mA to –40 mA…+40 mA, –0.06 V…+0.06 V to –1000 V…+1000 V
Output:	–1 mA…+1 mA to –20 mA…+20 mA, –1 V…+1 V to –10 V…+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 TV819

SINEAX TV829

High-voltage isolation amplifier

for shunt and voltage measurement on high potential

Customer benefit

- 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, ±20mA, ±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 TV808-11

Configurable isolation amplifier

for unipolar and bipolar DC currents and voltages

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

For the design of the SIRAX plug-in system see page 25

Isolation amplifier with HART

for DC currents and voltages and I/P valve positioner

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 mA…+1 mA to –20 mA…+20 mA, –0.06 V…+0.06 V to –20 V…+20 V
Output:	0…20 mA, 4…20 mA, 20 mA…0 mA, 20 mA…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

For the design of the SIRAX plug-in system see page 25

SINEAX TV808-115

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

For the design of the SIRAX plug-in system see page 26

SINEAX TV808-12

SINEAX C402

Alarm unit

for unipolar and bipolar DC currents and voltages

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 mA…+0.1 mA to –50 mA…+50 mA, –0.06 V…+0.06 V to –40 V…+40 V (Ex: max. ±30 V)
Output:	0…20 mA, 4…20 mA, ±20 mA or customised
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

For the design of the SIRAX plug-in system see page 26

Other devices with alarm functions:

– Isolation amplifier SINEAX TV809
– Programmable universal transmitter SINEAX/EURAX V604
– Programmable combined transmitter/alarm unit SINEAX/EURAX VC603
– Programmable universal transmitter SIRAX V644

Programmable universal transmitter

for thermocouples, resistance thermometers,
current, voltage and resistance

only SINEAX

Customer benefit

- All process variables as well as current and voltage output in one device
- 1 limit value relay offers monitoring function
- 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 Thermocouple type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re –1 mV…+1 mV to –40 V…+40 V (Ex: max. ±30 V), –40 µA…+40 µA to –50…+100 mA 0…8 Ohm to 0…5 kOhm
Output:	–2.5 mA…+2.5 mA to –22 mA…+22 mA or –2 V…+2 V to –12 V…+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 (SINEAX) Plug-in card in European format, face plate width 4TE (EURAX)

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

Stock variants EURAX V604

Article No.	*Description*
997 588	Power supply 24 – 60 V AC/DC, without cold junction compensation, non-Ex design
997 603	Power supply 85 – 230 V AC/DC, without cold junction compensation, non-Ex design
997 629	Power supply 24 – 60 V AC/DC, without cold junction comp., Ex design [EEx ia] IIC
997 645	Power supply 85 – 110 V DC / 230 V AC, without cold junction compensation, Ex design [EEx ia] IIC

Accessories

Configuration software see page 38, PC connecting cable see page 40

19” assembly rack for EURAX plug-in cards see page 28
For the design of the SIRAX plug-in system see page 22

SINEAX V604

EURAX V604

SINEAX VC603

EURAX VC603

Programmable combined transmitter/alarm unit

for thermocouples, resistance thermometers,
current, voltage and resistance

only SINEAX

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 mV…+1 mV to –40 V…+40 V (Ex: max. ±30 V), –40 µA…+40 µA to –50…+100 mA 0…8 Ohm to 0…5 kOhm
Output:	–2.5 mA…+2,5 mA to –22 mA…+22 mA or –2 V…+2 V to –12 V…+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 (SINEAX) Plug-in card in European format, face plate width 4TE (EURAX)

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

Stock variants EURAX VC603

Article No.	*Description*
997 455	Power supply 24–60 V AC/DC, without cold junction compensation, non-Ex design
997 471	Power supply 85–230 V AC/DC, without cold junction compensation, non-Ex design
987 497	Power supply 24–60 V AC/DC, without cold junction comp., Ex design [EEx ia] IIC
987 512	Power supply 85–110 V DC / 230 V AC, without cold junction compensation, Ex design [EEx ia] IIC

Accessories

Configuration software see page 38, PC connecting cable see page 40

19” assembly rack for EURAX plug-in cards see page 28

Programmable universal transmitter

for thermocouples, resistance thermometers, current, voltage and resistance

Customer benefit

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

Technical data

Input:	Pt10…1000, Ni10…1000, Pt20/20, Cu10/25, Cu20/25 2, 3 or 4-wire connection Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re –1 mV…+1 mV to –40 V…+40 V (Ex: max. ±30 V), –40 µA…+40 µA to –50…+100 mA 0…8 Ohm to 0…5 kOhm
Output:	–2.5 mA…+2.5 mA to –22 mA…+22 mA or –2 V…+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:	204 x 20.5 x 166 mm (SIRAX + BP902, 1 slot) 123.5 x 18 x 150.7 mm (SIRAX)

Stock variants SIRAX V644 + BP902 (1 slot)

Article No.	*Description*
125 296	Power supply 24–60 V AC/DC, without cold junction compensation, non-Ex design
125 303	Power supply 85–230 V AC/DC, without cold junction compensation, non-Ex design
125 311	Power supply 24–60 V AC/DC, without cold junction comp., Ex design [EEx ia] IIC
125 329	Power supply 85–110 V DC / 230 V AC, without cold junction compensation, Ex design [EEx ia] IIC

Stock variants SIRAX V644

Article No.	*Description*
998 809	Power supply 24–60 V AC/DC, without cold junction compensation, non-Ex design
107 913	Power supply 85–230 V AC/DC, without cold junction compensation, non-Ex design
107 921	Power supply 24–60 V AC/DC, without cold junction comp., Ex design [EEx ia] IIC
107 939	Power supply 85–110 V DC / 230 V AC, without cold junction compensation, Ex design [EEx ia] IIC

Accessories

Configuration software see page 38, PC connecting cable see page 40

For suitable brackets see page 27

SIRAX V644

SIRAX V606

2-channel programmable temperature transmitter

for thermocouples and resistance thermometers

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, Thermocouple 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…0V
Power supply:	24–60 V AC/DC or 85–230 V AC/DC
Height x width x depth:	123.5 x 18 x 150.7 mm

Stock variants

Article No.	Description
152 827	Power supply 24–60 V AC/DC, non-Ex design
152 835	Power supply 85–230 V AC/DC, non-Ex design
154 170	Power supply 24–60 V AC/DC, Ex design [EEx ia] IIC
154 188	Power supply 85–230 V AC/DC, Ex design [EEx ia] IIC

Accessories

Configuration software see page 38, PC connecting cable see page 40
For suitable brackets see page 27

SIRAX SI815

2-channel loop-powered supply unit

to energise 2-wire transmitters

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
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:	123.5 x 18 x 150.7 mm

Accessories

For suitable brackets see page 27

Power supply unit with additional functions

to energise 2-wire transmitters

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:	123.5 x 18 x 150.7 mm

Accessories
For suitable brackets see page 27

SIRAX B811

One and multichannel passive isolator

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

Customer benefit
- Current or voltage output for standard signals
- High degree of accuracy
- Isolates signals for hazardous areas
- Up to 3 channels in one housing

Technical data

Input:	0…20 mA
Output:	0…20 mA, 0…10 V
Test voltage:	4 kV
Leakage voltage:	2.7 V (non Ex design), 4.7 V or 6.3 V (Ex design)
Height x width x depth:	123.5 x 18 x 150.7 mm

Accessories
For suitable brackets see page 27

SIRAX TI807

SIRAX TV808-61

Configurable isolation amplifier

for unipolar and bipolar DC currents and voltages

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:	123.5 x 18 x 150.7 mm

Accessories
For suitable brackets see page 27

SIRAX TV808-615

Isolation amplifier with HART

for DC currents and voltages and I/P valve positioners

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

Technical data

Input:	–1 mA…+1 mA to –20 mA…+20 mA, –0.06 V…+0.06 V to –20 V…+20 V
Output:	0…20 mA, 4…20 mA, 20 mA…0 mA, 20 mA…4 mA
Power supply:	24–60 V AC/DC or 85–230 V AC/DC
Height x width x depth:	123.5 x 18 x 150.7 mm

Accessories
For suitable brackets see page 27

2-channel isolation amplifier

for unipolar and bipolar DC currents and voltages

Customer benefit
- 2 isolated channels or 1 input/2 outputs
- 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 or customised
Power supply:	24–60 V AC/DC or 85–230 V AC/DC
Height x width x depth:	123.5 x 18 x 150.7 mm

Accessories
For suitable brackets see page 27

SIRAX TV808-62

Alarm unit

for unipolar and bipolar DC currents and voltages

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 mA…+0.1 mA to –50 mA…+50 mA, –0.06 V…+0.06 V to –40 V…+40 V (Ex: max. ±30 V)
Output:	0…20 mA, 4…20 mA, ±20 mA or customised
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:	123.5 x 18 x 150.7 mm

Accessories
For suitable brackets see page 27

SIRAX C402

SIRAX BP902

Bracket

for SIRAX plug-in modules

Customer benefit

- Option of 1 slot or 8 slots
- Ex bracket with its own ATEX approval
- Slots can be coded
- Mechanical quick connection for simple fastening

Technical data

Power supply:	24 – 60 V AC/DC or 85 – 230 V AC/DC with 1.8 A T protection in 8 slots
Height x width x depth:	204 x 20.5 x 45 mm (1 slot) 204 x 165 x 50 mm (8 slots)

Stock variants

Article No.	Description
120 038	1 slot, non-Ex design
120 054	8 slots, non-Ex design
120 046	1 slot, Ex design [EEx ia] IIC
120 062	8 slots, power supply 85 – 230 V AC/DC, Ex design [EEx ia] IIC

19” Assembly rack

for plug-in cards in European format

Customer benefit

- Available in Ex and non-Ex design
- Ex and non-Ex devices may be combined in one assembly rack
- Solder, wire-wrap or screw terminals
- Customised completely or partly assembled rack

Technical data

Power supply: 24 – 60 V AC/DC or 85 – 230 V AC/DC

EURAX BT901

Content Process Management

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
- 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 A305

Videographic recorder with basic functions

for control cabinet installation

Customer benefit
- High-quality, cost-effective videographic recorder
- 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
- Data security in accordance with FDA 21CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

Technical data

Number of channels:	Up to 12 universal inputs
Display:	12.5 cm (5 inch) LCD
Operation:	6 buttons
Memory:	1 MB internally, up to 1 GB externally
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:	24
Additional functions:	12 totalisers
Height x width x depth:	144 x 144 x 195 mm

LINAX A310

LINAX A320

Videographic recorder with extended functions

for control cabinet installation

Customer benefit

- Videographic recorder of high quality and performance
- 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
- Data security in accordance with FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

Technical data

Number of channels:	Up to 12 universal inputs
Display:	12.5 cm (5 inch) LCD
Operation:	Touchscreen
Memory:	8 MB internally, up to 1 GB externally
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:	24
Additional functions:	12 totalisers, mathematic and logic functions
Height x width x depth:	144 x 144 x 195 mm

LINAX A330

High-performance panel-mount recorder

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
- 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
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

Panel-mount paper recorders

1 to 4-channel line recorder, LINAX 4000L / M / H

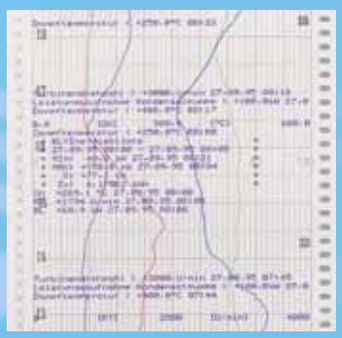
Functions

- Safe measurement due to galvanic isolation of the measuring channels
- Combined plotter for paper rolls or continuous fan-fold paper
- Automatic paper feed
- The modular design permits retrofitting of complete measuring systems
- LINAX 4000M
  – Free programming of the measuring task
  – Graphic representation of the measured values via printing channel
  – RS 485 interface
- LINAX 4000H
  – Representation of measured values and texts in the digital display
  – RS 485 interface
  – Measured value storage also in standby operation
  – Option to record mean values, sums or minimum and maximum values in the interval
  – 64 m paper roll

Technical data

Measuring inputs:	Thermocouple, Pt100, DC, DC voltage depending on recorder design
Power supply:	24 – 85 V AC/DC, 95 – 240 V AC/DC
Height x width x depth:	144 x 144 x 250 mm (L/M), 144 x 144 x 300 mm (H)

LINAX 4000



Panel-mount paper recorder

6-colour dot printer, POINTAX 6000L2 / M

Functions

- 6 measuring channels
- Last printed point visible from the front
- Measuring channels galvanically isolated and earth-free
- Combined plotter for paper rolls (32 m) or continuous fan-fold paper (16 m)
- RS 485 interface
- Parameterising software PARATOOL
- 6000M
  – Text printout
  – 2 limit values per channel
  – Balancing
  – 4 event marks
  – Alternative applications as an event recorder with 10 event marks

Technical data

Measuring input:	Thermocouple, Pt100, DC, DC voltage according to recorder design
Power supply:	24 – 85 V AC/DC, 95 – 240 V AC/DC
Height x width x depth:	144 x 144 x 250 mm

POINTAX 6000

R2500

R2700

Compact controller and temperature limiter

for control cabinet installation

Customer benefit

- Cost-effective controller and limiter with extensive functionalities
- Structured operating and programming procedure
- CompactConfig software tool free of charge
- 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

4-/8-channel control module for SIMATIC platform

System compatible for S7-300

Customer benefit

- Central bus connection via back plane, decentralised connection via Profibus slave
- Control channels freely configurable as well as any allocation of the outputs
- Structured operating and programming procedure
- 355Config software tool free of charge
- R355Remote; remote maintenance tool via CPU independent of interfaces
- 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, DC or DC voltage
Outputs:	Binary I/Os, continuous
Power supply:	24 V DC (18 – 30 V DC)
Height x width x depth:	125 x 40 x 120 mm (4 channels) 125 x 80 x 120 mm (8 channels)

Stock variants

Article No.	*Description*
R355A	4 channels, measuring input current/voltage, without binary I/Os
R355B	4 channels, measuring input current/voltage, without binary I/Os
R355C	8 channels, measuring input current/voltage, without binary I/Os
R355D	8 channels, measuring input thermocouple/Pt100, without binary I/Os
R355E	4 channels, measuring input current/voltage, 8 binary I/Os
R355F	4 channels, measuring input thermocouple/Pt100, 8 binary I/Os
R355G	8 channels, measuring input current/voltage, 24 binary I/Os
R355H	8 channels, measuring input thermocouple/Pt100, 24 binary I/Os

R6000

8-channel control module

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

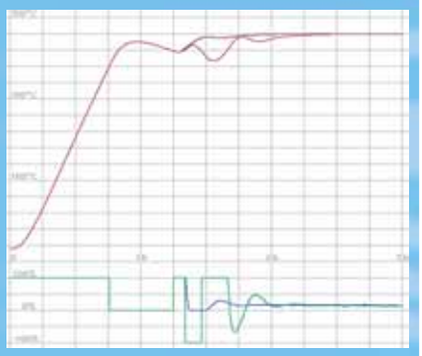
Technical data

Measuring inputs:	Thermocouple, Pt100, Ni100, 50 mV linear
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

PDPI SOFTcontroller



PDPI SOFTcontroller

in CoDeSys programming language

Customer benefit

- Simple integration into all control systems of the CoDeSys Alliance
- 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

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)

SINEAX VR660 / A200R

Content Software, Accessories

Configuration software

to parameterise programmable CB devices

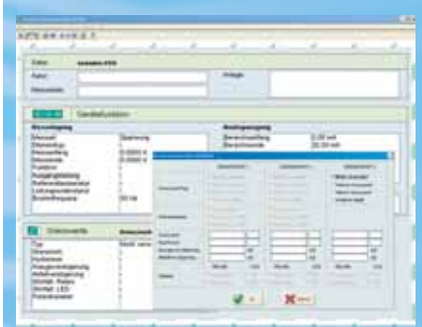
The CD contains the following PC software:

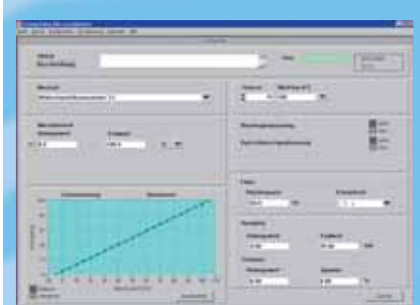
VC600, V600*plus*
- Accessing the configuration stored in the transmitter and printing it as a protocol
- Fetching and visualising the allocation of electrical terminals (for measured variable, output signal, contact output and power supply)
- Simulating measured value, underflow, overflow and sensor 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.

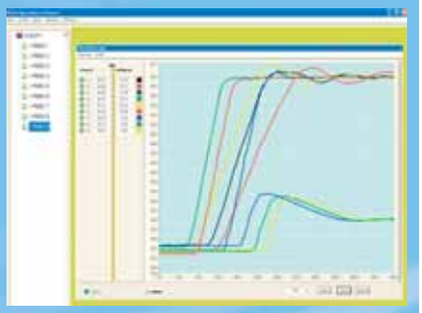


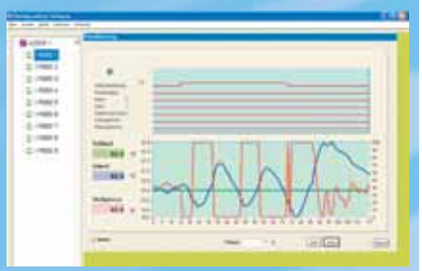


Content of the CD

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

The software permits free access to A200R (bus master) and thus to the VR660 temperature controllers or directly to the temperature controllers

- 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 universal measuring unit for heavy current variables SINEAX CAM.

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

This CD is part of the scope of delivery of SINEAX VR660 and SINEAX CAM.

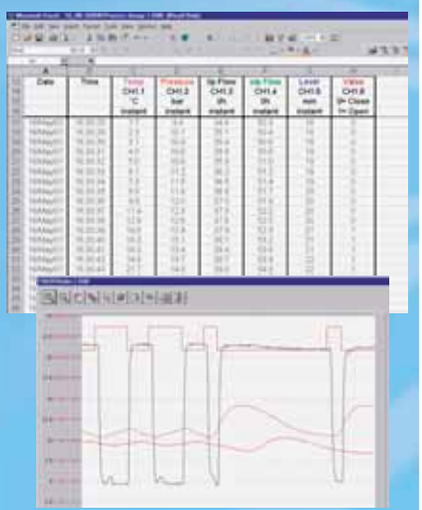
Profibus mini-CD

for the head transmitter SINEAX VK636

The CD contains the PA 3.0 and EDD profile, GSD files as well as a commissioning guide and further documents.
It may also be used for the multitransmitter for heavy current variables, SINEAX DME406, and the EMMOD 204 supplementary module for the multifunctional power instruments of the A2xx series.

Article No.	*Description*
150 764	Profibus mini-CD

This CD is part of the scope of delivery of SINEAX VK636, SINEAX DME406 and EMMOD 204.



Data Manager 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
- Easily operated software with which users are immediately familiar:
  Designed as an „add-in" for Microsoft Excel

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

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				•	•	

Explosion protection through intrinsic safety „i“

Camille Bauer I&C instruments for the acquisition of signals in potentially explosive atmospheres are designed to comply with the explosion protection category “intrinsically safe”. Intrinsically safe electrical circuits are incapable of igniting potentially explosive atmospheres either by means of sparking or thermal effect under the fault conditions specified below. To this end, the electrical energy of the circuit is restricted by voltage and current limiters. The term intrinsic safety is generally abbreviated to the letter „i“.

Categories ia and ib

Electrical circuits do not cause ignition during normal operation:

ia	If a single fault or a combination of any two faults occurs
ib	If a single fault occurs

Zones and Gases

The zones in which potentially explosive atmospheres occur are classified as follows:

Zone 0	Gas is present continuously or for long periods
Zone 1	Gas is likely to occur
Zone 2	Gas is seldom present and only for short periods of time

The large number of various gases are categorised into explosion groups IIA, IIB and IIC. The danger of explosion is greatest for Category IIC.

Intrinsically safe equipment

- All circuits are intrinsically safe
- Not allotion within the explosion hazard area

Marking and Electrical Data,
e.g.: EEx ia IIC T6

EEx	Complies with EN 50…
ia	Type of protection
IIC	Explosion group
T6	Temperature class

U_{max} or U_i	Max. permissible input voltage
I_{max} or I_i	Max. permissible input current
P_{max} or P_i	Max. permissible input power
C_i	Internal capacitance
L_i	Internal inductance

The temperature class indicates the max. surface temperature of the apparatus:

T1	450 °C	T4	135 °C
T2	300 °C	T5	100 °C
T3	200 °C	T6	85 °C

The lowest ignition temperature of the potentially explosive atmosphere must be greater than the max. surface temperature.

Associated Electrical Apparatus

- Electrical circuits are intrinsically safe and non intrinsically safe
- Installation outside of the potentially explosive atmosphere

Marking and Electrical Data, e.g.: [EEx ia] IIC

[ ]	Associated electrical apparatus
EEx	Complies with EN 50…
ia	Type of protection
IIC	Explosion group

U_o	Max. output voltage
I_k or I_o	Max. output current
P or P_o	Max. output power
C_a or C_o	Max. permissible external capacitance
L_a or L_o	Max. permissible external inductance

The manufacturer, the device type, the Ⓔx mark and the test number from the testing authority are affixed to both apparatus types.

Guideline RL 94/9/EG / ATEX

This guideline has been in effect since 1.7.2003. The most important part is the conformity evaluation procedure.

This requires that a manufacturer classifies his Ex device into one of three categories, which is then assigned to a zone. Depending on the category, various QA measures must be implemented for the manufacture of explosion protected devices. E.G., Category 1 requires QS production. The ref. number of the notified body (NB) is located next to the CE mark. The group, category and letter G (gas) or D (dust) explosion protection must appear next to the Ex mark on the label.

Marking with Type Examination Certificate:
PTB 97 ATEX 2074 X

97	Year of approval
ATEX	EC guideline
2074	Test laboratory no
X	Special condition(s)

Marking: Ⓔx II (1) G CE 0102

Ⓔx	Identification of Ex protection
II	Group
(1)	Category, with ( ) = associated, without ( ) = intrinsically safe equipment
G	G = Gas explosion protection D = Dust-Ex
0102	NB number (production monitoring body) 0102 = PTB

The CAMILLE BAUER AG product range is designed for Zone 1. Explosion Group IIC. It is thus permissible to use them in zone 2 and also as Group IIB or IIA devices. All Category ia devices with electrical insulation and Category 1 devices conforming to Guideline 94/9/EC fulfil the requirements for Zone 0. Note, however, that Category 1 is only one of the conditions required for Zone 0.

Installation according to EN 60 079-14

Additional specifications for intrinsic safety are given in Section 12 of EN 60 079-14 which is in force as VDE 0165 in Germany. Most importantly, this standard sets forth installation rules for Zones 1 and 2, supplementary precautions for Zone 0 and the wiring requirements for and verification of intrinsic safety. The following applies where active and passive devices are interconnected:

$U_i \geq U_o$ and $I_i \geq I_k$ and $P_i \geq P$

Providing the circuit does not include energy storing components, the cable length is determined on the basis of its C and L values. The maximum permissible cable length is given by. $C_o(C_a) - C_i$ and $L_o(L_a) - L_i$ and the specific C and L of the cable..

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. 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.

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

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. 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 hand-held 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.

Galvanic isolation

Despite the high degree of automation and the proliferation of fieldbus systems, components for galvanic isolation are indispensable. Corresponding signal converters do not only convert a signal but also serve the safety of people and plants. Particularly in the measurement of high voltages, different chassis potentials or in hazardous areas, direct measurement is prohibited, dangerous or will lead to inaccurate results.

The signal converters of Camille Bauer are equipped with 3-port isolation and safely separate the three circuits of input, output and power supply from each other. Mutual interaction is thus prevented. Safe galvanic isolation is particularly vital if the signal has or can accept a high potential. The value of the measuring signal is not decisive but that of the working voltage. (Figure 1)

While the measuring signal only amounts to 10 mV, the working voltage is 100 V. Safe isolation of a component must be designed for the high working voltage, otherwise the product does not provide any (contact) protection on the output side. The devices of the TV829 series offer people and plants this protection for

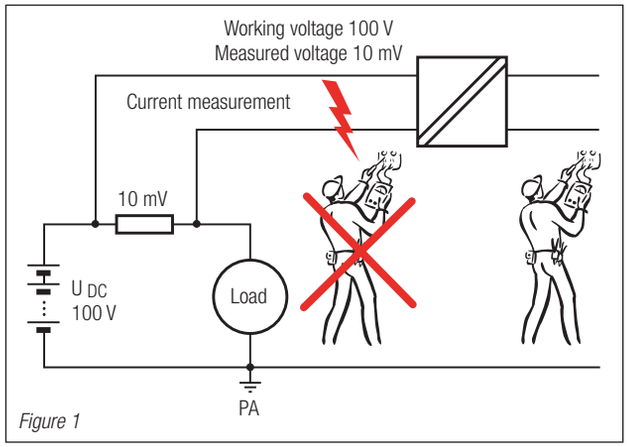


Figure 1

working voltages of max. 3600 V DC and have test voltages of up to 15 kV. If several measurements are taken in the same circuit, clean galvanic isolation is absolutely necessary. Otherwise, short circuits may be caused via ground or earth potentials. (Figure 2)

Reliable procedures in process plants depend to a large extent on unobjectionable measuring signals. The direct connection of the measuring point, e.g. with the control system, presents a problem, particularly in broadly spread out plants. Unknown interference currents can flow and influence the measuring signal due to different potentials of the PA system. (Figure 3). For this reason, multiple grounding of an intrinsically safe circuit is prohibited for measurements in hazardous areas. (Figure 4). While the functional intrinsically safe current is limited by the resistance and the Z-diode, an unknown current would get into the hazardous area due to the different potentials in multiple grounding.

If instrument leads cover long distances, the signal converter amplifies the signal. In addition, wiring is subjected to electromagnetic interference. The isolating components thus assume the task of filtering or uncoupling.

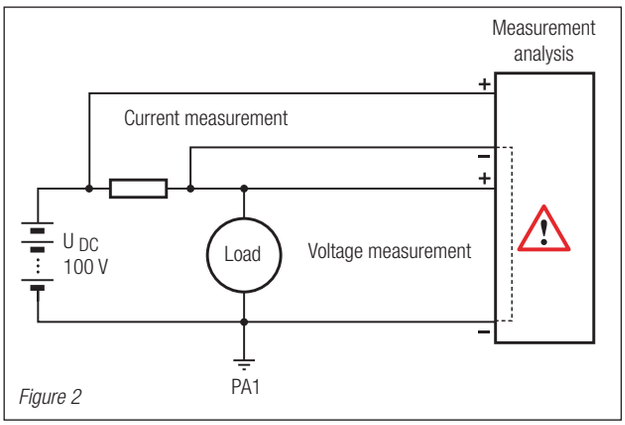


Figure 2

Isolation amplifiers

The isolation amplifiers of Camille Bauer measure unipolar or bipolar currents or voltages and convert the same again into a current or voltage signal. Applications cover shunt voltages (60 mV) through to high voltages (3600 V). One of the main tasks of these devices is the conversion of the signal into another variable, e.g. from mA into V. But also compression (0…20 mA to 0…10 mA) or expansion (0…20 mA to 0…40 mA) of the signal is possible. Furthermore, the isolation amplifiers offer the possibility of combining different transfer standards (0…50 mA to 0…20 mA).

For the actuation of so-called SMART transmitters, Camille Bauer offers isolation amplifiers also in HART design. In the intrinsically safe version, these devices isolate signals from hazardous areas. This involves a so-called interconnection of two intrinsically safe circuits because the signal source is active. Since a respective calculation is too extensive, Camille Bauer has already calculated common circuit combinations and printed them in the ATEX certificate.

Passive isolators

The typical task of passive isolators is the galvanic 1:1 isolation of 0/4…20 mA loops. In addition, the transformation of current into voltage is also possible. These devices include the advantage that they do not require any power supply and that they can be retrofitted into a measuring circuit. The low response current of usually 5…20 µA guarantees the use and accuracy also in 0…20 mA measurements. Passive isolators not only form a galvanic isolation but also serve filtering. The products are often used if interference occurs in an already existing plant and the cause is difficult to ascertain.

For applications in hazardous areas, passive isolators are a favourable and, nevertheless, safe solution to isolate signals. TI807 was intentionally designed not to have any active U_o- and I_o-values. Users do not need a complicated intrinsic safety calculation.

Transmitter power supply units

Different terms are used in the market for transmitter power supply units, e.g. supply isolator. Apart from isolating the signal, these devices also provide power for the transmitter. The signal (4…20 mA) and the supply is arranged via the same (two) connections and, therefore, the term two-wire technology is used. In addition, Camille Bauer power supply units are HART-compatible. B811 offers the additional feature of converting the current signal into a voltage or non-standard signal. The power supply units of the B8xx series are designed in such a fashion that they are compatible with both Camille Bauer temperature and angular position transmitters and all two-wire transmitters commonly available in the market. This is particularly applicable to the Ex version.

Temperature transmitters
Temperature transmitters convert the value of, e.g., Pt100 sensors or thermocouples into a current or voltage signal. A major part of Camille Bauer products is fully programmable so that both the sensor types and the output signal can easily be adapted to the task. Galvanic isolation is of utmost importance in temperature instrumentation. Particularly so, if the sensor is connected to a grounded item (e.g. sensor tube) or a high potential (e.g. motor or transformer coil).

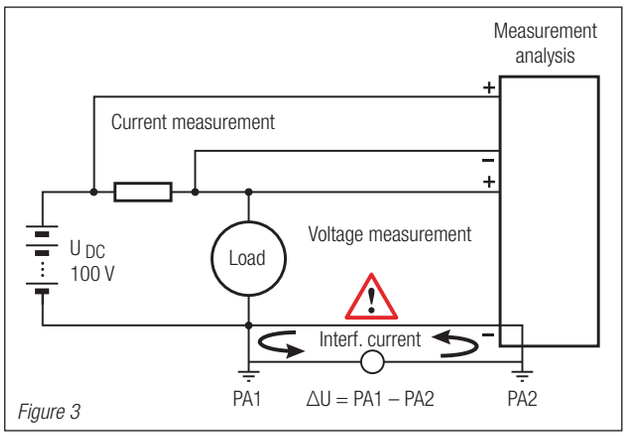


Figure 3

Head transmitters measuring the temperature on site, convert the sensitive measuring signal into a standard 4…20 mA current loop. The same is more robust in relation to interference than the measuring signal and, in addition, can be transmitted across longer distances. Also in this case, a galvanically isolated head transmitter must be used if the sensor and the analysis are on different potentials.

Head transmitters are mostly subjected to high ambient temperatures which reduce their useful life. Two-wire transmitters are an alternative and can be installed on a top-hat rail close to the process, e.g. SINEAX V610 or V611. SINEAX V608 can even be operated in Zone 1 of hazardous areas.

Alarm units
It is not only C402 which offers the possibility of limit monitoring via relays. Also the programmable devices of TV809, V604, V644 and VC603 fulfil this function for current, voltage or temperature signals. The relays guarantee safe galvanic isolation and permit the connection of 230 V AC.

Universal transmitters
Spare part stocks for numerous isolating functions pose logistic problems to operators. Universal, programmable transmitters with integrated limit detection like V604, V644 or VC603 are the answer. Employing simple software users program these products in a very brief period of time for the desired measuring task, e.g. current, voltage, resistance or temperature measurement.

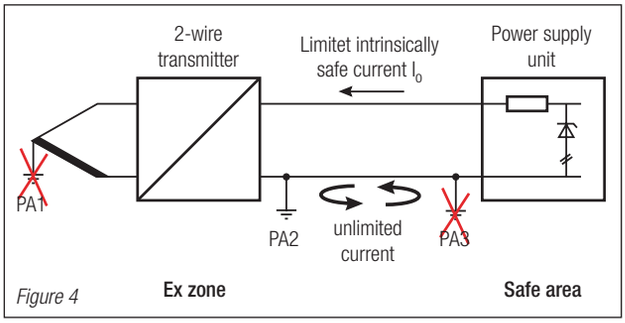


Figure 4

KINAX series

Angular position transmitters detect the position of a shaft and convert it into a proportional DC signal. The position is measured by a non-contact, capacitive sensor system which is patented and completely free of wear and tear. Versions for OEM, surface mounting, machine construction or position feedback applications are available. The program also includes designs for hazardous areas.

- Absolute position is immediately available after activation
- Non-contact and thus free of wear and tear
- Very robust – therefore shockproof (50g) and vibrationproof (5g/≤200Hz)
- Long-term stable due to simple, reliable electronics
- Measured value infinite and without any rounding error

Linear acquisition of angular position

Linear single-turn and multiturn rotary encoders adjustable on site

Customer benefit
- Simple connection technique with 2, 3 or 4 wires
- Simple installation and value display using analogue output
- Adjustable on site: Zero point ±5%, final value variation +5%/-30% (60%)
- High accuracy of 0.5% in versions for 10°, 30° 60°, 90° and 1.5% in versions for 180° and 270°

Technical properties
- Angular position measuring range: 0...5° to 0...270°
- Linear distance measurement: 0...10 mm to 0...140 mm
- Measuring output 0...1 mA to 0/4...20 mA
- Zero point and span adjustable
- Accuracy 0.5%
- Housing ingress protection up to IP66

Linearisable acquisition of angular position

Programmable singleturn and multiturn rotary encoders

Customer benefit
- Simple 2-wire connection technique
- Simple calibration with PC software (known angular position and characteristic curve)
- Measuring range, switch point, characteristic curve and direction of rotation programmable
- Characteristic curve freely programmable via 20 data points (for non-linear curves)
- Measured value simulation / measured value acquisition are further convenient aids

Technical properties
- Angular position measuring range: 0...60° and 0...360°
- Linear distance measurement: 0...10 mm to 0...140 mm
- Measuring output 4...20 mA
- Accuracy 0.5%
- Housing ingress protection up to IP66

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.

Index

Camille Bauer
Our Sales Partners

Development and production:

Switzerland:

CAMILLE BAUER

Camille Bauer AG
Aargauerstrasse 7
CH-5610 Wohlen / Switzerland

Phone +41 56 618 21 11
Fax +41 56 618 35 35

Germany:

GOSSEN METRAWATT

GMC-I Gossen-Metrawatt GmbH
Thomas-Mann-Str. 16 – 20
D-90471 Nürnberg

Phone +49 911 8602 - 111
Fax +49 911 8602 - 777

info@gossenmetrawatt.com
www.gossenmetrawatt.com

Distribution Germany:

GMC-I Gossen-Metrawatt GmbH
Thomas-Mann-Str. 16 – 20
D-90471 Nürnberg

Phone +49 911 8602 - 111
Fax +49 911 8602 - 777

info@gossenmetrawatt.com
www.gossenmetrawatt.com

Distribution France:

GMC-Instruments France SA
5, rue Pasteur
F-91349 MASSY Cedex

Phone +33-1-6920 8949
Fax +33-1-6920 5492

info@gmc-instruments.fr
www.gmc-instruments.fr

Distribution Italy:

GMC-Instruments Italia S.r.l.
Via Romagna, 4
I-20046 Biassono MI

Phone +39 039 248051
Fax +39 039 2480588

info@gmc-i.it
www.gmc-instruments.it

Distribution Netherlands:

GMC-Instruments Nederland B.V.
Daggeldersweg 18
Postbus 323
NL-3440 AH Woerden

Phone +31 348 421155
Fax +31 348 422528

info@gmc-instruments.nl
www.gmc-instruments.nl

Distribution Switzerland:

GMC-Instruments Schweiz AG
Glattalstrasse 63
CH-8052 Zürich

Phone +41-44-308 80 80
Fax +41-44-308 80 88

info@gmc-instruments.ch
www.gmc-instruments.ch

Distribution Spain:

Electromediciones Kainos, S.A.
Energía 56, Nave 5
E-08940 Cornellà -Barcelona

Phone +34 934 742 333
Fax +34 934 743 447

kainos@kainos.es
www.kainos.es

Distribution Czech Republic:

GMC-měřicí technika s.r.o
Fügnerova 1a
CZ-678 01 Blansko

Phone +420 516 482 611-617
Fax +420 516 410 907

gmc@gmc.cz
www.gmc.cz

CAMILLE BAUER

Rely on us.

Camille Bauer Ltd
Aargauerstrasse 7
CH-5610 Wohlen / Switzerland

Phone: +41 56 618 21 11
Fax: +41 56 618 35 35

e-Mail: info@camillebauer.com
www.camillebauer.com