SINEAX DME 424/442
Programmable multi-transducers

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

CE

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 analogue output signals.

2 or 4 digital outputs are available for signalling limits or power 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 nameplates.

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.

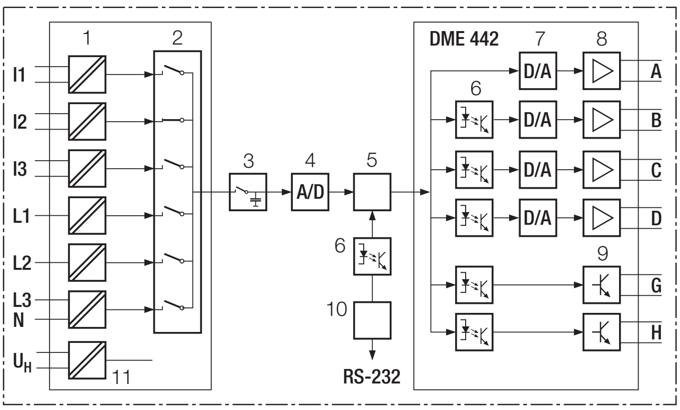
*Fig. 1. The **universal** basic version*
*SINEAX DME 442 in housing **T24,** clipped onto a top-hat rail.*

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)**

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)	**2 analogue outputs and 4 digital outputs or**	**DME 424**
	4 analogue outputs and 2 digital outputs	**DME 442**
	4 analogue outputs and bus RS 485 (MODBUS) see Data Sheet DME 440-1 Le	DME 440
	Data bus (LON) see Data Sheet DME 400-1 Le	DME 400

- **For all heavy-current power system variables**
- **Up to 6 outputs (2A + 4D or 4A + 2D)**
- **Input voltage up to 693 V (phase-to-phase)**
- **Universal analogue outputs (programmable)**
- **High accuracy: U/I 0.2% and P 0.25% (under reference conditions)**
- **Universal digital outputs (meter transmitter, limits)**
- **Up to 2 or 4 integrated power 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**



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

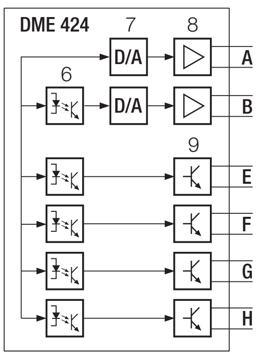


Fig. 2. Block diagram.
A, B, C, D = analogue outputs; E, F, G, H = digital outputs.

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Programmable multi-transducers

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
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)

Symbols	Meaning
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 cosφ = 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 φ = 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 $LF = sgnQ \cdot (1 - \|PF\|)$
LF1	Power factor phase 1 $sgnQ1 \cdot (1 - \|PF1\|)$
LF2	Power factor phase 2 $sgnQ2 \cdot (1 - \|PF2\|)$
LF3	Power factor phase 3 $sgnQ3 \cdot (1 - \|PF3\|)$
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

DIN EN 60 688	Electrical measuring transducers for converting AC electrical variables into analogue 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 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 3, 5 and 6
Measuring ranges:	see Table 3, 5 and 6
Waveform:	Sinusoidal
Rated frequency:	50…60 Hz; 16 2/3 Hz
Consumption:	Voltage circuit: ≤ U^2 / 400 kΩ Condition: external power supply Current circuit: 0.3 VA · I/5 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_{intern}: 1.5 Ur	10	10 s	10 s
Three-phase system 1040 V H_{intern}: 1.5 Ur	10	10 s	10 s

Analogue 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		$0 \leq \frac{7.5\ V}{Y2} \leq \frac{15\ V}{Y2}$	$\frac{Y2}{2\ mA} \leq \frac{Y2}{1\ mA} \leq \infty$
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).

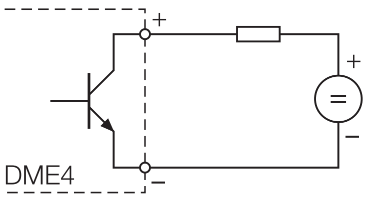
All the full-scale output values can be reduced subsequently using the programming software, but a supplementary error results.

The hardware full-scale settings for the analogue 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 varying 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 pulses:	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:	+ 23 °C ± 1 K
Pre-conditioning:	30 min. acc. to DIN 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: $R_n = \frac{7.5\text{ V}}{Y2} \pm 1\%$ DC voltage output: $R_n = \frac{Y2}{1\text{ mA}} \pm 1\%$
Miscellaneous:	DIN 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 0.3 ≤ X2/Sr < 0.5	0.25 c 0.5 c
Phase: Active, reactive and apparent power	0.167 ≤ X2/Sr ≤ 0.5 0.1 ≤ X2/Sr < 0.167	0.25 c 0.5 c
Power factor, active power and reactive power	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 < 0.5Sr, 1 ≤ (X2 - X0) < 2	1.0 c
	0.1Sr ≤ S < 0.5Sr, 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) 0.15 + 0.1 c (f_N = 16 2/3 Hz)
Pulse	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:

$$c = \frac{1 - \frac{Y0}{Y2}}{1 - \frac{X0}{X2}} \text{ or } c = 1$$

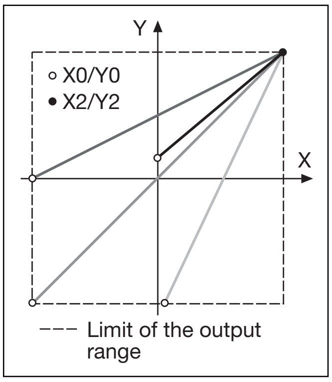
Bent characteristic:

X0 ≤ X ≤ X1

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

X1 < X ≤ X2

$$c = \frac{1 - \frac{Y1}{Y2}}{1 - \frac{X1}{X2}} \text{ or } c = 1$$



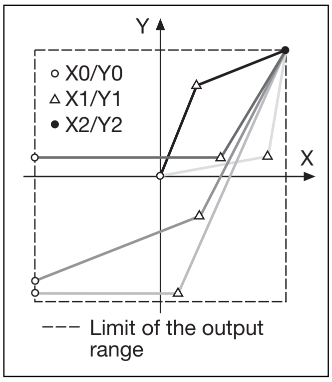


Fig. 3. Examples of settings with linear characteristic.

Fig. 4. Examples of settings with bent characteristic.

Influencing quantities and permissible variations

Acc. to DIN IEC 688

Safety

Protection class:	II	
Enclosure protection:	IP 40, housing IP 20, terminals	
Overvoltage category:	III	
Insulation test (versus earth):	Input voltage: Input current:	AC 400 V AC 400 V
	Output:	DC 40 V
	Power supply:	AC 400 V DC 230 V
Surge test:	5 kV; 1.2/50 µs; 0.5 Ws	
Test voltages:	50 Hz, 1 Min. according to DIN 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 voltage: 100, 110, 230, 400, 500 or 693 V, ± 10%, 45 to 65 Hz
Power consumption approx. 10 VA

AC/DC power pack (DC and 50 … 60 Hz)

Table 1: Rated voltages and tolerances

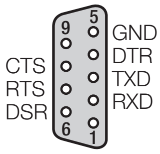
Rated voltage U_N	Tolerance
24 … 60 V DC/AC	DC – 15 … + 33% AC ± 10%
85 … 230 V DC/AC	

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 × 15 mm or 35 × 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 mm^2 single wire or 2 × 2.5 mm^2 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

Climatic rating: Climate class 3 acc. to VDI/VDE 3540

Variations due to ambient temperature: ± 0.1% / 10 K

Nominal range of use for temperature: 0…<u>15…30</u>…45 °C (usage group II)

Storage temperature: – 40 to + 85 °C

Annual mean relative humidity: ≤ 75%

SINEAX DME 424/442
Programmable multi-transducers

Table 2: SINEAX DME 424, standard version (2 analogue and 4 digital outputs)

The two versions of the transducer below with the **basic** programming are available ex stock. It is only necessary to quote the **Order No.:**

Description / Basic programming		Marking	Order No.
Mechanical design:	Housing T24 for rail and wall mounting	424 - 1	
Rated frequency:	50 Hz (60 Hz admissible without additional error, re-programming by user for 16 2/3 Hz possible, but with additional error 1,25 · c)	1	
Power supply:	**230 V AC** **85…230 V DC/AC**	**3** **8**	**129 181** **129 199**
Power supply:	External connection (standard)	1	
Full-scale output signal, output A:	Y2 = 20 mA	1	
Full-scale output signal, output B:	Y2 = 20 mA	1	
Test certificate:	None supplied	0	
Programming:	Basic	0	
See Table 3: "Ordering information for SINEAX DME 424 with 2 analogue and 4 digital outputs"			
Basic programming			
Application:	4-wire, 3-phase system, asymmetric load (NPS)	A 44	
Input voltage:	Design value Ur = 100 V	U 21	
Input current:	Design value Ir = 2 A without specification of primary rating	V 2 W0	
Measured variable, output A:	P1; X0 = 115.47 W; X2 = 115.47 W	AA 913	
Output signal, output A:	**DC current Y0 = – 20 mA; Y2 = 20 mA** Linear characteristic Standard limits	AB 91 AC 01 AD 01	
Measured variable, output B:	P2; X0 = – 115.47; X2 = 115.47 W	BA 914	
Output signal, output B:	**DC current Y0 = – 20 mA; Y2 = 20 mA** Linear characteristic Standard limits	BB 91 BC 01 BD 01	
Measured variable, output E:	Limit P; XI = 311.77 W Output ON if X > XI Min. pick-up delay	EA 912 EB 01 EC 01	
Measured variable, output F:	Limit Q; XI = 34.64 var Output ON if X > XI Min. pick-up delay	FA 916 FB 01 FC 01	
Measured variable, output G:	Limit P1; XI = 115.47 W Output ON if X > XI Min. pick-up delay	GA 913 GB 01 GC 01	
Measured variable, output H:	Limit I1; XI = 2 A Output ON if X > X1 Min. pick-up delay	HA 909 HB 01 HC 01	

The complete Order Code 424-1... .... according to "Table 3: Ordering information for SINEAX DME 424" should be stated for other versions.

Table 3: Ordering information for SINEAX DME 424 with 2 analogue and 4 digital outputs
(see also Table 2: Standard versions)

DESCRIPTION	MARKING
1. Mechanical design	
Housing T24 for rail and wall mounting	424 - 1
2. Rated frequency	
1) 50 Hz (60 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 · c)	1
2) 60 Hz (50 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 · c)	2
3) 16 2/3 Hz (not re-programming by user, 50/60 Hz possible, but with additional error 1.25 · c)	3
3. Power supply	
Nominal range	
1) AC 90 … 110 V H_n = 100 V	1
2) AC 99 … 121 V H_n = 110 V	2
3) AC 207 … 253 V H_n = 230 V	3
4) AC 360 … 440 V H_n = 400 V	4
5) AC 450 … 550 V H_n = 500 V	5
6) AC 623 … 762 V H_n = 693 V	6
7) DC/AC 24 … 60 V	7
8) DC/AC 85 … 230 V	8
4. Power supply connection	
1) External (standard)	1
2) External or internal from voltage input	2
Line 2: Not available for rated frequency 16 2/3 Hz and applications A15 / A16 / A24 (see Table 6) Caution: The power supply voltage must agree with the input voltage (Table 6)	
5. Full-scale output signal, output A	
1) Output A, Y2 = 20 mA (standard)	1
9) Output A, Y2 [mA]	9
Z) Output A, Y2 [V]	Z
Line 9: Full-scale current Y2 [mA] 1 to 20 Line Z: Full-scale voltage Y2 [V] 1 to 10	
6. Full-scale output signal, output B	
1) Output B, Y2 = 20 mA (standard)	1
9) Output B, Y2 [mA]	9
Z) Output B, Y2 [V]	Z
7. Test certificate	
0) None supplied	0
1) Supplied	1
8. Programming	
0) Basic	0
9) According to specification	9
Line 0: Not available if the power supply is taken from the voltage input Line 9: **All the programming data must be entered on Form W 2386e and the form must be included with the order.**	

SINEAX DME 424/442
Programmable multi-transducers

Table 4: SINEAX DME 442, standard version (4 analogue and 2 digital outputs)

The two versions of the transducer below with the **basic** programming are available ex stock. It is only necessary to quote the **Order No.:**

Description / Basic programming		Marking	Order No.
Mechanical design:	Housing T24 for rail and wall mounting	442 - 1	
Rated frequency:	50 Hz (60 Hz admissible without additional error, re-programming by user for 16 2/3 Hz possible, but with additional error 1,25 · c)	1	
Power supply:	**230 V AC** **85…230 V DC/AC**	**3** **8**	**129 206** **129 214**
Power supply:	External connection (standard)	1	
Full-scale output signal, output A:	Y2 = 20 mA	1	
Full-scale output signal, output B:	Y2 = 20 mA	1	
Full-scale output signal, output C:	Y2 = 20 mA	1	
Full-scale output signal, output D:	Y2 = 20 mA	1	
Test certificate:	None supplied	0	
Programming:	Basic	0	
See Table 5: “Ordering information for SINEAX DME 442 with 4 analogue and 2 digital outputs”			
Basic programming			
Application:	4-wire, 3-phase system, asymmetric load (NPS)	A 44	
Input voltage:	Design value Ur = 100 V	U 21	
Input current:	Design value Ir = 2 A without specification of primary ratings	V 2 W0	
Measured variable, output A:	P1; X0 = 115.47 W; X2 = 115.47 W	AA 913	
Output signal, output A:	**DC current Y0 = – 20 mA; Y2 = 20 mA** Linear characteristic Standard limits	AB 91 AC 01 AD 01	
Measured variable, output B:	P2; X0 = – 115.47; X2 = 115.47 W	BA 914	
Output signal, output B:	**DC current Y0 = – 20 mA; Y2 = 20 mA** Linear characteristic Standard limits	BB 91 BC 01 BD 01	
Measured variable, output C:	P3; X0 = 115.47 W; X2 = 115.47 W	CA 915	
Output signal, output C:	**DC current Y0 = – 20 mA; Y2 = 20 mA** Linear characteristic Standard limits	CB 91 CC 01 CD 01	
Measured variable, output D:	P; X0 = – 346.41; X2 = 346.41 W	DA 912	
Output signal, output D:	**DC current Y0 = – 20 mA; Y2 = 20 mA** Linear characteristic Standard limits	DB 91 DC 01 DD 01	
Measured variable, output G:	Limit P1; XI = 115.47 W Output ON if X > XI Min. pick-up delay	GA 913 GB 01 GC 01	
Measured variable, output H:	Limit I1; XI = 2 A Output ON if X > X1 Min. pick-up delay	HA 909 HB 01 HC 01	

The complete Order Code 442-1... .... .. according to “Table 5: Ordering information for SINEAX DME 442” should be stated for other versions.

Table 5: Ordering information for SINEAX DME 442 with 4 analogue and 2 digital outputs
(see also Table 4: Standard version)

DESCRIPTION		MARKING
1. Mechanical design		
Housing T24 for rail and wall mounting		442 - 1
2. Rated frequency		
1) 50 Hz (60 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 · c)		1
2) 60 Hz (50 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 · c)		2
3) 16 2/3 Hz (not re-programming by user, 50/60 Hz possible, but with additional error 1.25 · c)		3
3. Power supply		
Nominal range		
1) AC 90 … 110 V H_n = 100 V		1
2) AC 99 … 121 V H_n = 110 V		2
3) AC 207 … 253 V H_n = 230 V		3
4) AC 360 … 440 V H_n = 400 V		4
5) AC 450 … 550 V H_n = 500 V		5
6) AC 623 … 762 V H_n = 693 V		6
7) DC/AC 24 … 60 V		7
8) DC/AC 85 … 230 V		8
4. Power supply connection		
1) External (standard)		1
2) Internal from voltage input		2
Line 2: Not available for rated frequency 16 2/3 Hz and applications A15 / A16 / A24 (see Table 6)		
Caution: The power supply voltage must agree with the input voltage (Table 6)!		
5. Full-scale output signal, output A		
1) Output A, Y2 = 20 mA (standard)		1
9) Output A, Y2 [mA]		9
Z) Output A, Y2 [V]		Z
Line 9: Full-scale current Y2 [mA] 1 to 20		
Line Z: Full-scale voltage Y2 [V] 1 to 10		
6. Full-scale output signal, output B		
1) Output B, Y2 = 20 mA (standard)		1
9) Output B, Y2 [mA]		9
Z) Output B, Y2 [V]		Z
7. Full-scale output signal, output C		
1) Output C, Y2 = 20 mA (standard)		1
9) Output C, Y2 [mA]		9
Z) Output C, Y2 [V]		Z
8. Full-scale output signal, output D		
1) Output D, Y2 = 20 mA (standard)		1
9) Output D, Y2 [mA]		9
Z) Output D, Y2 [V]		Z
9. Test certificate		
0) None supplied		0
1) Supplied		1
10. Programming		
0) Basic		0
9) According to specification		9
Line 0: Not available if the power supply is taken from the voltage input		
Line 9: **All the programming data must be entered on Form W 2387e and the form must be included with the order.**		

SINEAX DME 424/442
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Table 6: 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 [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 [V]	U93	U93	U93
Lines U01 to U06: Only for single phase AC current or 4-wire, 3-phase symmetric load Line U91: Ur [V] 57 to 400 Line U93: Ur [V] > 100 to 693			
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 > 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	W9	W9	W9
Line W9: Specify transformer ratio prim./sec., e.g. 1000/5 A; 33 kV/110 V			

** Basic accuracy 0.5 c*

Table 6 continued on next page!

Continuation “Table 6: Programming for types DME 424 and 442”

Description				Application		
				A11 … A16	A34	A24 / A44
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 ≤ X0 ≤ 0.9 · X2	0.8 · Ur ≤ X2 ≤ 1.2 · Ur*	AA901	—	—
U1N	L1-N	0 ≤ X0 ≤ 0.9 · X2	0.8 · Ur/√3 ≤ X2 ≤ 1.2 · Ur/√3 *	—	—	AA902
U2N	L2-N	0 ≤ X0 ≤ 0.9 · X2	0.8 · Ur/√3 ≤ X2 ≤ 1.2 · Ur/√3 *	—	—	AA903
U3N	L3-N	0 ≤ X0 ≤ 0.9 · X2	0.8 · Ur/√3 ≤ X2 ≤ 1.2 · Ur/√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
Q2	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 ≤ X2 ≤ 1.2 · Ur*	—	—	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.*

Table 6 continued on next page!

SINEAX DME 424/442
Programmable multi-transducers

Continuation “Table 6: Programming for types DME 424 and 442”

Description	Application A11 … A16	Application A34	Application A24 / A44
6. Output signal, output A			
initial value Y0 / final value Y2			
DC current: Y0 = 0, Y2 = 20 mA	AB01	AB01	AB01
DC current: –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 ..

Table 6 continued on next page!

Continuation “Table 6: Programming for types DME 424 and 442”

Description	**Application**		
	A11 … A16	**A34**	**A24 / A44**
Only for type DME 442			
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 ..
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

Table 6 continued on next page!

Continuation "Table 6: Programming for types DME 424 and 442"

Description	Application A11 … A16	A34	A24 / A44
21. **Measured variable, output E** (continuation)			
Limit contact I			
Limit value XI			
U System 0 ≤ XI ≤ 1.2 · Ur	EA901	—	—
U1N L1-N 0 ≤ XI ≤ 1.2 · Ur/√3	—	—	EA902
U2N L2-N 0 ≤ XI ≤ 1.2 · Ur/√3	—	—	EA903
U3N L3-N 0 ≤ XI ≤ 1.2 · Ur/√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
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 L3 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 ≤ XI ≤ 1.2 · Ur	—	—	EA947

Table 6 continued on next page!

Continuation “Table 6: Programming for types DME 424 and 442»

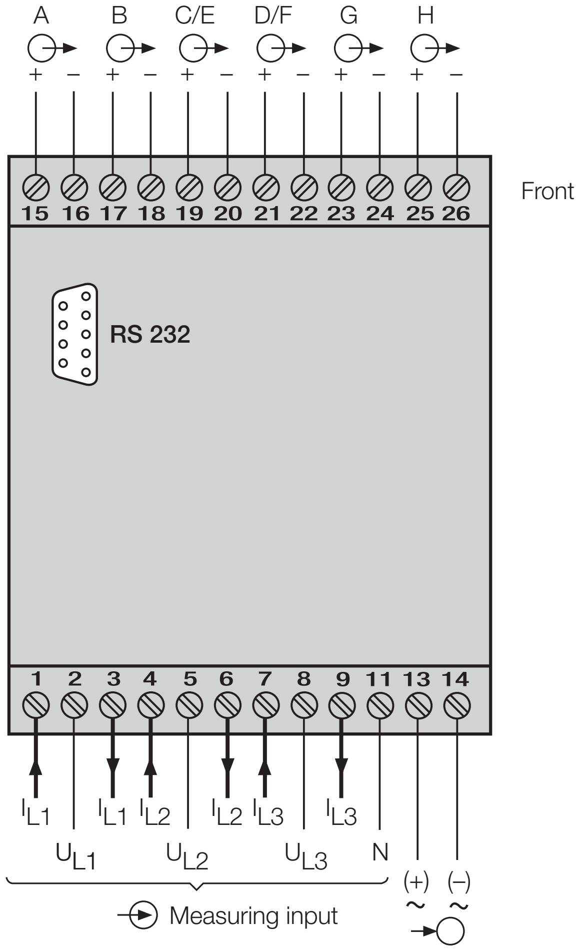
Description	**Application** **A11 … A16**	**A34**	**A24 / A44**
22. Output signal, output E (only for EA901 … EA947) ON if / OFF if X1 > X1 / X1 < X1 X1 < X1 / X1 > X1	 EB01 EB02	 EB01 EB02	 EB01 EB02
23. Pick-up delay, output E (only for EA901 … EA947) Minimum 1 ≤ Y Del ≤ 30 s	 EC01 EC91	 EC01 EC91	 EC01 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 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 ..
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 limits can be assigned to digital outputs G and H using the programming software.

SINEAX DME 424/442
Programmable multi-transducers

Electrical connections

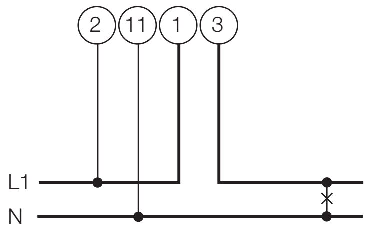
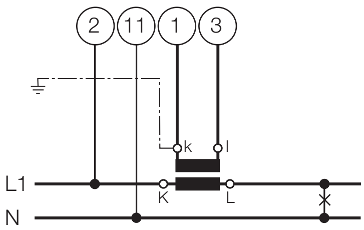
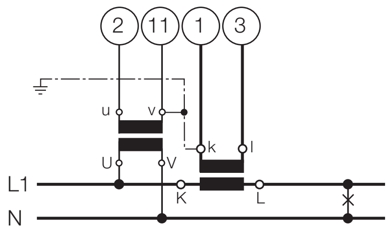
Function				Connection
Meas. input	AC current		IL1	1 / 3
			IL2	4 / 6
			IL3	7 / 9
	AC voltage		UL1	2
			UL2	5
			UL3	8
			N	11
Outputs	Analogue	Digital		
	A		+	15
			–	16
	B		+	17
			–	18
	C	E	+	19
			–	20
	D	F	+	21
			–	22
		G	+	23
			–	24
		H	+	25
			–	26
Power supply	AC		~	13
			~	14
	DC		+	13
	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



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

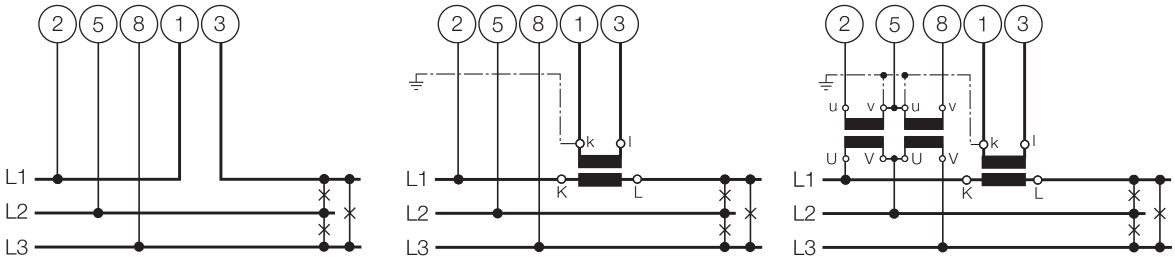
Application (system)	Internal connection Terminal / System
Single phase AC current	2 / 11 (L1 – N)
4-wire 3-phase symmetric load	2 / 11 (L1 – N)
All other (apart from A15 / A16 / A24)	2 / 5 (L1 – L2)

Measuring input

System / application	Terminals		
Single-phase AC system			

Measuring input	
System / application	Terminals

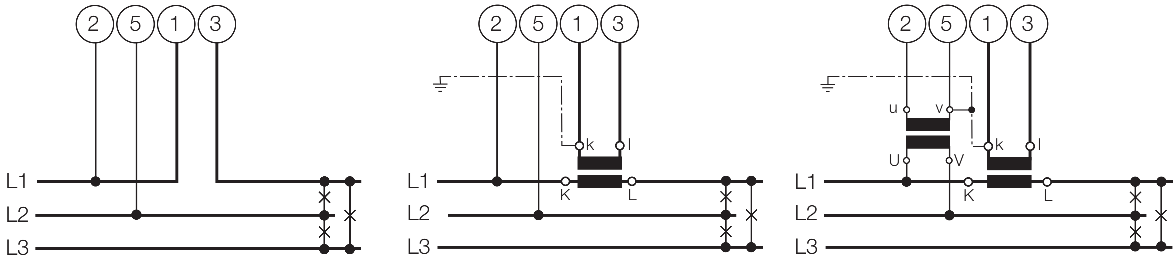
3-wire
3-phase
symmetric load
I: L1



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

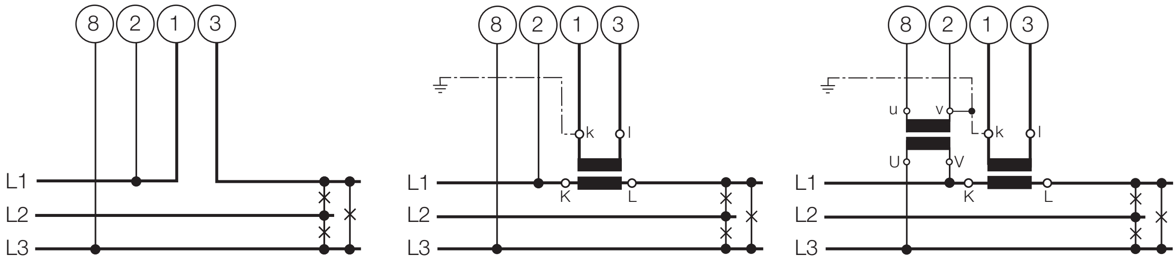
3-wire
3-phase
symmetric load
Phase-shift
U: L1 – L2
I: L1



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:

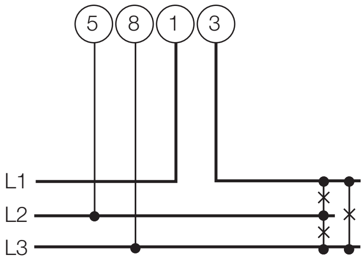
Current transformer	Terminals		8	2
L2	1	3	L1	L2
L3	1	3	L2	L3

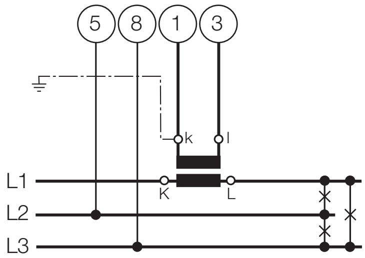
SINEAX DME 424/442
Programmable multi-transducers

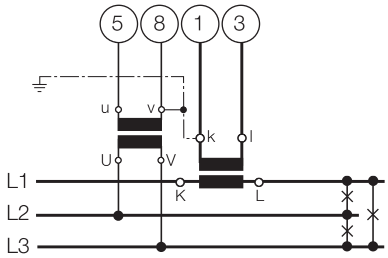
Measuring input

System / application	Terminals

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



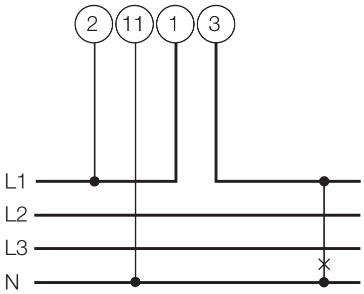


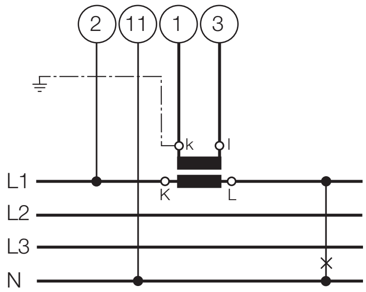


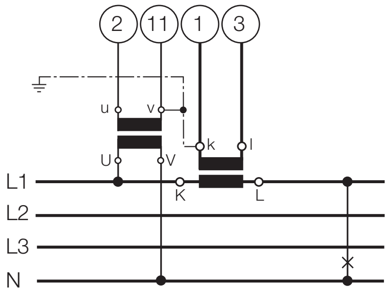
Connect the voltage according to the following table for current measurement in L2 or L3:

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

4-wire
3-phase
symmetric load
I: L1



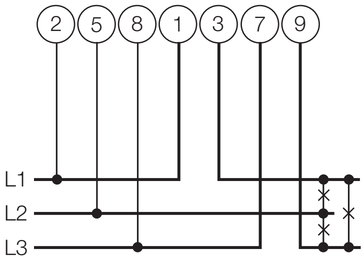


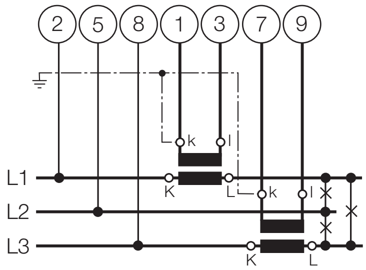


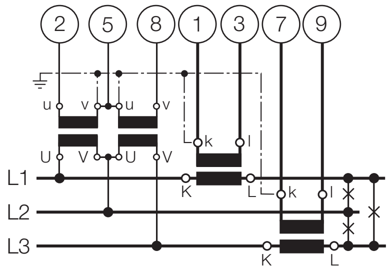
Connect the voltage according to the following table for current measurement in L2 or L3:

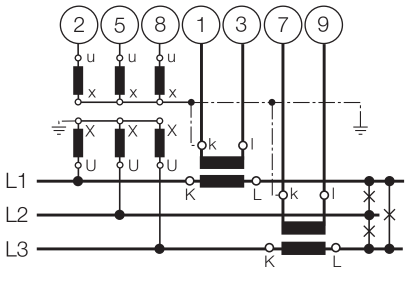
Current transformer	Terminals		2	11
L2	1	3	L2	N
L3	1	3	L3	N

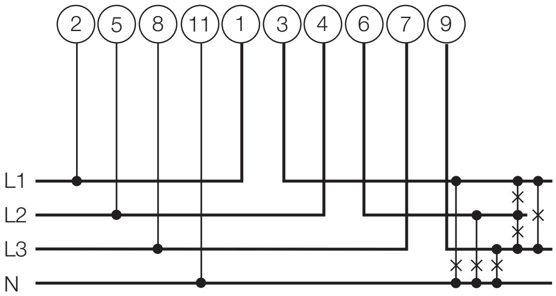
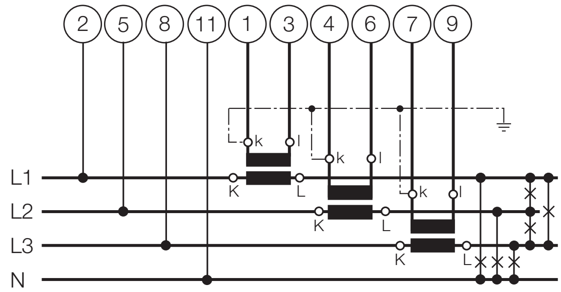
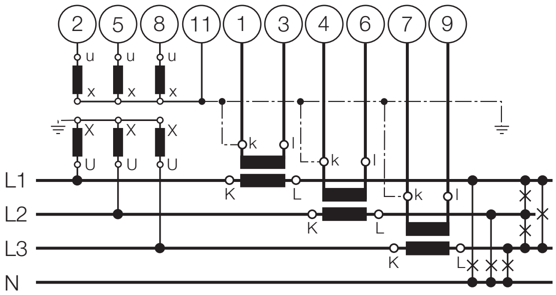
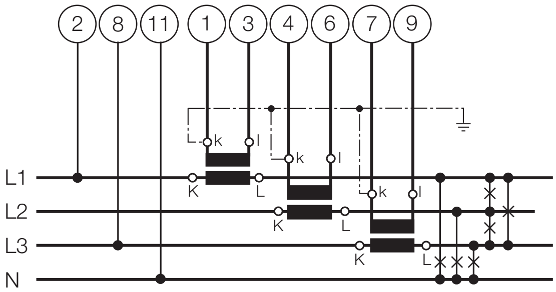
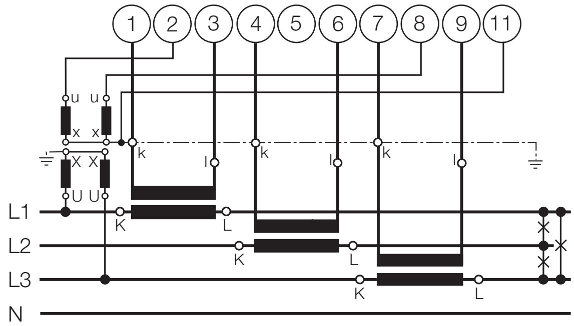
3-wire
3-phase
asymmetric load









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

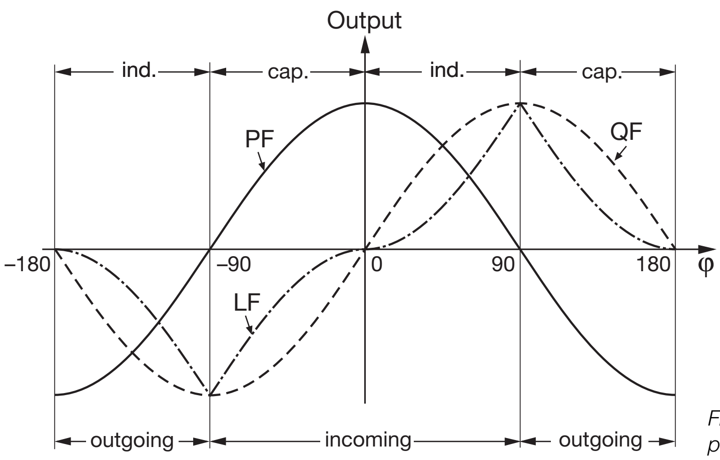


Fig. 5. Active power PF ——, reactive power QF ------, power factor LF –·–·–·.

SINEAX DME 424/442
Programmable multi-transducers

Dimensioned drawings

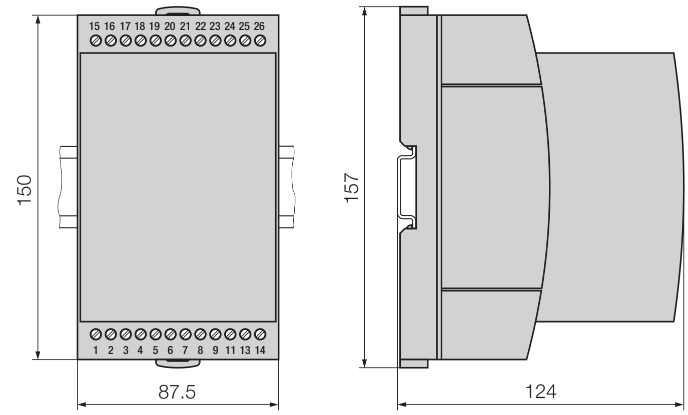


*Fig. 6. SINEAX DME 424/442 in housing **T24** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022).*

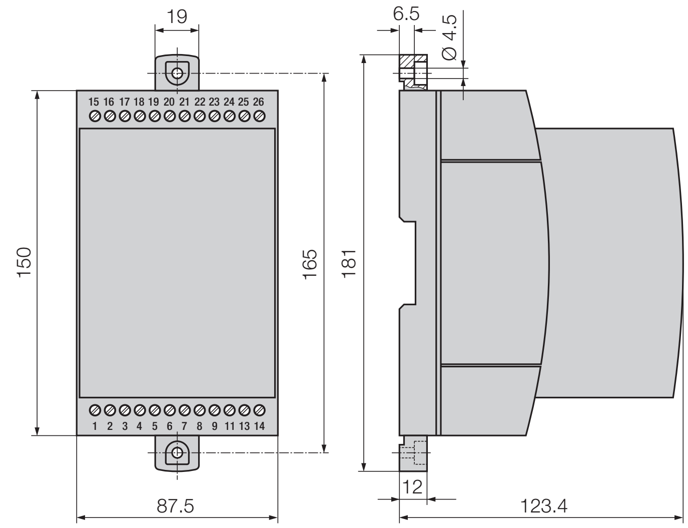


*Fig. 7. SINEAX DME 424/442 in housing **T24**, screw hole mounting brackets pulled out.*

Table 7: Accessories

Description	Order No.
Programming cable	980 179
PC software DME 4 (in German, English and French on two 3 1/2″ discs)	131 144
Operating Instructions DME 424/442-1 Bd-f-e	122 250

Standard accessories

1 Operating Instructions in three languages: German, French, Englisch

1 blank type label for recording programmed settings

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PROGRAMMING FOR SINEAX TYPE DME 424

with 2 analogue and 4 digital outputs
(see Data Sheet DME 424/442-1 Le, Table 6: “Programming for types DME 424 and 442”)

GOSSEN METRAWATT CAMILLE BAUER

Customer / Agent: ____________________ Date: ____________________

Order No. / Item: ____________________ Delivery date: ____________________

No of instruments: ____________________

Type of instrument (marking): ____

____

A ☐☐	**1. Application** System ____________________
U ☐☐	**2. Input voltage, rated value** Ur = ____________________
V ☐	**3. Input current, rated value** Ir = ____________________
W ☐	**4. Primary transformer** 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

Continued on next page!

	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

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GOSSEN METRAWATT CAMILLE BAUER

PROGRAMMING FOR SINEAX TYPE DME 442

With 4 analogue and 2 digital outputs
(see Data Sheet DME 424/442-1 Le, Table 6: "Programming for types DME 424 and 442")

GOSSEN METRAWATT CAMILLE BAUER

Customer / Agent: ______________________ Date: ______________________

Order No. / Item: ______________________ Delivery date: ______________________

No of instruments: ______________________

Type of instrument (marking): ______________________

____

A	**1. Application** System ______________________
U	**2. Input voltage, rated value** Ur = ______________________
V	**3. Input current, rated value** Ir = ______________________
W	**4. Primary transformer** 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 = ________

Continued on next page!

	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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