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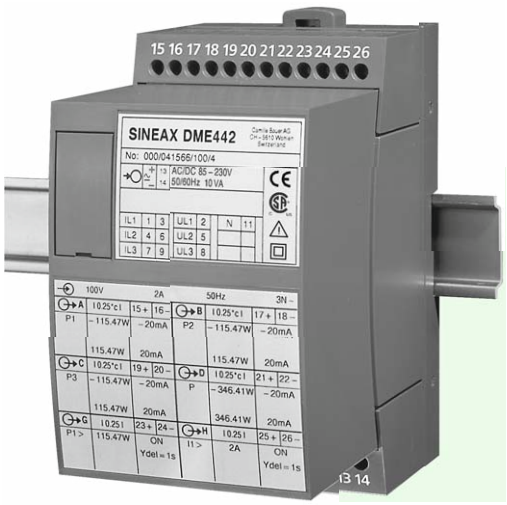


# Программируемый мультипреобразователь SINEAX DME424, DME442

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# SINEAX DME 424/442
# Programmable Multi-Transducers

**for the measurement of electrical variables in heavy-current power systems**

## Application

The **SINEAX DME 4** series of multi-transducers (Fig. 1) **simultaneously** measure several variables of an electric power system and process them to produce 2 resp. 4 analog output signals.

2 or 4 digital outputs are available for signalling limits or energy metering. For two of the limit outputs up to three measurands can be logically combined.

The multi-transducers are also equipped with an **RS 232** serial interface to which a PC with the corresponding software can be connected for programming or accessing and executing useful ancillary functions.

The usual modes of connection, the types of measured variables, their ratings, the transfer characteristic for each output etc. are the main parameters that have to be programmed.

Ancillary functions include a power system check, provision for displaying the measured variably on a PC monitor, the simulation of the outputs for test purposes and a facility for printing name-plates.

The transducer fulfils all the essential requirements and regulations concerning electromagnetic compatibility **(EMC)** and **safety** (IEC 1010 resp. EN 61 010). It was developed and is manufactured and tested in strict accordance with the **quality assurance standard** ISO 9001.

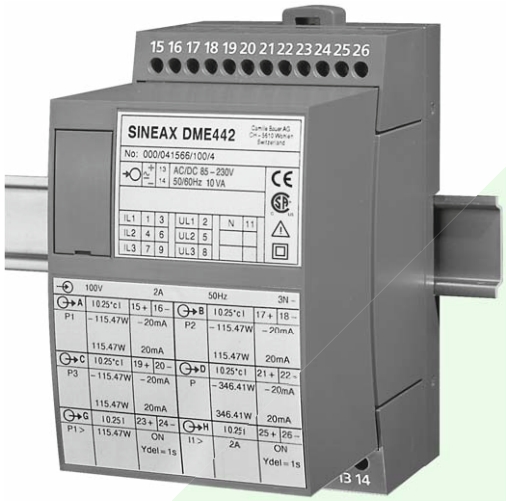


*Fig. 1. The **universal** basic version SINEAX DME 442 in housing **T24,** clipped onto a top-hat rail.*

## Features / Benefits

- **Simultaneous measurement of several variables of a heavy-current power system / Full supervision of an asymmetrically loaded four-wire power system, rated current 1 to 6 A, rated voltage 57 to 400 V (phase-to-neutral) or 100 to 693 V (phase-to-phase)**
- **Input voltage up to 693 V (phase-to-phase)**
- **Universal analog outputs (programmable)**
- **High accuracy: U/I 0.2%, P 0.25% (under reference conditions)**
- **Universal digital outputs (meter transmitter, limits)**
- **Up to 2 or 4 integrated energy meters, storage every each 203 s, storage for: 20 years**
- **Windows software with password protection for programming, data analysis, power system status simulation, acquisition of meter data and making settings**
- **AC/DC power supply / Universal**
- **Provision for either snapping the transducer onto top-hat rails or securing it with screws to a wall or panel**

| Measured variables | Output | Types |
|---|---|---|
| Current, voltage (rms), active/reactive/apparent power cosφ, sinφ, power factor | **2 analog outputs and 4 digital outputs** or **4 analog outputs and 2 digital outputs** | **DME 424** / **DME 442** |
| RMS value of the current with wire setting range (bimetal measuring function) | Data bus LON see data sheet DME 400-1 Le | DME 400 |
| Slave pointer function for the measurement of the RMS value IB<br>Frequency | 4 analog outputs and bus RS 485 (MODBUS) see data sheet DME 440-1 Le | DME 440 |
| Average value of the currents with sign of the active power (power system only) | Without analog outputs, with bus RS 485 (MODBUS) see data sheet DME 401-1 Le | DME 401 |
| | PROFIBUS DP see data sheet DME 406-1 Le | DME 406 |

# SINEAX DME 424/442
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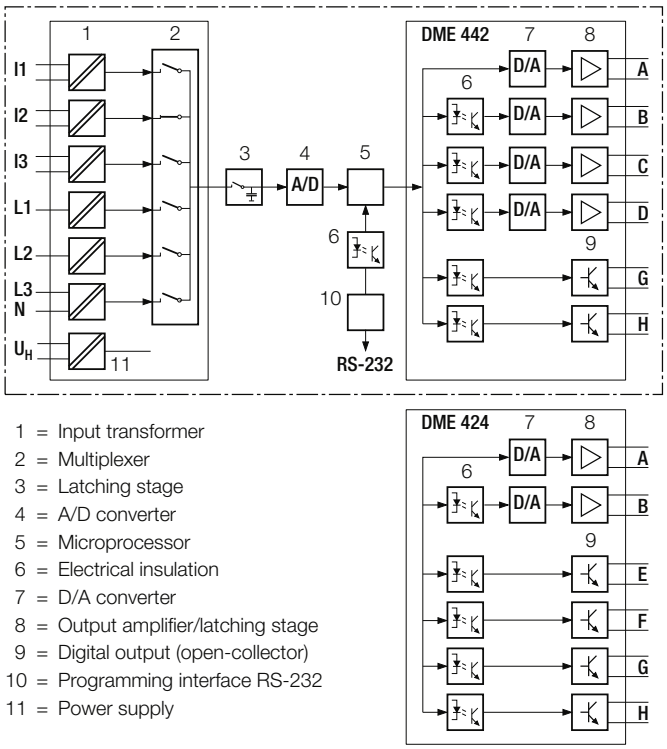



1 = Input transformer
2 = Multiplexer
3 = Latching stage
4 = A/D converter
5 = Microprocessor
6 = Electrical insulation
7 = D/A converter
8 = Output amplifier/latching stage
9 = Digital output (open-collector)
10 = Programming interface RS-232
11 = Power supply

*Fig. 2. Block diagram.*
*A, B, C, D = analog outputs; E, F, G, H = digital outputs.*

## Symbols

| Symbols | Meaning |
|---|---|
| X | Measured variable |
| X0 | Lower limit of the measured variable |
| X1 | Break point of the measured variable |
| X2 | Upper limit of the measured variable |
| Y | Output variable |
| Y0 | Lower limit of the output variable |
| Y1 | Break point of the output variable |
| Y2 | Upper limit of the output variable |
| U | Input voltage |
| Ur | Rated value of the input voltage |
| U 12 | Phase-to-phase voltage L1 – L2 |
| U 23 | Phase-to-phase voltage L2 – L3 |
| U 31 | Phase-to-phase voltage L3 – L1 |
| U1N | Phase-to-neutral voltage L1 – N |
| U2N | Phase-to-neutral voltage L2 – N |
| U3N | Phase-to-neutral voltage L3 – N |
| UM | Average value of the voltages (U1N + U2N + U3N) / 3 |

| Symbols | Meaning |
|---|---|
| I | Input current |
| I1 | AC current L1 |
| I2 | AC current L2 |
| I3 | AC current L3 |
| Ir | Rated value of the input current |
| IM | Average value of the currents (I1 + I2 + I3) / 3 |
| IMS | Average value of the currents and sign of the active power (P) |
| IB | RMS value of the current with wire setting range (bimetal measuring function) |
| IBT | Response time for IB |
| BS | Slave pointer function for the measurement of the RMS value IB |
| BST | Response time for BS |
| φ | Phase-shift between current and voltage |
| F | Frequency of the input variable |
| Fn | Rated frequency |
| P | Active power of the system P = P1 + P2 + P3 |
| P1 | Active power phase 1 (phase-to-neutral L1 – N) |
| P2 | Active power phase 2 (phase-to-neutral L2 – N) |
| P3 | Active power phase 3 (phase-to-neutral L3 – N) |
| Q | Reactive power of the system Q = Q1 + Q2 + Q3 |
| Q1 | Reactive power phase 1 (phase-to-neutral L1 – N) |
| Q2 | Reactive power phase 2 (phase-to-neutral L2 – N) |
| Q3 | Reactive power phase 3 (phase-to-neutral L3 – N) |
| S | Apparent power of the system $S = \sqrt{I_1^2 + I_2^2 + I_3^2} \cdot \sqrt{U_1^2 + U_2^2 + U_3^2}$ |
| S1 | Apparent power phase 1 (phase-to-neutral L1 – N) |
| S2 | Apparent power phase 2 (phase-to-neutral L2 – N) |
| S3 | Apparent power phase 3 (phase-to-neutral L3 – N) |
| Sr | Rated value of the apparent power of the system |
| PF | Active power factor $\cos\varphi = P/S$ |
| PF1 | Active power factor phase 1 P1/S1 |
| PF2 | Active power factor phase 2 P2/S2 |
| PF3 | Active power factor phase 3 P3/S3 |
| QF | Reactive power factor $\sin\varphi = Q/S$ |
| QF1 | Reactive power factor phase 1 Q1/S1 |
| QF2 | Reactive power factor phase 2 Q2/S2 |

| Symbols | Meaning |
|---|---|
| QF3 | Reactive power factor phase 3 Q3/S3 |
| LF | Power factor of the system<br>LF = sgnQ · (1 – \|PF\|) |
| LF1 | Power factor phase 1<br>sgnQ1 · (1 – \|PF1\|) |
| LF2 | Power factor phase 2<br>sgnQ2 · (1 – \|PF2\|) |
| LF3 | Power factor phase 3<br>sgnQ3 · (1 – \|PF3\|) |
| c | Factor for the intrinsic error |
| R | Output load |
| Rn | Rated burden |
| H | Power supply |
| Hn | Rated value of the power supply |
| CT | c.t. ratio |
| VT | v.t. ratio |

## Applicable standards and regulations

| | |
|---|---|
| EN 60 688 | Electrical measuring transducers for converting AC electrical variables into analog and digital signals |
| IEC 1010 or EN 61 010 | Safety regulations for electrical measuring, control and laboratory equipment |
| EN 60529 | Protection types by case (code IP) |
| IEC 255-4 Part E5 | High-frequency interference test (solid-state relays only) |
| IEC 1000-4-2, 3, 4, 6 | Electromagnetic compatibility for industrialprocess measurement and control equipment |
| VDI/VDE 3540, page 2 | Reliability of measuring and control equipment (classification of climates) |
| DIN 40 110 | AC quantities |
| DIN 43 807 | Terminal markings |
| IEC 68 /2-6 | Basic environmental testing procedures, vibration, sinusoidal |
| EN 55011 | Electromagnetic compatibility of data processing and telecommunication equipment |
| | Limits and measuring principles for radio interference and information equipment |
| IEC 1036 | Solid state AC watt hour meters for active power (classes 1 and 2) |
| DIN 43864 | Current interface for the transmission of impulses between impulse encoder counter and tarif meter |
| UL 94 | Tests for flammability of plastic materials for parts in devices and appliances |

## Technical data

### Inputs

| | |
|---|---|
| Input variables: | See Table 2, 3 and 4 |
| Measuring ranges: | See Table 2, 3 and 4 |
| Waveform: | Sinusoidal |
| Rated frequency: | 50…60 Hz; 16 2/3 Hz |
| Consumption: | Voltage circuit: ≤ $U^2$ / 400 kΩ<br>Condition:<br>external power supply<br>Current circuit: 0.3 VA · I/5 A |

**Continuous thermal ratings of inputs**

| | | |
|---|---|---|
| **Current circuit** | 10 A | 400 V<br>single-phase AC system<br>693 V three-phase system |
| **Voltage circuit** | 480 V<br>831 V | single-phase AC system<br>three-phase system |

**Short-time thermal rating of inputs**

| Input variable | Number of inputs | Duration of overload | Interval between two overloads |
|---|---|---|---|
| **Current circuit** | 400 V single-phase AC system<br>693 V three-phase system | | |
| 100 A | 5 | 3 s | 5 min. |
| 250 A | 1 | 1 s | 1 hour |
| **Voltage circuit** 1 A, 2 A, 5 A | | | |
| Single-phase AC system 600 V<br>$H_{intern}$: 1.5 Ur | 10 | 10 s | 10 s |
| Three-phase system 1040 V<br>$H_{intern}$: 1.5 Ur | 10 | 10 s | 10 s |

# SINEAX DME 424/442
# Programmable Multi-Transducers

### Analog outputs

For the outputs A, B, C and D:

| Output variable Y | | Impressed DC current | Impressed DC voltage |
|---|---|---|---|
| Full scale Y2 | | see “Ordering information” | see “Ordering information” |
| Limits of output signal for input overload | | | |
| and/or | R = 0 | 1.25 · Y2 | 40 mA |
| | R → ∞ | 30 V | 1.25 Y2 |
| Rated useful range of output load | | $0 \le \frac{7.5\ V}{Y2} \le \frac{15\ V}{Y2}$ | $\frac{Y2}{2\ mA} \le \frac{Y2}{1\ mA} \le \infty$ |
| AC component of output signal (peak-to-peak) | | ≤ 0.005 Y2 | ≤ 0.005 Y2 |

The outputs A, B, C and D may be either short or open-circuited. They are electrically insulated from each other and from all other circuits (floating).

All the full-scale output values can be reduced subsequently using the programming software, but a supplementary error results.

The hardware full-scale settings for the analog outputs may also be changed subsequently. Conversion of a current to a voltage output or vice versa is also possible. This necessitates changing resistors on the output board. The full-scale values of the current and voltage outputs are set by barying the effective value of two parallel resistors (better resolution). The values of the resistors are selected to achieve the minimum absolute error. Calibration with the programming software is always necessary following conversion of the outputs. Refer to the Operating Instructions. **Caution: The warranty is void if the device is tampered with!**

### Digital outputs, pulse outputs, limit outputs

The digital outputs conform to DIN 43 864. The pulse width can be neither programmed nor is there a hardware setting.

Type of contact: Open collector

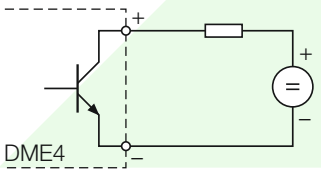
Number of pulse: see “Ordering information”

Pulse duration: ≥ 100 ms

Interval: ≥ 100 ms

Power supply: 8 … 40 V

Output current: ON 10 … 27 mA
OFF ≤ 2 mA




### Reference conditions

Ambient temperature: 15 … 30 °C

Pre-conditioning: 30 min. acc. to EN 60 688 Section 4.3, Table 2

Input variable: Rated useful range

Power supply: H = Hn ± 1%

Active/reactive factor: cosφ = 1 resp. sinφ = 1

Frequency: 50 … 60 Hz, 16 2/3 Hz

Waveform: Sinusoidal, form factor 1.1107

Output load: DC current output:

$$R_n = \frac{7.5\ V}{Y2} \pm 1\%$$

DC voltage output:

$$R_n = \frac{Y2}{1\ mA} \pm 1\%$$

Miscellaneous: EN 60 688

### System response

Accuracy class: (the reference value is the full-scale value Y2)

| Measured variable | Condition | Accuracy class* |
|---|---|---|
| **System:** Active, reactive and apparent power | 0.5 ≤ X2/Sr ≤ 1.5<br>0.3 ≤ X2/Sr < 0.5 | 0.25 c<br>0.5 c |
| **Phase:** Active, reactive and apparent power | 0.167 ≤ X2/Sr ≤ 0.5<br>0.1 ≤ X2/Sr < 0.167 | 0.25 c<br>0.5 c |
| Power factor, active power factor and reactive power factor | 0.5Sr ≤ S ≤ 1.5 Sr, (X2 - X0) = 2 | 0.25 c |
| | 0.5Sr ≤ S ≤ 1.5 Sr, 1 ≤ (X2 - X0) < 2 | 0.5 c |
| | 0.5Sr ≤ S ≤ 1.5 Sr, 0.5 ≤ (X2 - X0) < 1 | 1.0 c |
| | 0.1Sr ≤ S < 0.5 Sr, (X2 - X0) = 2 | 0.5 c |
| | 0.1Sr ≤ S < 0.5 Sr, 1 ≤ (X2 - X0) < 2 | 1.0 c |
| | 0.1Sr ≤ S < 0.5 Sr, 0.5 ≤ (X2 - X0) < 1 | 2.0 c |
| AC voltage | 0.1 Ur ≤ U ≤ 1.2 Ur | 0.2 c |
| AC current/ current averages | 0.1 Ir ≤ I ≤ 1.5 Ir | 0.2 c |
| System frequency | 0.1 Ur ≤ U ≤ 1.2 Ur resp. 0.1 Ir ≤ I ≤ 1.5 Ir | 0.15 + 0.03 c ($f_N$ = 50...60 Hz)<br>0.15 + 0,1 c ($f_N$ = 16 2/3 Hz) |
| Pulse Energy meter | acc. to IEC 1036 0.1 Ir ≤ I ≤ 1.5 Ir | 1.0 |

* Basic accuracy 0.5 c for applications with phase-shift

Duration of the measurement cycle: Approx. 0.25 to 0.5 s at 50 Hz, depending on measured variable and programming

Response time: 1 … 2 times the measurement cycle

Factor c (the highest value applies):

Linear characteristic: $c = \frac{1 - \frac{Y0}{Y2}}{1 - \frac{X0}{X2}}$ or c = 1

Bent characteristic:

$X0 \le X \le X1$ $c = \frac{Y1 - Y0}{X1 - X0} \cdot \frac{X2}{Y2}$ or c = 1

$X1 < X \le X2$ $c = \frac{1 - \frac{Y1}{Y2}}{1 - \frac{X1}{X2}}$ or c = 1

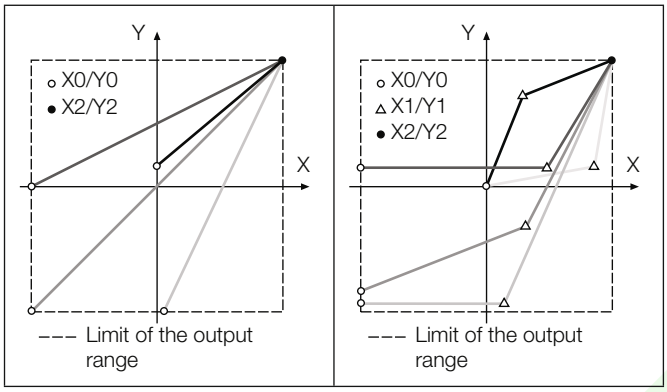



Fig. 3. Examples of settings with linear characteristic.




Fig. 4. Example of settings with bent characteristics.

## Influencing quantities and permissible variations

Acc. to EN 60 688

## Electrical safety

Protection class: II

Enclosure protection: IP40, housing
IP20, terminals

Installation category: III

Insulation test (versus earth):

| | |
|---|---|
| Input voltage: | CA 400 V |
| Input current: | CA 400 V |
| Output: | CC 40 V |
| Power supply: | CA 400 V<br>CC 230 V |

Surge test: 5 kV; 1.2/50 µs; 0.5 Ws

Test voltages: 50 Hz, 1 min. acc. to EN 61 010-1

5550 V, inputs versus all other circuits as well as outer surface

3250 V, input circuits versus each other

3700 V, power supply versus outputs and SCI as well as outer surface

490 V, outputs and SCI versus each other and versus outer surface

## Power supply →○

AC/DC power pack (DC and 50 … 60 Hz)

Table 1: Rated voltages and tolerances

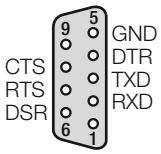
| Rated voltage $U_N$ | Tolerance |
|---|---|
| 24 … 60 V CC/CA | CC – 15 … + 33%<br>CA ± 10% |
| 85 … 230 V CC/CA | |

Consumption: ≤ 9 W resp. ≤ 10 VA

## Programming connector on transducer

Interface: RS 232 C

DSUB socket: 9-pin




The interface is electrically insulated from all other circuits.

## Installation data

Housing: Housing **T24**
See Section “Dimensioned drawings”

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

Mounting: For snapping onto top-hat rail (35 x 15 mm or 35 x 7.5 mm) acc. to EN 50 022
or
directly onto a wall or panel using the pull-out screw hole brackets

Orientation: Any

Weight: With supply transformer approx. 1.1 kg
With AC/DC power pack approx. 0.7 kg

## Terminals

Type: Screw terminals with wire guards

| | |
|---|---|
| Max. wire gauge: | ≤ 4.0 mm2 single wire or 2 x 2.5 mm2 fine wire |

**Vibration withstand**
(tested according to DIN EN 60 068-2-6)

| | |
|---|---|
| Acceleration: | ± 2 g |
| Frequency range: | 10 … 150 … 10 Hz, rate of frequency sweep: 1 octave/minute |
| Number of cycles: | 10 in each of the three axes |
| Result: | No faults occurred, no loss of accuracy and no problems with the snap fastener |

**Ambient conditions**

| | |
|---|---|
| Variations due to ambient temperature: | ± 0.1% / 10 K |
| Nominal range of use for temperature: | 0…15…30…45 °C (usage group II) |
| Operating temperature: | – 10 to + 55 °C |
| Storage temperature: | – 40 to + 85 °C |
| Annual mean relative humidity: | ≤ 75% |
| Altitude: | 2000 m max. |
| Indoor use statement! | |

## Table 2: Orderin information for SINEAX DME 424 with 2 analog and 4 digital outputs

| DESCRIPTION | | | MARKING |
|---|---|---|---|
| **1. Mechanical design** | | | |
| Housing T24 for rail and wall mounting | | | 424 – 1 |
| **2. Rated frequency** | | | |
| 50 Hz (60 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 · c) | | | 1 |
| 60 Hz (50 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 · c) | | | 2 |
| 16 2/3 Hz (not re-programming by user, 50/60 Hz possible, but with additional error 1.25 · c) | | | 3 |
| **3. Power supply** | | | |
| DC/AC 24 … 60 V, CSA approved | | | 7 |
| DC/AC 85 … 230 V, CSA approved | | | 8 |
| **4. Power supply connection** | | | |
| External (standard) | | | 1 |
| External or internal from voltage input (not allowed for CSA)<br>Not available for rated frequency 16 2/3 Hz and applications A15 / A16 / A24 (see Table 4) | | | 2 |
| Caution: The power supply voltage must agree with the input voltage (Table 4)! | | | |
| **5. Full-scale output signal, output A** | | | |
| Output A, Y2 = 20 mA (standard) | | | 1 |
| Output A, Y2 (full-scale current Y2 [mA] 1 to 20) | [mA] | | 9 |
| Output A, Y2 (full-scale voltage Y2 [V] 1 to 10) | [V] | | Z |
| **6. Full-scale output signal, output B** | | | |
| Output B, Y2 = 20 mA (standard) | | | 1 |
| Output B, Y2 (full-scale current Y2 [mA] 1 to 20) | [mA] | | 9 |
| Output B, Y2 (full-scale voltage Y2 [V] 1 to 10) | [V] | | Z |
| **7. Test certificate** | | | |
| None supplied | | | 0 |
| Supplied | | | 1 |
| **8. Programming** | | | |
| Basic (not available if the power supply is taken from the voltage input) | | | 0 |
| According to specification | | | 9 |
| **All the programming data must be entered on Form W 2386e (see appendix 1) and the form must be included with the order!** | | | |

## Table 3: Ordering information for SINEAX DME 442 with 4 analog and 2 digital outputs

| DESCRIPTION | | | MARKING |
|---|---|---|---|
| **1. Mechanical design** | | | |
| Housing T24 for rail and wall mounting | | | 442 – 1 |
| **2. Rated frequency** | | | |
| 50 Hz (60 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 · c) | | | 1 |
| 60 Hz (50 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 · c) | | | 2 |
| 16 2/3 Hz (not re-programming by user, 50/60 Hz possible, but with additional error 1.25 · c) | | | 3 |
| **3. Power supply** | | | |
| DC/AC 24 … 60 V, CSA approved | | | 7 |
| DC/AC 85 … 230 V, CSA approved | | | 8 |
| **4. Power supply connection** | | | |
| External (standard) | | | 1 |
| iInternal from voltage input (not allowed for CSA)<br>(not available for rated frequency 16 2/3 Hz and applications A15 / A16 / A24 (see Table 4) | | | 2 |
| Caution: The power supply voltage must agree with the input voltage (Table 4)! | | | |
| **5. Full-scale output signal, output A** | | | |
| Output A, Y2 = 20 mA (standard) | | | 1 |
| Output A, Y2 (full-scale current Y2 [mA] 1 to 20) | [mA] | | 9 |
| Output A, Y2 (full-scale voltage Y2 [V] 1 to 10) | [V] | | Z |
| **6. Full-scale output signal, output B** | | | |
| Output B, Y2 = 20 mA (standard) | | | 1 |
| Output B, Y2 (full-scale current Y2 [mA] 1 to 20) | [mA] | | 9 |
| Output B, Y2 (full-scale voltage Y2 [V] 1 to 10) | [V] | | Z |
| **7. Full-scale output signal, output C** | | | |
| Output C, Y2 = 20 mA (standard) | | | 1 |
| Output C, Y2 (full-scale current Y2 [mA] 1 to 20) | [mA] | | 9 |
| Output C, Y2 (full-scale voltage Y2 [V] 1 to 10) | [V] | | Z |
| **8. Full-scale output signal, output D** | | | |
| Output D, Y2 = 20 mA (standard) | | | 1 |
| Output D, Y2 (full-scale current Y2 [mA] 1 to 20) | [mA] | | 9 |
| Output D, Y2 (full-scale voltage Y2 [V] 1 to 10) | [V] | | Z |
| **9. Test certificate** | | | |
| None supplied | | | 0 |
| Supplied | | | 1 |
| **10. Programming** | | | |
| Basic (not available if the power supply is taken from the voltage input) | | | 0 |
| According to specification | | | 9 |
| **All the programming data must be entered on W 2387e (see appendix 2) and the form must be included with the order !** | | | |

# SINEAX DME 424/442
# Programmable Multi-Transducers

## Table 4: Programming for types DME 424 and 442

| DESCRIPTION | Application | | |
|---|---|---|---|
| | A11… A16 | A34 | A24/A44 |
| **1. Application** (system) | | | |
| Single-phase AC | A11 | — | — |
| 3-wire, 3-phase symmetric load, phase-shift U: L1-L2, I: L1* | A12 | — | — |
| 3-wire, 3-phase symmetric load | A13 | — | — |
| 4-wire, 3-phase symmetric load | A14 | — | — |
| 3-wire, 3-phase symmetric load, phase-shift U: L3-L1, I: L1* | A15 | — | — |
| 3-wire, 3-phase symmetric load, phase-shift U: L2-L3, I: L1* | A16 | — | — |
| 3-wire, 3-phase asymmetric load | — | A34 | — |
| 4-wire, 3-phase asymmetric load | — | — | A44 |
| 4-wire, 3-phase asymmetric load, open Y | — | — | A24 |
| **2. Input voltage** | | | |
| Rated value Ur = 57.7 V | U01 | — | — |
| Rated value Ur = 63.5 V | U02 | — | — |
| Rated value Ur = 100 V | U03 | — | — |
| Rated value Ur = 110 V | U04 | — | — |
| Rated value Ur = 120 V | U05 | — | — |
| Rated value Ur = 230 V | U06 | — | — |
| Rated value Ur (Ur [V] 57 to 400) [V] | U91 | — | — |
| Rated value Ur = 100 V | U21 | U21 | U21 |
| Rated value Ur = 110 V | U22 | U22 | U22 |
| Rated value Ur = 115 V | U23 | U23 | U23 |
| Rated value Ur = 120 V | U24 | U24 | U24 |
| Rated value Ur = 400 V | U25 | U25 | U25 |
| Rated value Ur = 500 V | U26 | U26 | U26 |
| Rated value Ur (Ur [V] > 100 to 693) [V] | U93 | U93 | U93 |
| Lines U01 to U06: Only for single phase AC current or 4-wire, 3-phase symmetric load | | | |
| **3. Input current** | | | |
| Rated value Ir = 1 A | V1 | V1 | V1 |
| Rated value Ir = 2 A | V2 | V2 | V2 |
| Rated value Ir = 5 A | V3 | V3 | V3 |
| Rated value Ir (Ir [A] > 1 to 6) [A] | V9 | V9 | V9 |
| **4. Primary rating** (primary transformer) | | | |
| Without specification of primary rating | W0 | W0 | W0 |
| CT = _____ A / _____ A VT = _____kV / _____ V<br>Specify transformer ratio prim./sec. 1000/5 A; 33 kV/110 V | W9 | W9 | W9 |
| **5. Measured variable, output A** | | | |
| Not used | AA000 | AA000 | AA000 |
| Initial value X0 / Final value X2 | | | |
| U System X0 = 0 / X2 = Ur* | AA001 | — | — |
| U12 L1-L2 X0 = 0 / X2 = Ur* | — | AA001 | AA001 |
| U System $0 \le X0 \le 0.9 \cdot X2$ / $0.8 \cdot Ur \le X2 \le 1.2 \cdot Ur$* | AA901 | — | — |
| U1N L1-N $0 \le X0 \le 0.9 \cdot X2$ / $0.8 \cdot Ur / \sqrt{3} \le X2 \le 1.2 \cdot Ur / \sqrt{3}$* | — | — | AA902 |

| DESCRIPTION | | | | | Application | | |
|---|---|---|---|---|---|---|---|
| | | | | | A11… A16 | A34 | A24/A44 |
| **5. Measured variable, output A (continuation)** | | | | | | | |
| | | Initial value X0 | | Final value X2 | | | |
| U2N | L2-N | 0 ≤ X0 ≤ 0.9 · X2 | | 0.8 · Ur / $\sqrt{3}$ ≤ X2 ≤ 1.2 · Ur / $\sqrt{3}$ * | — | — | AA903 |
| U3N | L3-N | 0 ≤ X0 ≤ 0.9 · X2 | | 0.8 · Ur / $\sqrt{3}$ ≤ X2 ≤ 1.2 · Ur / $\sqrt{3}$ * | — | — | AA904 |
| U12 | L1-L2 | 0 ≤ X0 ≤ 0.9 · X2 | | 0.8 · Ur ≤ X2 ≤ 1.2 · Ur* | — | AA905 | AA905 |
| U23 | L2-L3 | 0 ≤ X0 ≤ 0.9 · X2 | | 0.8 · Ur ≤ X2 ≤ 1.2 · Ur* | — | AA906 | AA906 |
| U31 | L3-L1 | 0 ≤ X0 ≤ 0.9 · X2 | | 0.8 · Ur ≤ X2 ≤ 1.2 · Ur* | — | AA907 | AA907 |
| I | System | 0 ≤ X0 ≤ 0.8 · X2 | | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | AA908 | — | — |
| I1 | L1 | 0 ≤ X0 ≤ 0.8 · X2 | | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA909 | AA909 |
| I2 | L2 | 0 ≤ X0 ≤ 0.8 · X2 | | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA910 | AA910 |
| I3 | L3 | 0 ≤ X0 ≤ 0.8 · X2 | | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA911 | AA911 |
| P | System | – X2 ≤ X0 ≤ 0.8 · X2 | | 0.3 · X2 / Sr ≤ 1.5 | AA912 | AA912 | AA912 |
| P1 | L1 | – X2 ≤ X0 ≤ 0.8 · X2 | | 0.1 · X2 / Sr ≤ 0.5 | — | — | AA913 |
| P2 | L2 | – X2 ≤ X0 ≤ 0.8 · X2 | | 0.1 · X2 / Sr ≤ 0.5 | — | — | AA914 |
| P3 | L3 | – X2 ≤ X0 ≤ 0.8 · X2 | | 0.1 · X2 / Sr ≤ 0.5 | — | — | AA915 |
| Q | System | – X2 ≤ X0 ≤ 0.8 · X2 | | 0.3 · X2 / Sr ≤ 1.5 | AA916 | AA916 | AA916 |
| Q1 | L1 | – X2 ≤ X0 ≤ 0.8 · X2 | | 0.1 · X2 / Sr ≤ 0.5 | — | — | AA917 |
| Q1 | L2 | – X2 ≤ X0 ≤ 0.8 · X2 | | 0.1 · X2 / Sr ≤ 0.5 | — | — | AA918 |
| Q3 | L3 | – X2 ≤ X0 ≤ 0.8 · X2 | | 0.1 · X2 / Sr ≤ 0.5 | — | — | AA919 |
| PF | System | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | AA920 | AA920 | AA920 |
| PF1 | L1 | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | — | — | AA921 |
| PF2 | L2 | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | — | — | AA922 |
| PF3 | L3 | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | — | — | AA923 |
| QF | System | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | AA924 | AA924 | AA924 |
| QF1 | L1 | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | — | — | AA925 |
| QF2 | L2 | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | — | — | AA926 |
| QF3 | L3 | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | — | — | AA927 |
| F | | 15.3 Hz ≤ X0 ≤ X2 – 1 Hz | | X0 + 1 Hz ≤ X2 ≤ 65 Hz | AA928 | AA928 | AA928 |
| S | System | 0 ≤ X0 ≤ 0.8 · X2 | | 0.3 ≤ X2 / Sr ≤ 1.5 | AA929 | AA929 | AA929 |
| S1 | L1 | 0 ≤ X0 ≤ 0.8 · X2 | | 0.1 ≤ X2 / Sr ≤ 0.5 | — | — | AA930 |
| S2 | L2 | 0 ≤ X0 ≤ 0.8 · X2 | | 0.1 ≤ X2 / Sr ≤ 0.5 | — | — | AA931 |
| S3 | L3 | 0 ≤ X0 ≤ 0.8 · X2 | | 0.1 ≤ X2 / Sr ≤ 0.5 | — | — | AA932 |
| IM | System | 0 ≤ X0 ≤ 0.8 · X2 | | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA933 | AA933 |
| IMS | System | – X2 ≤ X0 ≤ 0.8 · X2 | | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA934 | AA934 |
| LF | System | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | AA935 | AA935 | AA935 |
| LF1 | L1 | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | — | — | AA936 |
| LF2 | L2 | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | — | — | AA937 |
| LF3 | L3 | – 1 ≤ X0 ≤ (X2 – 0.5) | | 0 ≤ X2 ≤ 1 | — | — | AA938 |
| IB | System | X0 = 0 | 1 ≤ IBT ≤ 30 min | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | AA939 | — | — |
| IB1 | L1 | X0 = 0 | 1 ≤ IBT ≤ 30 min | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA940 | AA940 |
| IB2 | L2 | X0 = 0 | 1 ≤ IBT ≤ 30 min | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA941 | AA941 |
| IB3 | L3 | X0 = 0 | 1 ≤ IBT ≤ 30 min | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA942 | AA942 |
| BS | System | X0 = 0 | 1 ≤ BST ≤ 30 min | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | AA943 | — | — |
| BS1 | L1 | X0 = 0 | 1 ≤ BST ≤ 30 min | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA944 | AA944 |
| BS2 | L2 | X0 = 0 | 1 ≤ BST ≤ 30 min | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA945 | AA945 |
| BS3 | L3 | X0 = 0 | 1 ≤ BST ≤ 30 min | 0.5 · Ir ≤ X2 ≤ 1.5 · Ir | — | AA946 | AA946 |
| UM | System | 0 ≤ X0 ≤ 0.8 · X2 | | 0.8 · Ur / $\sqrt{3}$ ≤ X2 ≤ 1.2 · Ur / $\sqrt{3}$ * | — | — | AA947 |

** Where the power supply is taken from the measured voltage, the transmitter only operates in the range U = 0.8 Ur … 1.2 Ur and the specified accuracy is only guaranteed in the range U = 0.9 Ur … 1.1 Ur.*

# SINEAX DME 424/442
# Programmable Multi-Transducers

| DESCRIPTION | | | | Application | | |
|---|---|---|---|---|---|---|
| | | | | A11… A16 | A34 | A24/A44 |
| **6. Output signal, output A** | | | | | | |
| | Initial value Y0 | | Final value Y2 | | | |
| DC current | Y0 = 0 | | Y2 = 20 mA | AB01 | AB01 | AB01 |
| | – Y2 ≤ Y0 ≤ 0.2 · Y2 | | 1 mA ≤ Y2 ≤ 20 mA | AB91 | AB91 | AB91 |
| DC voltage | – Y2 ≤ Y0 ≤ 0.2 · Y2 | | 1 V ≤ Y2 ≤ 10 V | AB92 | AB92 | AB92 |
| **7. Characteristic, output A** | | | | | | |
| Linear | | | | AC01 | AC01 | AC01 |
| Bent | (X0 + 0.015 · X2) | ≤ X1 ≤ 0.985 · X2 | Y0 ≤ Y1 ≤ Y2 | AC91 | AC91 | AC91 |
| **8. Limits, output A** | | | | | | |
| Standard | Ymin = Y0 – 0.25 Y2 | | Ymax = 1.25 Y2 | AD01 | AD01 | AD01 |
| | (Y0 – 0.25 Y2) ≤ Ymin ≤ Y0 | | Y2 ≤ Ymax ≤ 1.25 Y2 | AD91 | AD91 | AD91 |
| **9. Measured variable, output B** | | | | | | |
| Same as output A, but markings start with a capital B | | | | BA ... | BA ... | BA ... |
| **10. Output signal, output B** | | | | | | |
| Same as output A, but markings start with a capital B | | | | BB .. | BB .. | BB .. |
| **11. Characteristic, output B** | | | | | | |
| Same as output A, but markings start with a capital B | | | | BC .. | BC .. | BC .. |
| **12. Limits, output B** | | | | | | |
| Same as output A, but markings start with a capital B | | | | BD .. | BD .. | BD .. |
| **Only for type DME 442** | | | | | | |
| **13. Measured variable, output C** | | | | | | |
| Same as output A, but markings start with a capital C | | | | CA ... | CA ... | CA ... |
| **14. Output signal, output C** | | | | | | |
| Same as output A, but markings start with a capital C | | | | CB .. | CB .. | CB .. |
| **15. Characteristic, output C** | | | | | | |
| Same as output A, but markings start with a capital C | | | | CC .. | CC .. | CC .. |
| **16. Limits, output C** | | | | | | |
| Same as output A, but markings start with a capital C | | | | CD .. | CD .. | CD .. |
| **17. Measured variable, output D** | | | | | | |
| Same as output A, but markings start with a capital D | | | | DA .. | DA .. | DA .. |
| **18. Output signal, output D** | | | | | | |
| Same as output A, but markings start with a capital D | | | | DB .. | DB .. | DB .. |
| **19. Characteristic, output D** | | | | | | |
| Same as output A, but markings start with a capital D | | | | DC .. | DC .. | DC .. |
| **20. Limits, output D** | | | | | | |
| Same as output A, but markings start with a capital D | | | | DD .. | DD .. | DD .. |

| DESCRIPTION | | | | Application A11… A16 | A34 | A24/A44 |
|---|---|---|---|---|---|---|
| **Only for type DME 424** | | | | | | |
| **21. Measured variable, output E** | | | | | | |
| Not used | | | | EA000 | EA000 | EA000 |
| Pulse | X0 = 0 | Y0 = 0 | | | | |
| I | System | 0.1 ≤ Xi ≤ (4800 · 1 A / Ir) | [Imp/Ah] | EA950 | — | — |
| I1 | L1 | 0.1 ≤ Xi ≤ (4800 · 1 A / Ir) | [Imp/Ah] | — | EA951 | EA951 |
| I2 | L2 | 0.1 ≤ Xi ≤ (4800 · 1 A / Ir) | [Imp/Ah] | — | EA952 | EA952 |
| I3 | L3 | 0.1 ≤ Xi ≤ (4800 · 1 A / Ir) | [Imp/Ah] | — | EA953 | EA953 |
| S | System | 0.1 ≤ Xi ≤ (4000 · 1 kVA / Sr) | [Imp/kVAh] | EA954 | EA954 | EA954 |
| S1 | L1 | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kVAh] | — | — | EA955 |
| S2 | L2 | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kVAh] | — | — | EA956 |
| S3 | L3 | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kVAh] | — | — | EA957 |
| P | System (incoming) | 0.1 ≤ Xi ≤ (4000 · 1 kVA / Sr) | [Imp/kWh] | EA958 | EA958 | EA958 |
| P1 | L1 (incoming) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kWh] | — | — | EA959 |
| P2 | L2 (incoming) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kWh] | — | — | EA960 |
| P3 | L3 (incoming) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kWh] | — | — | EA961 |
| Q | System (inductive) | 0.1 ≤ Xi ≤ (4000 · 1 kVA / Sr) | [Imp/kvarh] | EA962 | EA962 | EA962 |
| Q1 | L1 (inductive) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kvarh] | — | — | EA963 |
| Q2 | L2 (inductive) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kvarh] | — | — | EA964 |
| Q3 | L3 (inductive) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kvarh] | — | — | EA965 |
| P | System (outgoing) | 0.1 ≤ Xi ≤ (4000 · 1 kVA / Sr) | [Imp/kWh] | EA966 | EA966 | EA966 |
| P1 | L1 (outgoing) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kWh] | — | — | EA967 |
| P2 | L2 (outgoing) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kWh] | — | — | EA968 |
| P3 | L3 (outgoing) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kWh] | — | — | EA969 |
| Q | System (capacitive) | 0.1 ≤ Xi ≤ (4000 · 1 kVA / Sr) | [Imp/kvarh] | EA970 | EA970 | EA970 |
| Q1 | L1 (capacitive) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kvarh] | — | — | EA971 |
| Q2 | L2 (capacitive) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kvarh] | — | — | EA972 |
| Q3 | L3 (capacitive) | 0.3 ≤ Xi ≤ (12000 · 1 kVA / Sr) | [Imp/kvarh] | — | — | EA973 |
| **Limit contact I** | | | | | | |
| Limit value XI | | | | | | |
| U | System | 0 ≤ XI ≤ 1.2 · Ur | | EA901 | — | — |
| U1N | L1-N | 0 ≤ XI ≤ 1.2 · Ur / $\sqrt{3}$ | | — | — | EA902 |
| U2N | L2-N | 0 ≤ XI ≤ 1.2 · Ur / $\sqrt{3}$ | | — | — | EA903 |
| U3N | L3-N | 0 ≤ XI ≤ 1.2 · Ur / $\sqrt{3}$ | | — | — | EA904 |
| U12 | L1-L2 | 0 ≤ XI ≤ 1.2 · Ur | | — | EA905 | EA905 |
| U23 | L2-L3 | 0 ≤ XI ≤ 1.2 · Ur | | — | EA906 | EA906 |
| U31 | L3-L1 | 0 ≤ XI ≤ 1.2 · Ur | | — | EA907 | EA907 |
| I | System | 0 ≤ XI ≤ 1.5 · Ir | | EA908 | — | — |
| I1 | L1 | 0 ≤ XI ≤ 1.5 · Ir | | — | EA909 | EA909 |
| I2 | L2 | 0 ≤ XI ≤ 1.5 · Ir | | — | EA910 | EA910 |
| I3 | L3 | 0 ≤ XI ≤ 1.5 · Ir | | — | EA911 | EA911 |
| P | System | – 1.5 ≤ XI / SR ≤ 1.5 | | EA912 | EA912 | EA912 |
| P1 | L1 | – 0.5 ≤ XI / SR ≤ 0.5 | | — | — | EA913 |
| P2 | L2 | – 0.5 ≤ XI / SR ≤ 0.5 | | — | — | EA914 |
| P3 | L3 | – 0.5 ≤ XI / SR ≤ 0.5 | | — | — | EA915 |
| Q | System | – 1.5 ≤ XI / SR ≤ 1.5 | | EA916 | EA916 | EA916 |
| Q1 | L1 | – 0.5 ≤ XI / SR ≤ 0.5 | | — | — | EA917 |
| Q2 | L2 | – 0.5 ≤ XI / SR ≤ 0.5 | | — | — | EA918 |
| Q3 | L3 | – 0.5 ≤ XI / SR ≤ 0.5 | | — | — | EA919 |

# SINEAX DME 424/442
# Programmable Multi-Transducers

| DESCRIPTION | | | | Application | | |
|---|---|---|---|---|---|---|
| | | | | A11… A16 | A34 | A24/A44 |
| **Limit contact I** (continuation) | | | | | | |
| Limit value XI | | | | | | |
| PF | System | – 1 ≤ XI ≤ 1 | | EA920 | EA920 | EA920 |
| PF1 | L1 | – 1 ≤ XI ≤ 1 | | — | — | EA921 |
| PF2 | L2 | – 1 ≤ XI ≤ 1 | | — | — | EA922 |
| PF3 | L3 | – 1 ≤ XI ≤ 1 | | — | — | EA923 |
| QF | System | – 1 ≤ XI ≤ 1 | | EA924 | EA924 | EA924 |
| QF1 | L1 | – 1 ≤ XI ≤ 1 | | — | — | EA925 |
| QF2 | L2 | – 1 ≤ XI ≤ 1 | | — | — | EA926 |
| QF3 | L3 | – 1 ≤ XI ≤ 1 | | — | — | EA927 |
| F | | 15.3 Hz ≤ XI ≤ 65 Hz | | EA928 | EA928 | EA928 |
| S | System | 0 ≤ XI / Sr ≤ 1.5 | | EA929 | EA929 | EA929 |
| S1 | L1 | 0 ≤ XI / Sr ≤ 0.5 | | — | — | EA930 |
| S2 | L2 | 0 ≤ XI / Sr ≤ 0.5 | | — | — | EA931 |
| S3 | L2 | 0 ≤ XI / Sr ≤ 0.5 | | — | — | EA932 |
| IM | System | 0 ≤ XI / Ir ≤ 1.5 | | — | EA933 | EA933 |
| IMS | System | – 1.5 ≤ XI / Ir ≤ 1.5 | | — | EA934 | EA934 |
| LF | System | – 1 ≤ XI ≤ 1 | | EA935 | EA935 | EA935 |
| LF1 | L1 | – 1 ≤ XI ≤ 1 | | — | — | EA936 |
| LF2 | L2 | – 1 ≤ XI ≤ 1 | | — | — | EA937 |
| LF3 | L3 | – 1 ≤ XI ≤ 1 | | — | — | EA938 |
| IB | System | 1 ≤ IBT ≤ 30 min | 0 ≤ XI / Ir ≤ 1.5 | EA939 | — | — |
| IB1 | L1 | 1 ≤ IBT ≤ 30 min | 0 ≤ XI / Ir ≤ 1.5 | — | EA940 | EA940 |
| IB2 | L2 | 1 ≤ IBT ≤ 30 min | 0 ≤ XI / Ir ≤ 1.5 | — | EA941 | EA941 |
| IB3 | L3 | 1 ≤ IBT ≤ 30 min | 0 ≤ XI / Ir ≤ 1.5 | — | EA942 | EA942 |
| BS | System | 1 ≤ BST ≤ 30 min | 0 ≤ XI / Ir ≤ 1.5 | EA943 | — | — |
| BS1 | L1 | 1 ≤ BST ≤ 30 min | 0 ≤ XI / Ir ≤ 1.5 | — | EA944 | EA944 |
| BS2 | L2 | 1 ≤ BST ≤ 30 min | 0 ≤ XI / Ir ≤ 1.5 | — | EA945 | EA945 |
| BS3 | L3 | 1 ≤ BST ≤ 30 min | 0 ≤ XI / Ir ≤ 1.5 | — | EA946 | EA946 |
| UM | System | 0 ≤ X1 ≤ 1.2 · Ur | | — | — | EA947 |
| **22. Output signal, output E** (only for EA901 … EA947) | | | | | | |
| ON if X1 > X1 | | | OFF if X1 < X1 | EB01 | EB01 | EB01 |
| X1 < X1 | | | X1 > X1 | EB02 | EB02 | EB02 |
| **23. Pick-up delay, output E** (only for EA901 … EA947) | | | | | | |
| Minimum | | | | EC01 | EC01 | EC01 |
| 1 ≤ Y Del ≤ 30 s | | | | EC91 | EC91 | EC91 |
| **Only for type DME 424** | | | | | | |
| **24. Measured variable, output F** | | | | | | |
| Same as output E, but markings start with a capital F | | | | FA .. | FA .. | FA .. |
| **25. Output signal, output F** | | | | | | |
| Same as output E, but markings start with a capital F | | | | FB .. | FB .. | FB .. |
| **26. Pick-up delay, output F** | | | | | | |
| Same as output E, but markings start with a capital F | | | | FC .. | FC .. | FC .. |
| **For types DME 424 and 442** | | | | | | |
| **27. Measured variable, output G** | | | | | | |
| Same as output E, but markings start with a capital G | | | | GA .. | GA .. | GA .. |
| **28. Output signal, output G** | | | | | | |
| Same as output E, but markings start with a capital G | | | | GB .. | GB .. | GB .. |

| DESCRIPTION | Application | | |
|---|---|---|---|
| | A11… A16 | A34 | A24/A44 |
| **29. Pick-up delay, output G** | | | |
| Same as output E, but markings start with a capital G | GC .. | GC .. | GC .. |
| **For types DME 424 and 442** | | | |
| **30. Measured variable, output H** | | | |
| Same as output E, but markings start with a capital H | HA .. | HA .. | HA .. |
| **31. Output signal, output H** | | | |
| Same as output E, but markings start with a capital H | HB .. | HB .. | HB .. |
| **32. Pick-up delay, output H** | | | |
| Same as output E, but markings start with a capital H | HC .. | HC .. | HC .. |

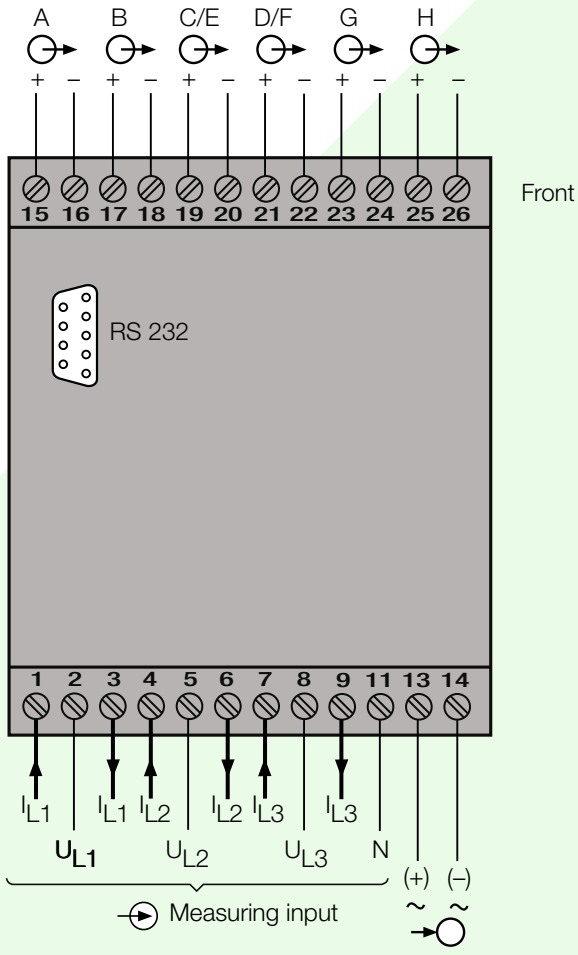
Note: Up to three limite can be assigned to digital outputs G and H using the programming software.

## Electrical connections

| Function | | | Connection |
|---|---|---|---|
| Measuring input | | | |
| AC current | | IL1 | 1 / 3 |
| | | IL2 | 4 / 6 |
| | | IL3 | 7 / 9 |
| AC voltage | | UL1 | 2 |
| | | UL2 | 5 |
| | | UL3 | 8 |
| | | N | 11 |
| Outputs | | | |
| Analog | Digital | | |
| A | | + | 15 |
| | | – | 16 |
| B | | + | 17 |
| | | – | 18 |
| C | E | + | 19 |
| | | – | 20 |
| D | F | + | 21 |
| | | – | 22 |
| | G | + | 23 |
| | | – | 24 |
| | H | + | 25 |
| | | – | 26 |
| Power supply | | | |
| | AC | ~ | 13 |
| | | ~ | 14 |
| | DC | + | 13 |
| | | – | 14 |

If power supply is taken from the measured voltage internal connections are as follow:

| Application (system) | Internal connection Terminal / System |
|---|---|
| Single phase AC current | 2 / 11 (L1 – N) |
| 4-wire 3-phase symmetric load | 2 / 11 (L1 – N) |
| All other (apart from A15 / A16 / A24) | 2 / 5 (L1 – L2) |



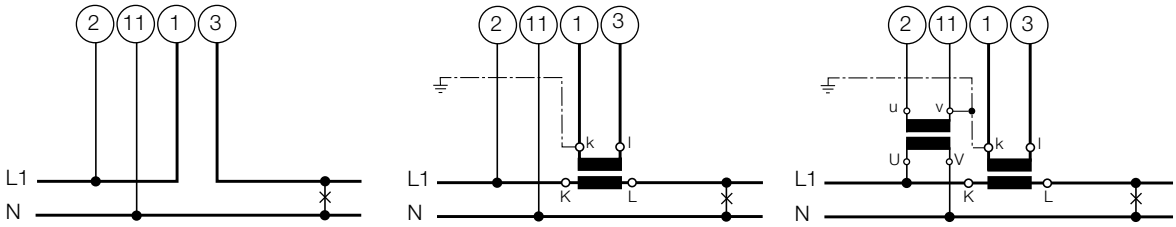
# SINEAX DME 424/442
# Programmable Multi-Transducers

**Measuring input**

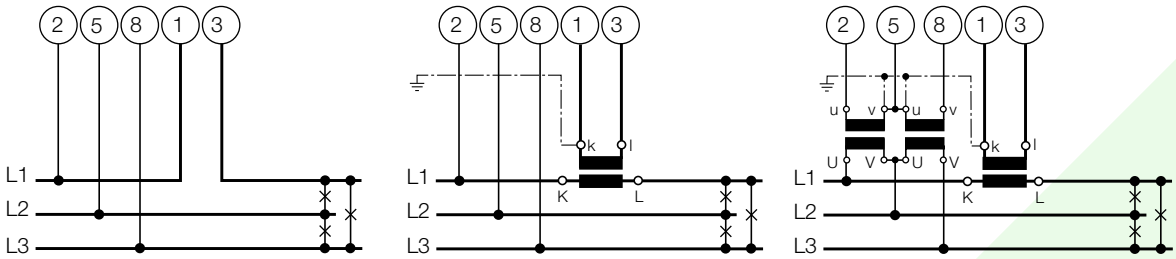
System/ application

Terminals

**Single-phase** AC system



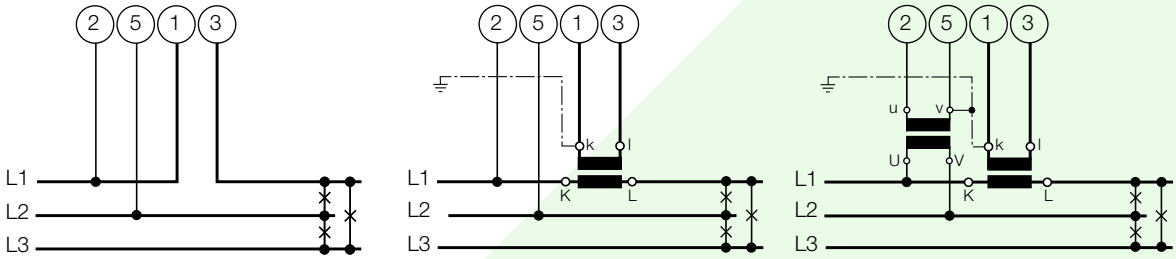

**3-wire** 3-phase **symmetric load** **I: L1**




Connect the voltage according to the following table for current measurement in L2 or L3:

| Current transformer | Terminals | | 2 | 5 | 8 |
|---|---|---|---|---|---|
| L2 | 1 | 3 | L2 | L3 | L1 |
| L3 | 1 | 3 | L3 | L1 | L2 |

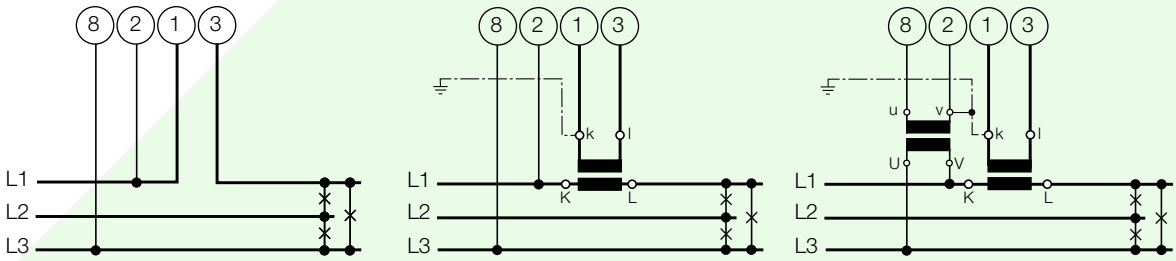
**3-wire** 3-phase **symmetric load** Phase-shift U: L1 – L2 I: L1




Connect the voltage according to the following table for current measurement in L2 or L3:

| Current transformer | Terminals | | 2 | 5 |
|---|---|---|---|---|
| L2 | 1 | 3 | L2 | L3 |
| L3 | 1 | 3 | L3 | L1 |

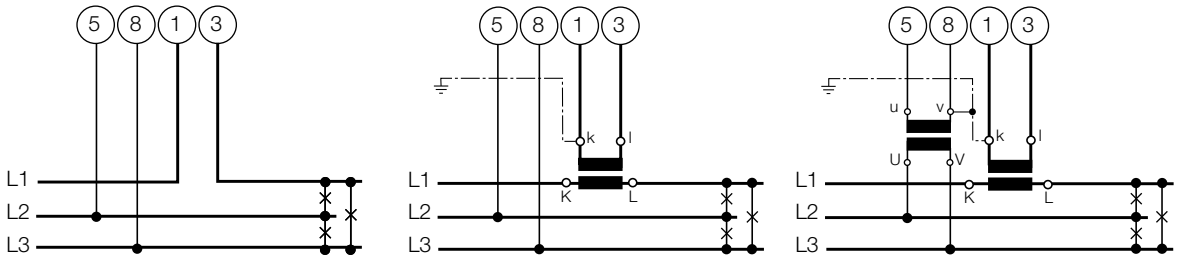
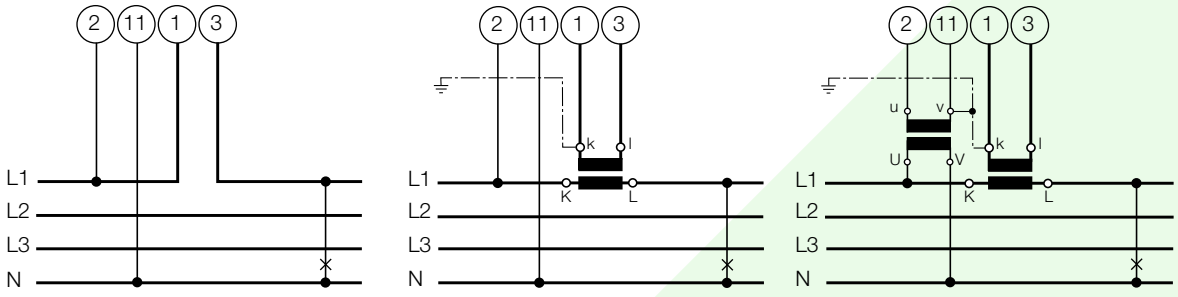
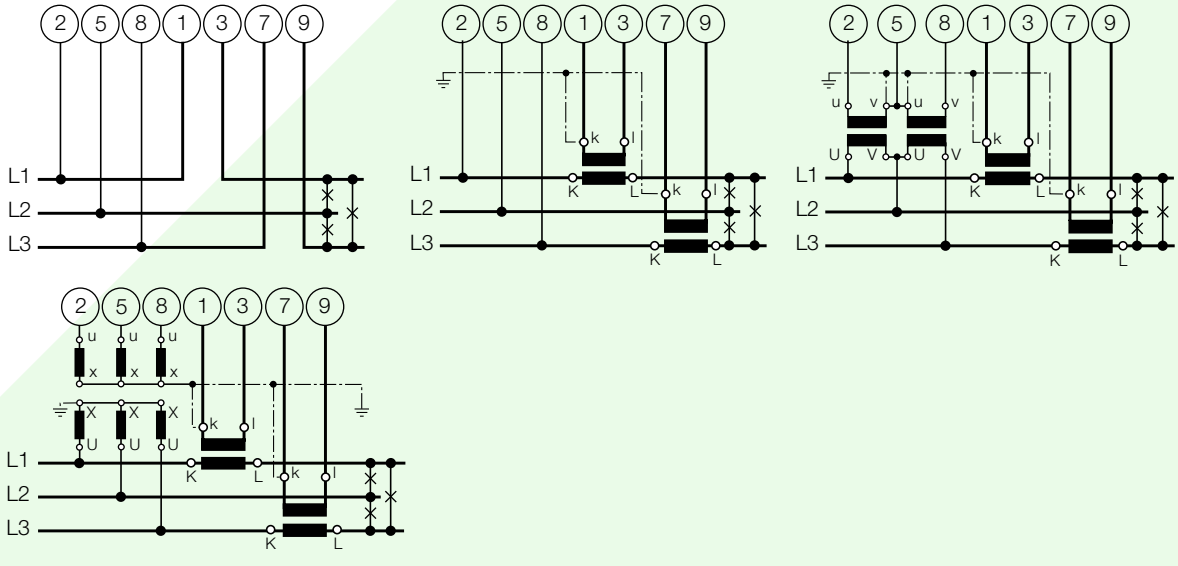
**3-wire** 3-phase **symmetric load** Phase-shift U: L3 – L1 I: L1




Connect the voltage according to the following table for current measurement in L2 or L3:

| Current transformer | Terminals | | 8 | 2 |
|---|---|---|---|---|
| L2 | 1 | 3 | L1 | L2 |
| L3 | 1 | 3 | L2 | L3 |

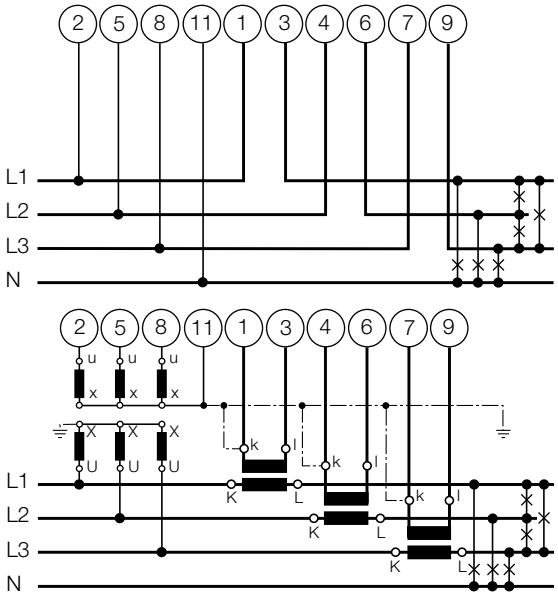
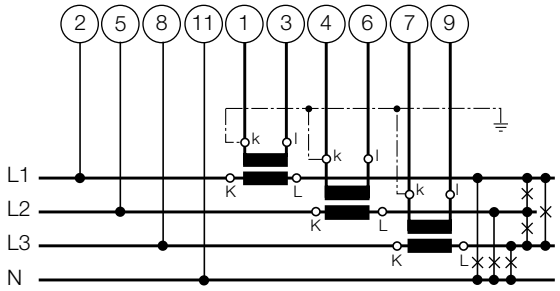
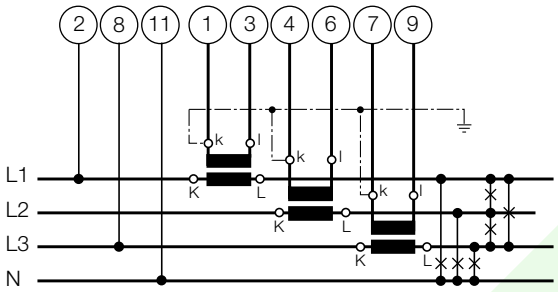
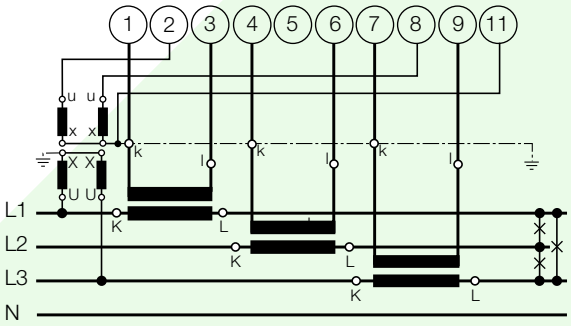
**Measuring input**

| System / application | Terminals |
|---|---|
| **3-wire** 3-phase **symmetric load** Phase-shift U: L2 – L3 I: L1 |   Connect the voltage according to the following table for current measurement in L2 or L3: |
| **4-wire** 3-phase **symmetric load** **I: L1** |   Connect the voltage according to the following table for current measurement in L2 or L3: |
| **3-wire** 3-phase **asymmetric load** |   |

| Current transformer | Terminals | | 5 | 8 |
|---|---|---|---|---|
| L2 | 1 | 3 | L3 | L1 |
| L3 | 1 | 3 | L1 | L2 |

| Current transformer | Terminals | | 2 | 11 |
|---|---|---|---|---|
| L2 | 1 | 3 | L2 | N |
| L3 | 1 | 3 | L3 | N |

# SINEAX DME 424/442
# Programmable Multi-Transducers

| Measuring inputs | |
|---|---|
| System / application | Terminals |
| **4-wire** 3-phase **asymmetric load** |    3 single-pole insulated voltage transformers in high-voltage system |
| **4-wire** 3-phase **asymmetric load,** Open Y connection |  Low-voltage system  2 single-pole insulated voltage transformers in high-voltage system |

**Relationship between PF, QF and LF**

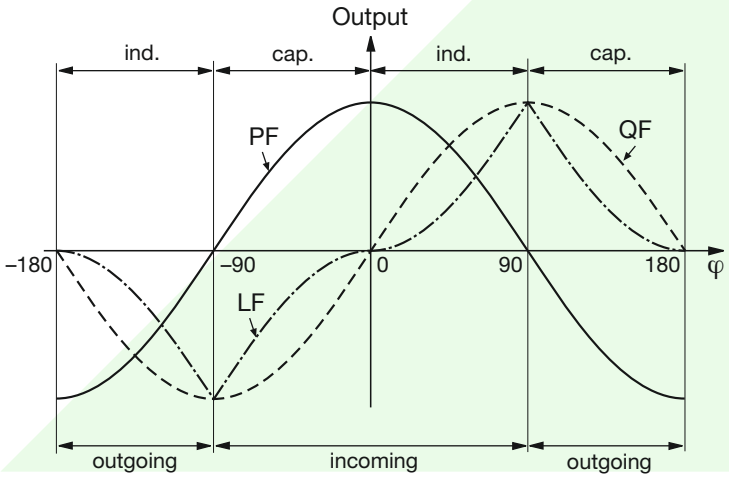



*Fig. 5. Active power PF ——, reactive power QF ------, power factor LF – – – – –.*

## Dimensional drawings

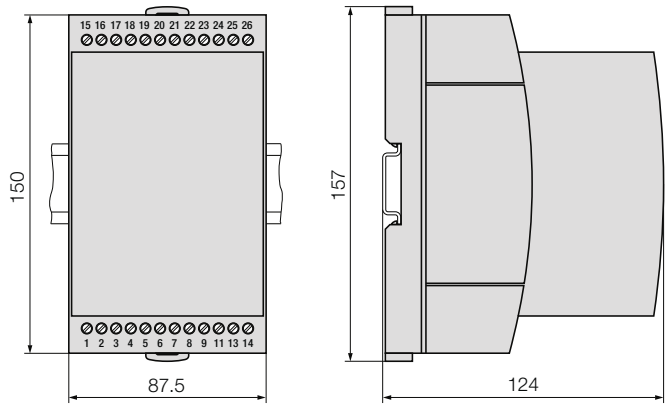



*Fig. 6. SINEAX DME 424/442 in housing **T24** clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).*

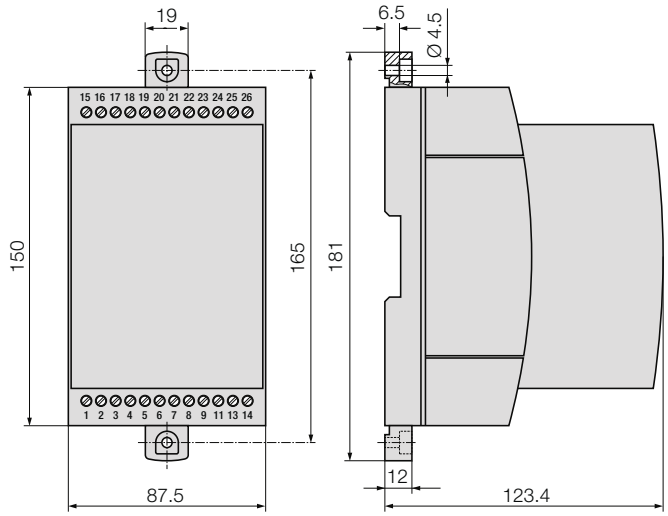



*Fig. 6. SINEAX DME 424/442 in housing **T24,** screw hole mounting brackets pulled out.*

## Table 5: Accessories

| Description | Order No. |
|---|---|
| **Programming cable** | 980 179 |
| **Configuration software DME 4**<br>for SINEAX/EURAX DME 424, 440, 442, SINEAX DME 400, 401 and 406<br>Windows 3.1x, 95, 98, NT and 2000<br>on CD in German, English, Franch, Italian and Dutch<br>In addition, the CD contains all configuration programmes presently available for Camille Bauer products.<br>**Operating Instructions**<br>**DME 424/442-1** B d-f-e | 146 557 |
| | 122 250 |

| Description | Order No. |
|---|---|
| **SINEAX A 200** | 154 063 |
| **Interconnecting cable**<br>sub D 9 pol.<br>male/male 1.8 m | 154 071 |

## Standard accessories

1 Operating Instructions SINEAX DME 424/442 in three languages: German, French, English
1 blank type label for recording programmed settings

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# Appendix 1: PROGRAMMING FOR SINEAX TYPE DME 424

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**with 2 analog and 4 digital outputs**
**(see Data Sheet DME 424/442-1 Le, Table 4: "Programming for types DME 424 and 442")**

Customer / Agent: _____ Date: _____

Order No. / Item: _____ Delivery date: _____

No. of instruments: _____

Type of instrument (marking): _____

_____

| | | |
|---|---|---|
| | **1. Application** | |
| A | System _____ | |
| | **2. Input voltage, rated value** | |
| U | Ur = _____ | |
| | **3. Input current, rated value** | |
| V | Ir = _____ | |
| | **4. Primary transformer** | |
| W | CT = _____ A / _____ A | VT = _____ kV / _____ V |
| | **Output A** | |
| A A | 5. Measured variable Type: _____ | X0 = _____ X2 = _____ |
| A B | 6. Output signal | Y0 = _____ Y2 = _____ |
| A C | 7. Characteristic linear/bent | X1 = _____ Y1 = _____ |
| A D | 8. Limits | Standard / Ymin = _____ Ymax = _____ |
| | **Output B** | |
| B A | 9. Measured variable Type: _____ | X0 = _____ X2 = _____ |
| B B | 10. Output signal | Y0 = _____ Y2 = _____ |
| B C | 11. Characteristic linear/bent | X1 = _____ Y1 = _____ |
| B D | 12. Limits | Standard / Ymin = _____ Ymax = _____ |
| | **Output E** | |
| E A | 21. Measured variable Type: _____ | Additional information: _____ |
| E B | 22. Output signal (limit contact only) | ON / OFF |
| E C | 23. Pick-up delay | YDel = _____ s |

| | | |
|---|---|---|
| | **Output F** | |
| F A | 24. Measured variable Type: _____ | Additional information: _____ |
| F B | 25. Output signal (limit contact only) | ON / OFF |
| F C | 26. Pick-up delay | YDel = _____ s |
| | **Output G** | |
| G A | 27. Measured variable Type: _____ | Additional information: _____ |
| G B | 28. Output signal (limit contact only) | ON / OFF |
| G C | 29. Pick-up delay | YDel = _____ s |
| | **Output H** | |
| H A | 30. Measured variable Type: _____ | Additional information: _____ |
| H B | 31. Output signal (limit contact only) | ON / OFF |
| H C | 32. Pick-up delay | YDel = _____ s |

# Appendix 2: PROGRAMMIING FOR SINEAX TYPE DME 442

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**with 4 analog and 2 digital outputs**
**(see Date Sheet DME 424/442-1 Le, Table 4: "Programming for types DME 424 and 442")**

Customer / Agent: _____ Date: _____

Order No. / Item: _____ Delivery date: _____

No of instruments: _____

Type of instrument (marking): _____

_____

| | | |
|---|---|---|
| | **1. Application** | |
| A | System | _____ |
| | **2. Input voltage, rated value** | |
| U | Ur = | _____ |
| | **3. Input current, rated value** | |
| V | Ir = | _____ |
| | **4. Primary transformer** | |
| W | CT = _____ A / _____ A | VT = _____ kV / _____ V |
| | **Output A** | |
| A A | 5. Measured variable Type: _____ | X0 = _____ X2 = _____ |
| A B | 6. Output signal | Y0 = _____ Y2 = _____ |
| A C | 7. Characteristic linear / bent | X1 = _____ Y1 = _____ |
| A D | 8. Limits | Standard / Ymin = _____ Ymax = _____ |
| | **Output B** | |
| B A | 9. Measured variable Type: _____ | X0 = _____ X2 = _____ |
| B B | 10. Output signal | Y0 = _____ Y2 = _____ |
| B C | 11. Characteristic linear / bent | X1 = _____ Y1 = _____ |
| B D | 12. Limits | Standard / Ymin = _____ Ymax = _____ |
| | **Output C** | |
| C A | 13. Measured variable Type: _____ | X0 = _____ X2 = _____ |
| C B | 14. Output signal | Y0 = _____ Y2 = _____ |
| C C | 15. Characteristic linear / bent | X1 = _____ Y1 = _____ |
| C D | 16. Limits | Standard / Ymin = _____ Ymax = _____ |

| | | | |
|---|---|---|---|
| | **Output D** | | |
| D A | 17. Measured variable Type:_____ | X0 = _____ | X2 = _____ |
| D B | 18. Output signal | Y0 = _____ | Y2 = _____ |
| D C | 19. Characteristic linear / bent | X1 = _____ | Y1 = _____ |
| D D | 20. Limits | Standard / Ymin = _____ | Ymax = _____ |
| | **Output G** | | |
| G A | 21. Measured variable Type: _____ | Additional information: _____ | |
| G B | 22. Output signal (limit contact only) | ON / OFF | |
| G C | 23. Pick-up delay | YDel = _____ s | |
| | **Output H** | | |
| H A | 24. Measured variable Type: _____ | Additional information: _____ | |
| H B | 25. Output signal (limit contact only) | ON / OFF | |
| H C | 26. Pick-up delay | YDel = _____ s | |

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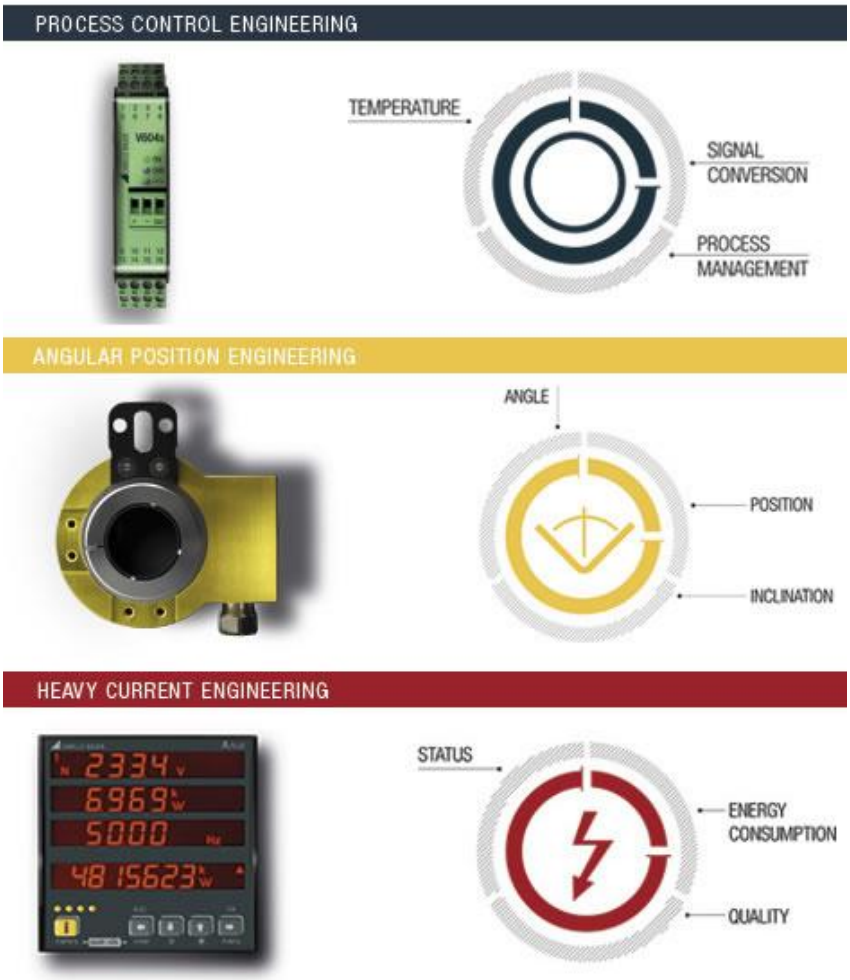


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