

SINEAX DME 400 with LONWORKS® Interface

Programmable Multi-Transducer

for the measurement of electrical variables in heavy-current power system

Application

SINEAX DME 400 (Fig. 1) is a programmable transducer with a LONWORKS® interface that simultaneously measures several variables of a heavy-current power system.

The device conforms to the LONMARK® interoperability guidelines, Version 3.0. The measured variables are transferred by means of standard network variable types (SNVT) and are available at the LON interface.

The device is programmed using the LONTALK® file transfer protocol.

The 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 methods of connection, the rated values of the input variables and the type of internal energy meter are the main parameters that can be programmed.

The ancillary functions include a power system check, a facility for printing rating labels and provision for reading and setting the energy meter.

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.

Features / Benefits

- Transfer of data via a LON interface with an FTT-10A transceiver and LONTALK® protocol
- 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 (phase-to-neutral) or 100 to 693 V (phase-to-phase)
- For all heavy-current power systems variables
- Input voltage up to 693 V (phase-to-phase)
- High accuracy: U/I/P 0.2% (under reference conditions)
- Up to 4 integrated energy meter, 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

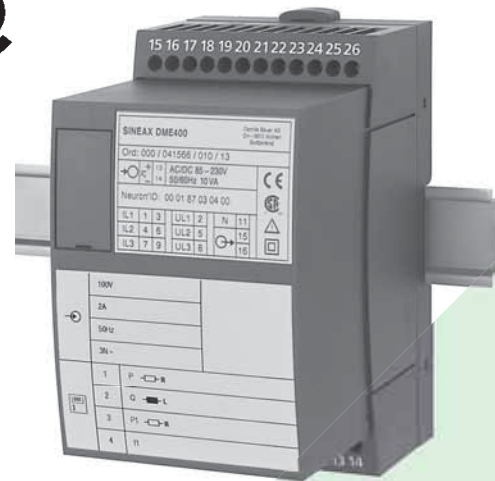


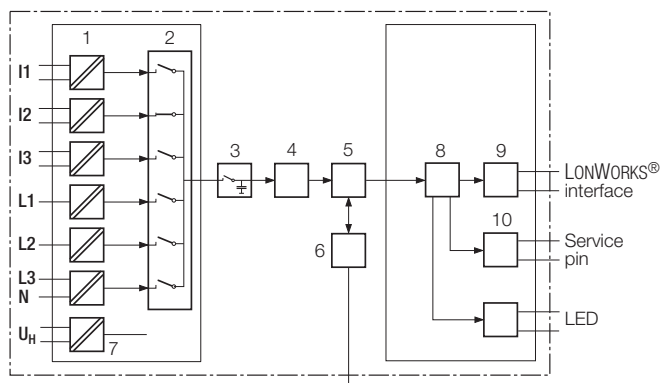
Fig. 1. SINEAX DME 400 in housing T24, clipped onto a top-hat rail.

- 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 RMS value of the current with wire setting range (bimetal measuring function) Slave pointer function for the measurement of the RMS value IB Frequency Average value of the currents with sign of the active power (power system only)	Data bus LON	DME 400
	2 analog outputs and 4 digital outputs	DME 424
	4 analog outputs and 2 digital outputs see datasheet DME 424/442-1 Le	DME 442
	4 analog outputs and bus interface RS 485 (MODBUS) see data sheet DME 440-1 Le	DME 440
	without analog outputs, with bus interface RS485 (MODBUS) see data sheet DME 401-1 Le	DME 401
	PROFIBUS DP see data sheet DME 406-1 Le	DME 406

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- 1 = Input transformer
- 2 = Multiplexer
- 3 = Latching stage
- 4 = A/D and D/A converter
- 5 = Microprocessor
- 6 = Programming interface RS-232 (electrically insulated)
- 7 = Power supply
- 8 = NEURON® Chip
- 9 = FTT-10
- 10 = Service pin

Fig. 2. Block diagram.

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
U	Input voltage
Ur	Rated value of the input voltage
U 12	Phase-to-phase voltage L1 and L2
U 23	Phase-to-phase voltage L2 and L3
U 31	Phase-to-phase voltage L3 and L1
U1N	Phase-to-neutral voltage L1 and N
U2N	Phase-to-neutral voltage L2 and N
U3N	Phase-to-neutral voltage L3 and N
UM	Average value of the voltages $(U1N + U2N + U3N) / 3$
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)

Symbols	Meaning
IB	RTMS value of the current with wire setting range (bimetal measuring function)
BS	Slave pointer function for the measurement of the RMS value IB
φ	Phase-shift between current and voltage
F	Frequency of the input variable
P	Active power of the system $P = P1 + P2 + P3$
P1	Active power phase 1 (phase-to-neutral L1 and N)
P2	Active power phase 2 (phase-to-neutral L2 and N)
P3	Active power phase 3 (phase-to-neutral L3 and N)
Q	Reactive power of the system $Q = Q1 + Q2 + Q3$
Q1	Reactive power phase 1 (phase-to-neutral L1 and N)
Q2	Reactive power phase 2 (phase-to-neutral L2 and N)
Q3	Reactive power phase 3 (phase-to-neutral L3 and 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 and N)
S2	Apparent power phase 2 (phase-to-neutral L2 and N)
S3	Apparent power phase 3 (phase-to-neutral L3 and 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 $Q2/S2$
QF3	Reactive power factor phase 3 $Q3/S3$
LF	Power factor of the system $LF = \text{sgn}Q \cdot (1 - PF)$
LF1	Power factor phase 1 $\text{sgn}Q1 \cdot (1 - PF1)$
LF2	Power factor phase 2 $\text{sgn}Q2 \cdot (1 - PF2)$
LF3	Power factor phase 3 $\text{sgn}Q3 \cdot (1 - PF3)$
H	Power supply
Hn	Rated value of the power supply

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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 industrial process 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 55 011	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 43 864	Current interface for the transmission of impulses between impulse encoder counter and tariff meter
UL 94	Tests for flammability of plastic materials for parts in devices and appliances
LONMARK®	Interoperability guidelines, Version 3.0

Technical data

Inputs

Input variable:	see Tables 3 and 4
Measuring ranges:	see Tables 3 and 4
Waveform:	Sinusoidal
Rated frequency:	50 ... 60; 16 2/3 Hz
Consumption:	Voltage circuit: $\leq U^2 / 400 \text{ k}\Omega$ Condition: external power supply Current circuit: $\leq 0.3 \text{ VA} \cdot I/5 \text{ A}$

Continuous thermal ratings of inputs

Current circuit	10 A	400 V single-phase AC system 693 V three-phase system
Voltage circuit	480 V 831 V	single-phase AC system 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 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 $H_{\text{intern}}: 1.5 U_r$	10	10 s	10 s
Three-phase system 1040 V $H_{\text{intern}}: 1.5 U_r$	10	10 s	10 s

LONWORKS® Interface

Standard programm ID: 80 00 36 15 03 04 04 01

Network protocol: LONTALK®

Transmission medium: Echelon FTT-10A transceiver, transformer coupled, reverse polarity protected, twisted 2-wire cable

Transmission speed: 78 kBit/s

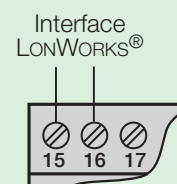
Node within a subnet: 127

Subnet: 255

Number of nodes per network: Max. 32'385 (127 x 255)

Bus termination: External

Terminals: Screw terminals, terminals 15 and 16



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SINEAX DME 400 with LONWORKS® Interface

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Table 1: Standard network variable types (according to application)

Symbols	Meaning	Application (see Table 4)		
		A11... A16	A34	A24/A44
U	Input voltage	•	—	—
U12	Phase-to-phase voltage L1 and L2	—	•	•
U23	Phase-to-phase voltage L2 and L3	—	•	•
U31	Phase-to-phase voltage L3 and L1	—	•	•
U1N	Phase-to-neutral voltage L1 and N	—	—	•
U2N	Phase-to-neutral voltage L2 and N	—	—	•
U3N	Phase-to-neutral voltage L3 and N	—	—	•
UM	Average value of the voltages	—	—	•
I	Input current	•	—	—
I1	AC current L1	—	•	•
I2	AC current L2	—	•	•
I3	AC current L3	—	•	•
IM	Average value of the currents	—	•	•
IMS	Average value of the currents and sign of the active power	—	•	•
IB	RMS value of the current with wire setting range (bimetal measuring function)	•	—	—
IB1	RMS value of the current with wire setting range (bimetal measuring function), phase 1	—	•	•
IB2	RMS value of the current with wire setting range (bimetal measuring function), phase 2	—	•	•
IB3	RMS value of the current with wire setting range (bimetal measuring function), phase 3	—	•	•
BS	Slave pointer function for the measurement of the RMS value IB	•	—	—
BS1	Slave pointer function for the measurement of the RMS value IB, phase 1	—	•	•
BS2	Slave pointer function for the measurement of the RMS value IB, phase 2	—	•	•
BS3	Slave pointer function for the measurement of the RMS value IB, phase 3	—	•	•
F	Frequency of the input variable	•	•	•
P	Active power of the system	•	•	•
P1	Active power phase 1 (phase-to-neutral L1 and N)	—	—	•
P2	Active power phase 2 (phase-to-neutral L2 and N)	—	—	•
P3	Active power phase 3 (phase-to-neutral L3 and N)	—	—	•
PF	Active power factor $\cos\varphi = P/S$	•	•	•
PF1	Active power factor phase 1, P1/S2	—	—	•
PF2	Active power factor phase 2, P2/S2	—	—	•
PF3	Active power factor phase 3, P3/S3	—	—	•
Q	Reactive power of the system	•	•	•
Q1	Reactive power phase 1 (phase-to-neutral L1 and N)	—	—	•
Q2	Reactive power phase 2 (phase-to-neutral L2 and N)	—	—	•
Q3	Reactive power phase 3 (phase-to-neutral L3 and N)	—	—	•
S	Apparent power of the system	•	•	•
S1	Apparent power phase 1 (phase-to-neutral L1 and N)	—	—	•
S2	Apparent power phase 2 (phase-to-neutral L2 and N)	—	—	•
S3	Apparent power phase 3 (phase-to-neutral L3 and N)	—	—	•

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Symbols	Meaning	Application (see Table 4)		
		A11... A16	A34	A24/A44
LF	Power factor of the system	•	•	•
LF1	Power factor phase 1	—	—	•
LF2	Power factor phase 2	—	—	•
LF3	Power factor phase 3	—	—	•
QF	Reactive power factor $\sin\varphi = Q/S$	•	•	•
QF1	Reactive power factor phase 1, Q1/S1	—	—	•
QF2	Reactive power factor phase 2, Q2/S2	—	—	•
QF3	Reactive power factor phase 3, Q3/S3	—	—	•
EA	Energy meter 1	•	•	•
EB	Energy meter 2	•	•	•
EC	Energy meter 3	•	•	•
ED	Energy meter 4	•	•	•

Where c.t.'s and/or v.t.'s are used for measurement, the values are referred to the primaries of the transformers.

Variables

- Energy meter reset
- Maximum value pointer reset

Reference conditions

Ambient temperature:	15 ... 30 °C
Input variable:	Rated useful range
Power supply:	$H = H_n \pm 1\%$
Active/reactive factor:	$\cos\varphi = 1$ resp. $\sin\varphi = 1$
Frequency:	50 ... 60 Hz, 16 2/3 Hz
Waveform:	Sinusoidal, form factor 1.1107
Miscellaneous:	EN 60 688

Insulation test:

Input voltage:	AC 400 V
Input current:	AC 400 V
Output:	DC 40 V
Power supply:	AC 400 V DC 230 V

Surge test:

5 kV; 1.2/50 μ s; 0.5 Ws

Test voltages:

50 Hz, 1 min. according 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

System response

Accuracy class:	0.2 resp. 0.4 at applications with phase-shift
Energy meter:	1.0 acc. to IEC 1036 ($0.1 I_r \leq I \leq 1.5 I_r$)
Duration of the measurement cycle:	Depending on measured variable and programming
Response time:	1...2 times the measurement cycle

Power supply →

AC voltage:	100, 110, 230, 400, 500 or 693 V, $\pm 10\%$, 45 to 65 Hz Power consumption approx. 10 VA
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Influencing quantities and permissible variations

Acc. to EN 60 688

AC/DC power pack (DC and 50 ... 60 Hz)

Table 2: Rated voltages and tolerances

Rated voltage U_N	Tolerance
24 ... 60 V DC / AC	DC – 15 ... + 33%
85 ... 230 V DC / AC	AC $\pm 10\%$

Safety

Protection class:	II
Enclosure protection:	IP 40, housing IP 20, terminals
Installation category:	III

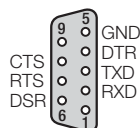
Consumption: ≤ 9 W resp. ≤ 10 VA

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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

Basic programming

A version of the SINEAX DME 400 transducer with a **basic** program is also available which is recommended if the programming data are unknown at the time of ordering (see "Table 3: Ordering information", Feature 6).

Basic programming		Marking
Application:	4-wire, 3-phase system, asymmetric load (NPS)	A 44
Input voltage:	Design value $U_r = 100 \text{ V}$	U 21
Input current:	Design value $I_r = 2 \text{ A}$ without specification of primary rating	V 2 W 0
Energy meter 1:	P System (incoming)	EA 58
Energy meter 2:	Q System (ind.)	FA 62
Energy meter 3:	P1 L1 (incoming)	GA 59
Energy meter 4:	I1 L1	HA 51

Table 3: Ordering information

DESCRIPTION	MARKING
1. Mechanical design	
Housing T24 for rail and wall mounting	400 - 1

Max. wire gauge: $\leq 4.0 \text{ mm}^2$ single wire or $2 \times 2.5 \text{ mm}^2$ fine wire

Vibration withstand

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

Acceleration: $\pm 2 \text{ g}$

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: $\pm 0.2\% / 10 \text{ K}$

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: $\leq 75\%$

Altitude: 2000 m max.

Indoor use statement!

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DESCRIPTION	MARKING
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-programmed by user, 50/60 Hz possible, but with additional error 1.25 · c)	3
3. Power supply	
Nominal range	
AC 90 ... 110 V $H_n = 100$ V	1
AC 99 ... 121 V $H_n = 110$ V	2
AC 207 ... 253 V $H_n = 230$ V	3
AC 360 ... 440 V $H_n = 400$ V	4
AC 450 ... 550 V $H_n = 500$ V	5
AC 623 ... 762 V $H_n = 693$	6
DC/AC 24 ... 60 V CSA approved	7
DC/AC 85 ... 230 V CSA approved	8
4. Power supply connection	
External (standard)	1
Internal from voltage input (not allowed for CSA) Not available for rated frequency 16 2/3 Hz and applications A15 / A16 / A24. Caution: The power supply voltage must agree with the input voltage (Table 4)!	2
5. Test certificate	
None supplied	0
Supplied	1
6. Programming	
Basic (not available if the power supply is taken from the voltage input)	0
According to specification All the programming data must be entered on Form W 2388e (see appendix) and the form must be included with the order, if the primary values of the measured variables or meter readings have to be transferred!	9

Table 4: Programming

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

* Accuracy class 0.4

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DESCRIPTION	Application		
	A11... A16	A34	A24/A44
2. Input voltage			
Rated value $U_r = 57.7$ V	U01	—	—
Rated value $U_r = 63.5$ V	U02	—	—
Rated value $U_r = 100$ V	U03	—	—
Rated value $U_r = 110$ V	U04	—	—
Rated value $U_r = 120$ V	U05	—	—
Rated value $U_r = 230$ V	U06	—	—
Rated value U_r (U_r [V] 57 to 400) [M]	U91	—	—
Rated value $U_r = 100$ V	U21	U21	U21
Rated value $U_r = 110$ V	U22	U22	U22
Rated value $U_r = 115$ V	U23	U23	U23
Rated value $U_r = 120$ V	U24	U24	U24
Rated value $U_r = 400$ V	U25	U25	U25
Rated value $U_r = 500$ V	U26	U26	U26
Rated value U_r (U_r [V] > 100 to 693) [M]	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 $I_r = 1$ A	V1	V1	V1
Rated value $I_r = 2$ A	V2	V2	V2
Rated value $I_r = 5$ A	V3	V3	V3
Rated value I_r (I_r [A] > 1 to 6) [A]	V9	V9	V9
4. Primary rating (primary transformer)			
Without specification of primary rating	W0	W0	W0
CT = _____ A VT = _____ kV Specify transformer ratio prim. 33 kV/1000 A The secondary ratings must correspond to the rated input voltage and current specified for feature 2, respectively 3.	W9	W9	W9
5. Energy meter 1			
Not used	EA00	EA00	EA00
I System [Wh]	EA50	—	—
I1 L1 [Wh]	—	EA51	EA51
I2 L2 [Wh]	—	EA52	EA52
I3 L3 [Wh]	—	EA53	EA53
S System [Wh]	EA54	EA54	EA54
S1 L1 [Wh]	—	—	EA55
S2 L2 [Wh]	—	—	EA56
S3 L3 [Wh]	—	—	EA57
P System (incoming) [Wh]	EA58	EA58	EA58
P1 L1 (incoming) [Wh]	—	—	EA59
P2 L2 (incoming) [Wh]	—	—	EA61
P3 L3 (incoming) [Wh]	—	—	EA61

Continuation of Table 4 see on next page!

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DESCRIPTION	Application					
	A11... A16	A34	A24/A44			
5. Energy meter 1 (continuation)						
Q	System	(inductive)	[Wh]	EA62	EA62	EA62
Q1	L1	(inductive)	[Wh]	—	—	EA63
Q2	L2	(inductive)	[Wh]	—	—	EA64
Q3	L3	(inductive)	[Wh]	—	—	EA65
P	System	(outgoing)	[Wh]	EA66	EA66	EA66
P1	L1	(outgoing)	[Wh]	—	—	EA67
P2	L2	(outgoing)	[Wh]	—	—	EA68
P3	L3	(outgoing)	[Wh]	—	—	EA69
Q	System	(capacitive)	[Wh]	EA70	EA70	EA70
Q1	L1	(capacitive)	[Wh]	—	—	EA71
Q2	L2	(capacitive)	[Wh]	—	—	EA72
Q3	L3	(capacitive)	[Wh]	—	—	EA73
6. Energy meter 2						
Same as energy meter 1, but markings start with a capital F				FA ..	FA ..	FA ..
7. Energy meter 3						
Same as energy meter 1, but markings start with a capital G				GA ..	GA ..	GA ..
8. Energy meter 4						
Same as energy meter 1, but markings start with a capital H				HA ..	HA ..	HA ..

Note: The energy reading is referred to the power $P = I \cdot U_p$ for I, respectively $I1 \cdot U_p$ for I1, $I2 \cdot U_p$ for I2 and $I3 \cdot U_p$ for I3 where U_p = the primary rated voltage or the secondary rated voltage if there is no v.t..

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Electrical connections

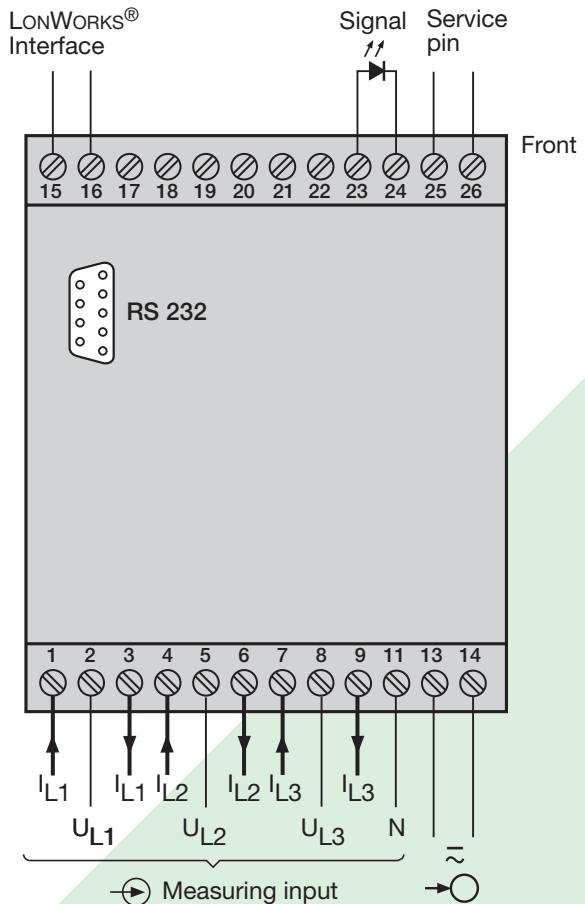
Function			Connection
Measuring input 	AC current	IL1	1 / 3
		IL2	4 / 6
		IL3	7 / 9
	AC voltage	UL1	2
UL2		5	
UL3		8	
N		11	
LONWORKS® Interface			15 16
Signal			23 24
Service pin			25 26
Power supply 	AC	~	13 14
		~	13 14
	DC	+	13
		-	14

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)

Find and Signal (terminals 23 and 24)

By polling the LONWORKS® network, it is possible to determine the neuron ID's of the various devices connected. A signal prompts the particular device to identify itself. A LED (e.g. HLMP, Order No. 970 881) connected to terminals 23 and 24 flashes briefly.



Service pin (terminals 25 and 26)

A device is made to send its Neuron-ID by short-circuiting terminals 25 and 26.

Measuring inputs

System / application	Terminals
Single-phase AC system	<p>The diagram shows three circuit diagrams for a single-phase AC system. Each diagram has four terminals labeled 2, 11, 1, and 3. The first diagram shows a simple connection where terminal 2 is connected to L1, terminal 11 to N, terminal 1 to L1, and terminal 3 to N. The second diagram shows a connection with a current transformer (K) and a load (L). Terminal 2 is connected to L1, terminal 11 to N, terminal 1 to the primary of K, and terminal 3 to the secondary of K. The third diagram shows a connection with a voltage transformer (U) and a load (L). Terminal 2 is connected to L1, terminal 11 to N, terminal 1 to the primary of U, and terminal 3 to the secondary of U. The secondary of U is connected to a load (L) and N.</p>

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Measuring inputs																		
System / application	Terminals																	
3-wire 3-phase symmetric load I: L1	<p>Connect the voltage according to the following table for current measurement in L2 or L3:</p> <table border="1"> <thead> <tr> <th>Current transf.</th> <th>Terminals</th> <th>2</th> <th>5</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>L2</td> <td>1</td> <td>3</td> <td>L2</td> <td>L3</td> <td>L1</td> </tr> <tr> <td>L3</td> <td>1</td> <td>3</td> <td>L3</td> <td>L1</td> <td>L2</td> </tr> </tbody> </table>	Current transf.	Terminals	2	5	8	L2	1	3	L2	L3	L1	L3	1	3	L3	L1	L2
Current transf.	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	<p>Connect the voltage according to the following table for current measurement in L2 or L3:</p> <table border="1"> <thead> <tr> <th>Current transf.</th> <th>Terminals</th> <th>2</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>L2</td> <td>1</td> <td>3</td> <td>L2</td> <td>L3</td> </tr> <tr> <td>L3</td> <td>1</td> <td>3</td> <td>L3</td> <td>L1</td> </tr> </tbody> </table>	Current transf.	Terminals	2	5	L2	1	3	L2	L3	L3	1	3	L3	L1			
Current transf.	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	<p>Connect the voltage according to the following table for current measurement in L2 or L3:</p> <table border="1"> <thead> <tr> <th>Current transf.</th> <th>Terminals</th> <th>8</th> <th>2</th> </tr> </thead> <tbody> <tr> <td>L2</td> <td>1</td> <td>3</td> <td>L1</td> <td>L2</td> </tr> <tr> <td>L3</td> <td>1</td> <td>3</td> <td>L2</td> <td>L3</td> </tr> </tbody> </table>	Current transf.	Terminals	8	2	L2	1	3	L1	L2	L3	1	3	L2	L3			
Current transf.	Terminals	8	2															
L2	1	3	L1	L2														
L3	1	3	L2	L3														

SINEAX DME 400 with LONWORKS® Interface

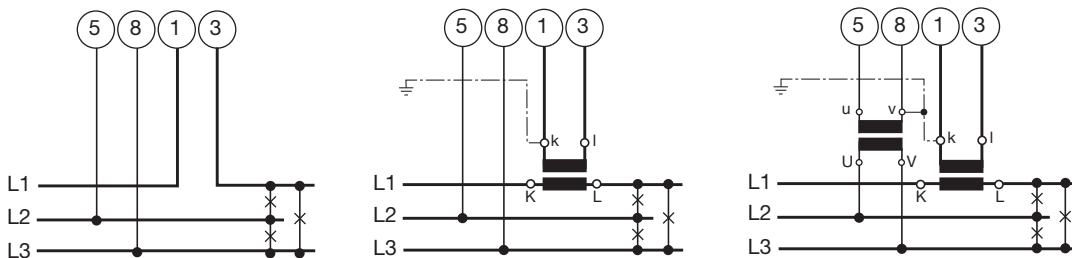
Programmable Multi-Transducer

Measuring inputs

System / application

Terminals

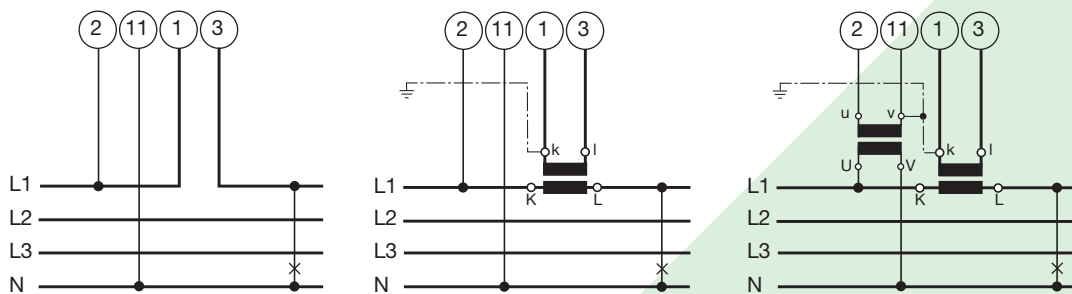
3-wire
3-phase
symmetric
load
phase-shift
U: L2 – L3
I: L1



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

Current transf.	Terminals		5	8
	L2	1	3	L3
L3	1	3	L1	L2

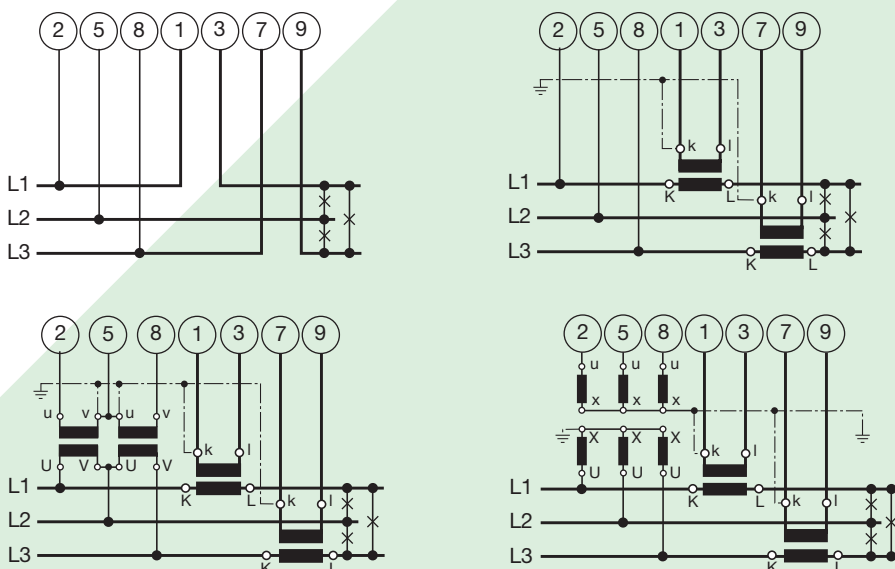
4-wire
3-phase
symmetric
load
I: L1



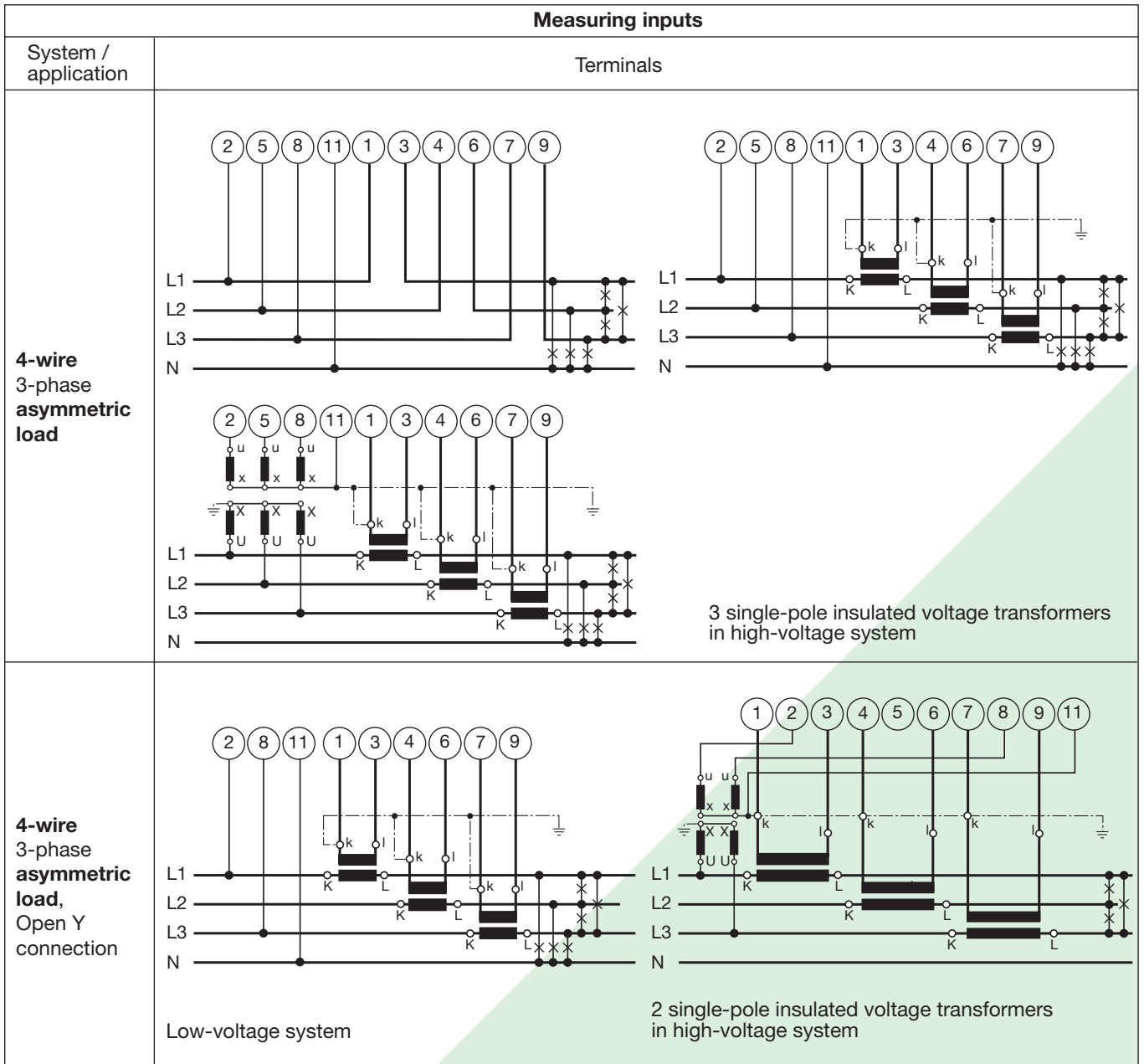
Connect the voltage according to the following table for current measurement in L2 or L3:

Current transf.	Terminals		2	11
	L2	1	3	L2
L3	1	3	L3	N

3-wire
3-phase
asymmetric
load



SINEAX DME 400 with LONWORKS® Interface Programmable Multi-Transducer



Relationship between PF, QF and LF

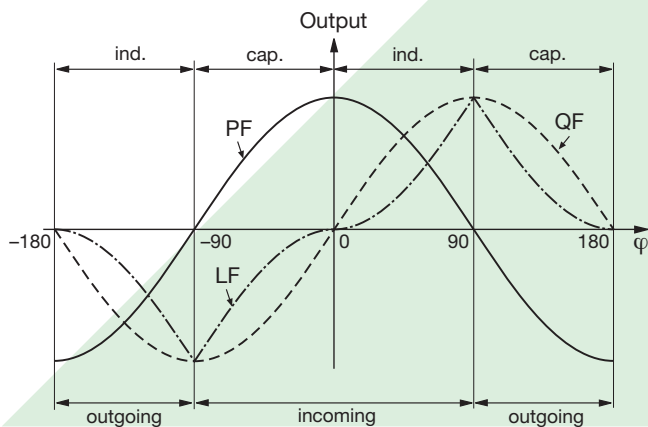


Fig. 3. Active power PF —, reactive power QF -----, power factor LF - - - - -.

SINEAX DME 400 with LONWORKS® Interface

Programmable Multi-Transducer

Dimensioned drawings

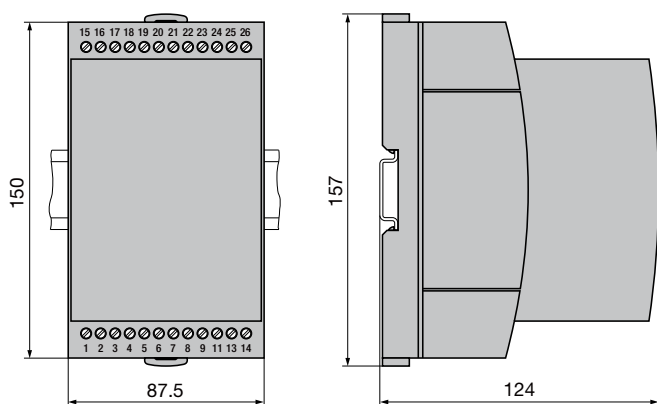


Fig. 4. SINEAX DME 400 in housing T24 clipped onto a top-hat rail (35 x 15 mm ou 35 x 7.5 mm, acc. to EN 50 022).

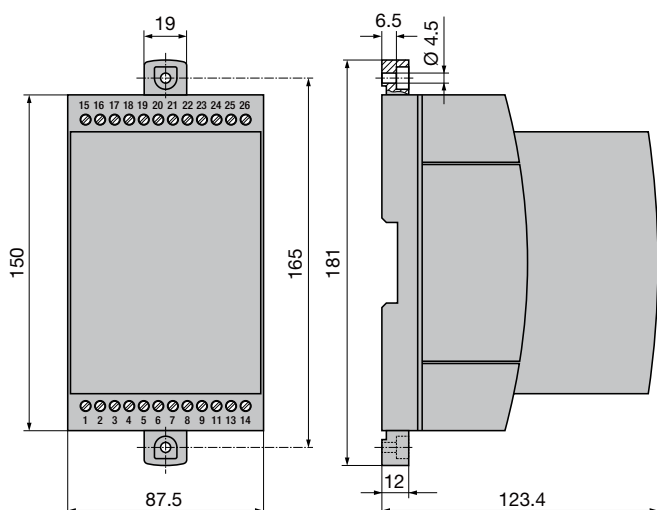


Fig. 5. SINEAX DME 400 in housing T24, screw hole mounting brackets pulled out.

Table 5: Accessories

Description	Order No.
Programming cable	980 179
Configuration software DME 4 for SINEAX/EURAX DME 424, 440, 442, SINEAX DME 400, 401 and 406 Windows 3.1x, 95, 98, NT and 2000 on CD in German, English, French, Italian and Dutch (Download free of charge under http://www.camillebauer.com) In addition, the CD contains all configuration programmes presently available for Camille Bauer products.	146 557
Operating Instructions DME 400-1 B d-f-e, in three languages: German, English, French	127 119



Description	Order No.
SINEAX A 200	154 063
Interconnecting cable sub D 9 pol. mal/male 1.8 m	154 071

 **CAMILLE BAUER**

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

Appendix: PROGRAMMING FOR SINEAX TYPE DME 400



(see Data Sheet DME 400-1 Le, Table 4: "Programming")

Customer / Agent: _____	Date: _____
Order No. / Item: _____	Delivery date: _____
No of instruments: _____	
Type of instrument (marking): _____	

Codes for features 1 to 8:

Features 1 to 8 concern data for configuring the software.

A				1. Application	
				System _____	
U				2. Input voltage, rated value	
				Ur = _____ V	
V				3. Input current, rated value	
				Ir = _____ A	
W				4. Primary transformer	
				VT = _____ kV	CT = _____ A
				Specify transformer ratio prim. 33 kV/1000 A	
				The secondary ratings must correspond to the rated input voltage and current specified for feature 2, respectively 3.	
E	A			5. Energy counter 1	
F	A			6. Energy counter 2	
G	A			7. Energy counter 3	
H	A			8. Energy counter 4	