

Energy and Power Disturbance Analyzers

MAVOWATT® 45

3-Phase Energy and Power Disturbance Analyzer for Stationary or Mobile Use



This portable device is designed for the measurement of electrical quantities in DC systems, as well as in single and three-phase AC systems at any load up to 400 Hz. Measurement at frequency converter outputs (motor controllers) is also possible with the TCM option.

The spectrum of functions ranges from acquisition, display and recording of measured quantities by means of recognition and evaluation of fluctuations and other power supply interference factors (optional harmonics and power disturbance analysis), right on up to analysis and recording of energy consumption. In industry as well, a wide range of potential applications exists. For example, it can serve as an accurate measuring instrument with recording functions for the determination of characteristic quantities from electrical load components or generators in steady-state, as well as during dynamic processes. Or it can function as a tester with the FFT option, by means of which it compares harmonic current from power consumers with prescribed limit values. Its compact, rugged design makes the MAVOWATT 45 suitable for stationary operation as well as mobile applications.

- Options:
- MAVO-FFT: Harmonic Analysis (see page 32)
 - MAVO-PDA: Power Disturbance Analysis (see page 32)
 - MAVO-TCM: Acquiring Transients / Frequency Converter Measurements (see page 33)
 - MAVO-FSA: Flicker Measurement per EN 61000-4-15 (see page 33)

- Dimensions: 150 x 290 x 290 mm, weight: 4.0 kg

Standard equipment included with the MAVOWATT 45L:

Energy and power disturbance analyzer, 3-phase, with RS 232 interface, slot for memory card, includes 3 pairs of measurement cables with test probes and plug-in alligator clips, 4 short measurement cables with plugs for safety sockets, power cable, RS 232 interface cable, floppy disk with firmware for menu languages, F2000 universal carrying pouch, operating instructions

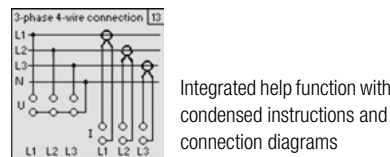
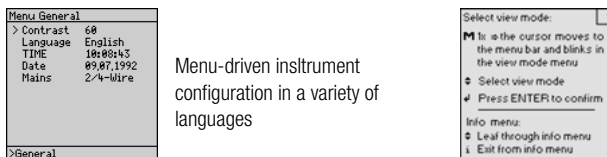
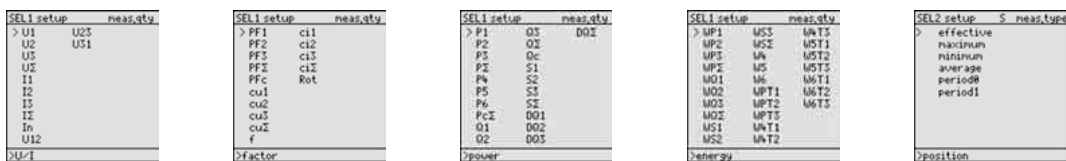
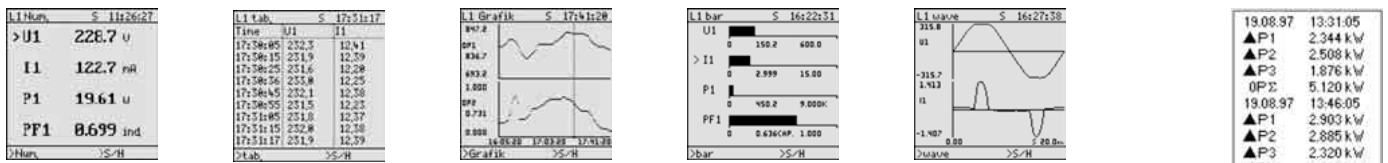
Standard equipment included with the MAVOWATT 45S:

Same as MAVOWATT 45 L, plus enabling of FFT, PDA, TCM and FSA options and three Z823B clip-on current-voltage transformers, in K45 test case

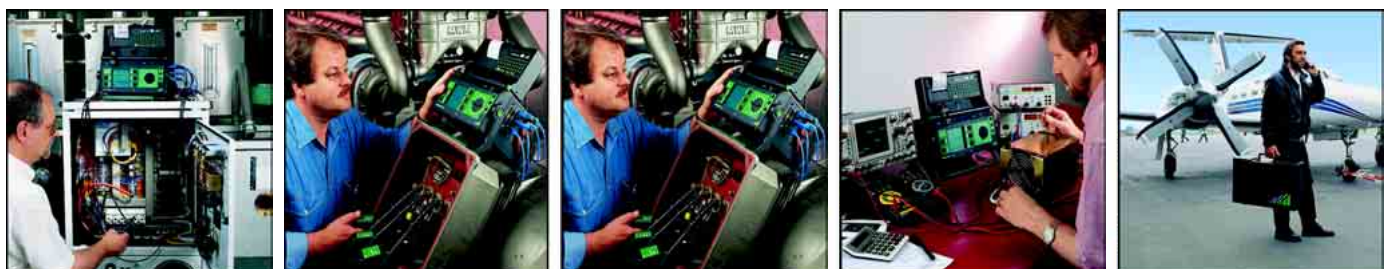
➔ See page 5 for training seminar: GTT1641

Type	Data Sheet No.	Article Number		
MAVOWATT 45L	3-348-795-03	M815C		
MAVOWATT 45S	3-348-795-03	M815E		
K45 hard case	3-348-795-03	Z845C		

Plain text display at large dot matrix LCD



Measurement data can be recorded to the plug-in memory card or to recording chart paper at the integrated printer module.



Energy and Power Disturbance Analyzers

MAVO-FFT

Harmonic Analysis Software Option

FFT Num.	THD-I %	THD-U %
L1	35,7	3,7
L2	35,6	3,7
L3	32,3	3,7
	P M	f Hz
L1	1,697k	49,99
L2	1,721k	49,99
L3	1,784k	49,99



DIN EN 50160	
U11	12
U21	0
U31	0

This option expands the MAVOWATT 45 with simultaneous acquisition, display and analysis of voltage and/or current harmonics.

DC components, fundamental components and current and voltage harmonics (up to the 50th harmonic relative to a fundamental frequency of 15 to 400 Hz) are continuously and uninterruptedly acquired and calculated by means of the fast Fourier transformation process in real-time at all three phases, and are represented as numeric values or as a bar graph for the selected phase.

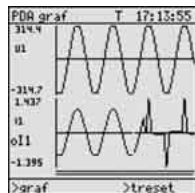
Alternatively, measured values for respective THD (total harmonic distortion) for all three phases for voltage and current can be simultaneously numerically displayed or statistically classified.

Type	Data Sheet No.	Article Number		
MAVO-FFT	3-348-795-03	Z850B		

MAVO-PDA

Power Disturbance Software Option

	U1	U2	U3
o	0	0	0
u	174	0	0
d	0	0	0
THD	0	0	0
sy	0	0	0
of	0	0	0
uf	0	0	0



PDR Event	S	#1:#8:13
#1:#8:12	o13	2,402
#1:#8:12	o12	2,388
#1:#8:12	o11	2,404
#1:#8:11	o13	2,402
#1:#8:11	o12	2,388
#1:#8:11	o11	2,404
#1:#8:11	o13	2,402
#1:#8:11	o12	2,388
#1:#8:11	o11	2,404
#1:#8:10	o13	2,402

Power disturbance analysis methods which allow for uninterrupted monitoring and classification of disturbances within electrical supply lines are taken advantage of by the MAVOWATT 45.

Measured quantities (RMS voltage and current values, frequency and THD) which have been acquired during 2, 4, 8 or 16 signal periods at all phases, or at selected phases only, are continuously compared with the respective, individually preset trigger criteria (upper limit for U/I/THDU/ THDI/f, lower limit for U/I/f, fluctuation value for U/I).

Individual or simultaneously occurring events are recorded uninterruptedly and are combined and represented in three different tables: number and type of voltage and frequency disturbance events within an adjustable interval period, number and type of current disturbance events within an adjustable interval period, events list including time, cause and measured value. If uninterrupted data logging is not required, the voltage and current signal pattern can be displayed as well with high time-resolution when an event occurs. In this way, important line voltage characteristics can be documented as required by EN 50160, and power consumer making-operations can, for example, be analyzed.

Type	Data Sheet No.	Article Number		
MAVO-PDA	3-348-795-03	Z851B		

MAVO-TCM

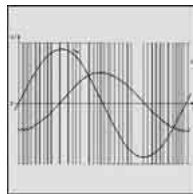
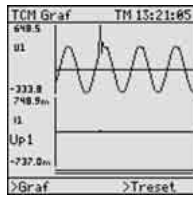
Software Option for Transient Capture and Frequency Converter Measurements

```

menu general
contrast 60
language english
time 11:34:37
date 05.10.1997
mains 2/4-Wire
> TCM on
    
```

```

TCM Setup E 16:41:39
> Up / U 400.00
dU / U/ms 150.00
Ip / A .00000
dI / A/ms .00000
sample / us 40
Drucker aus
Intervall 0001
    
```



MAVO-TCM expands the scope of functions included with the MAVOWATT 45 to include two special facilities for mains power measuring technology:

- On the one hand, brief transient events can be captured which occur in alternating or direct current power supply lines, as well as at power consumers connected to them.
- On the other hand, the instrument is capable of acquiring measured quantities for power and energy analysis at frequency converter outputs.

Transient Measurement

Voltage transients with a duration of at least 20 μ s can be acquired, and measured at levels of up to 1500 V_s . Trigger conditions for events recording are derived from a comparison of the absolute level of a sampled value and the selected trigger level (Up or Ip). A rate of change trigger is active as well. The sampling interval (20 μ s to 640 μ s) and the pre-trigger can also be adjusted.

The event display mode can be used for recording rapidly occurring, successive events. This allows for recording of up to 40 events per second listed in the order in which they occur along with time stamp, cause of triggering, measured quantity and sampled or rate-of-change measured value.

Measurements at Frequency Converters

Modern frequency converters used for controlling electric motor speed usually have a high frequency square-wave output voltage which is pulse-width modulated via motor frequency.

This type of measurement signal requires a special measuring process, by means of which the converter switching frequency is filtered out, and the effective modulation frequency at the motor (fundamental frequency) is determined.

- Switching frequency must be greater than 1.2 kHz, and fundamental frequency within a range 10 to 100 Hz.
- Motor current is acquired in an electrically isolated fashion, e.g. with a clip-on ammeter.

Type	Data Sheet No.	Article Number		
MAVO-TCM	3-348-795-03	Z851C		

MAVO-FSA

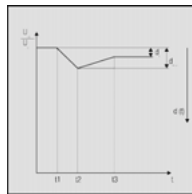
Flicker Measurement Software Option

```

menu general
contrast 60
language english
time 11:34:37
date 05.10.1997
mains 2/4-Wire
TCM off
> flicker on
    
```

```

FlickerNum, S 10:49:45
29 L1 L2 L3
Pst 0,250 0,000 0,000
dmax /% 0,79 0,00 0,00
dc /% 0,75 0,00 0,00
dt>3% /s 0,00 0,00 0,00
100
Plt 0,205 0,000 0,000
>Num, >S/H
    
```



MAVO-FSA expands the MAVOWATT 45 to include a flicker meter function.

Flicker is defined as the subjective impression made by fluctuations in brightness at lighting appliances caused by fluctuations in the power supply. Fluctuations of this sort can be acquired and evaluated with the help of a flicker meter. EN 61000-4-15 defines the basic functional principle of a flicker meter, which simulates the complex chain of events which takes place at the lamp, the eye and the brain, and which correlates measurement results to an experimentally determined limit value curve (perceptual limits).

Values for the resulting measured quantities, Pst (short-term flicker intensity, 10 min.) and Plt (long-term flicker intensity, 2 hours) are simultaneously determined for all three phase voltages on an individual basis. An evaluation of line voltage quality as regards flicker can be carried out in accordance with EN 5016 based upon these measured values.

Furthermore, the function also acquires the largest relative voltage fluctuation (dmax) which occurs during the short-term measuring interval, relative constant voltage fluctuation (dc) and, for voltage changes of greater than 3%, the maximum deviation duration (dt > 3%).

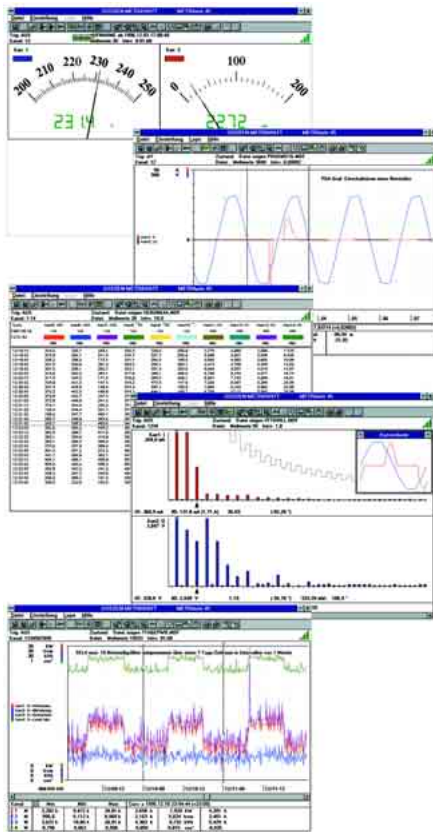
These measured quantities are required for type testing for electrical devices per EN 61000-3-3.

Observance of the limit values set forth in this standard is required as of 1 January 2001 for application of the CE mark to electrical and electronic equipment and devices with input current of up to 16 A.

Type	Data Sheet No.	Article Number		
MAVO-FSA	3-348-795-03	Z851D		

Energy and Power Disturbance Analyzers

METRAwin® 45



Analysis Software for MAVOWATT 45

METRAwin 45 Windows software allows for read-out, display and processing of measurement data from the MAVOWATT 45 at a PC.

Uploading of data can be accomplished online (does not apply to optional measurements), or from the memory card via the device's RS 232 interface. Measurement data can be represented and printed out numerically in tabular form, as a Yt graph or as an FFT frequency spectrum, and exported to other Windows applications.

Yt Recorder

Acquired measured values from up to six freely selectable channels are displayed at the screen as a line diagram with a horizontal time axis and are measured off with the cursor. Stored signals can be expanded or compressed along amplitude or time axes (zoom function).

High Speed Yt Recorder

Voltage and current signals recorded at the MAVOWATT 45 with the PDA/TCM graph function can be analyzed with a time resolution of up to 20 μ s.

Multimeter

Transmitted measured values from up to four freely selectable channels are displayed at the monitor in the online mode in digital format with an additional analog scale, or as an analog indicator with additional digital display.

Table

Acquired measured data from up to 10 channels are displayed numerically in clear-cut tabular format. Measured values can be exported to other programs via the clipboard.

FFT Frequency Spectrum

Harmonic measurement data recorded at the MAVOWATT 45 with the FFT function are displayed as a frequency spectrum with vertical bars. Limit value marker lines, as well as reconstructed waveshapes, can be displayed for various standards or in a user-defined fashion.

System Requirements:

MS Windows 95, 98, ME, NT, 2000 or XP

Type	Data Sheet No.	Article Number		
METRAwin 45	3-348-795-03	Z852B		

MAVO-RC8 Memory Card



Plug-In Measured Value Memory for Long-Term Recording

Measurements from all of the MAVOWATT 45 analysis functions can be saved to a PCMCIA flash RAM adapter for non-volatile storage. Stored values can be viewed at the display.

However, METRAwin 45 software is recommended for the analysis of long-term measurement value recordings. The MAVO-RC 8 memory card has 8 MByte of capacity (approximately 2 million measured values).

Type	Data Sheet No.	Article Number		
MAVO-RC8	3-348-795-03	Z845D		

SECUTEST PSI Printer Module



Integratable Printer-Memory Module for Rapid On-Site Report Generation

Measurement results, events and device settings are transmitted to the PSI module, which can be integrated into the lid of the MAVOWATT 45, via a ribbon cable and are printed onto recording chart paper. Printing can be started manually, or can be measured-value or time triggered.

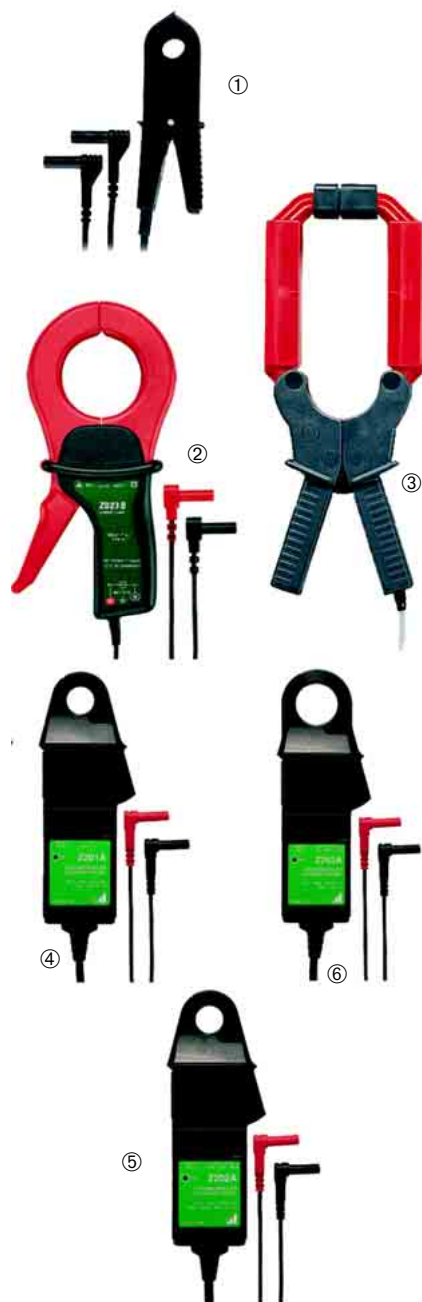
Consumable materials: PS-10P = pack of 10 recording charts, Z3210 = pack of 10 printer ribbon cartridges

- Dimensions: 240 mm x 81 mm x 40 mm (without knurled screws and ribbon cables), weight: approx. 0.8 kg
- Power supply: via the MAVOWATT 45

Type	Data Sheet No.	Article Number		
SECUTEST PSI module	3-348-785-03	GTM5016000R0001		
PS-10P	3-348-785-03	GTZ3229000R001		
Z3210	3-348-785-03	GTZ3210000R001		

Current Measuring Accessories for the MAVOWATT 45

Clip-On Current-Voltage Transformers, Current Sensors, Shunt Resistors



- WZ12E: mini clip-on current sensor 0.2 ... 150 A_{eff}, 10 mV/A, frequency range: 30 ... 500 Hz
- WZ12F: mini clip-on current sensor 0.02 ... 15 A_{eff}, 100 mV/A, frequency range: 30 ... 500 Hz
- Z202A: active clip-on current-voltage transformer with battery, 0 ... 30/300 A_{eff}, 0 ... 20/200 A_{eff}, 10 mV/A or 1 mV/A, frequency range: DC ... 10 kHz
- Z203A: active clip-on current-voltage transformer with battery, 0 ... 300/1000 A_{eff}, 0 ... 200 / 1000 A_{eff}, 1 mV / A, frequency range: DC ... 10 kHz
- Z823B: passive clip-on current-voltage transformer, 1 ... 1000 A_{eff}, output: 0 ... 1 V, frequency range: 45 Hz ... 10 kHz
- Z821B: passive clip-on current-voltage transformer, 1 ... 3000 A_{eff}, output: 0 ... 1 V, frequency range: 30 Hz ... 5 kHz
- AF033A: Ampflex flexible current sensor, 0.5 ... 30/300 A_{eff}, 100 mV/A or 10 mV/A
- AF33A: Ampflex flexible current sensor, 0.5 ... 300/3000 A_{eff}, 1 mV/A or 0.1 mV/A
- AF101A: Ampflex flexible current sensor, 5 ... 1000/10000 A_{eff}, 1 mV/A or 0.1 mV/A
- AF11A: Ampflex flexible current sensor, 5 ... 1000 A_{eff}, 1 mV/A
- Z860A: shunt resistor, 20 mA/1 V (class 0.2)
- Z861A: shunt resistor, 1 A/1 V (class 0.2)
- Z862A: shunt resistor, 5 A/250 mV (class 0.2)
- Z863A: shunt resistor, 16 A/160 mV (class 0.2)

Ranges of use for measuring accessories:

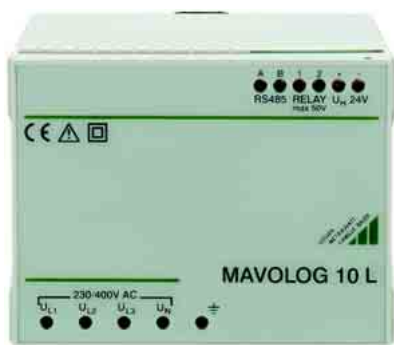
Type	Suitable for *	Measuring range **		Figure
		Nominal Value	Usable Range with MAVOWATT 45	
WZ12F	A, (C)	AC: 15 A _{eff}	approx. 0.02 ... 15 A _{eff}	①
WZ12E	A, (C)	AC: 150 A _{eff}	approx. 0.2 ... 150 A _{eff}	①
Z201A	B, C	AC: 20 A _{eff} DC: 30 A	approx. 0.1 ... 17 A _{eff} approx. 0.1 ... 24 A	④
Z202A	B, C	AC: 20 A _{eff} / AC: 200 A _{eff} DC: 30 A / DC: 300 A	prox. 0.1 ... 20 A _{eff} / prox. 1 ... 200 A _{eff} approx. 0.1 ... 30 A / approx. 1 ... 300 A	⑤
Z203A	B, C	AC: 200 A _{eff} / AC: 1000 A _{eff} DC: 300 A / DC: 1000 A	prox. 1 ... 200 A _{eff} / prox. 1 ... 1000 A _{eff} approx. 1 ... 300 A / approx. 1 ... 1000 A	⑥
Z823B	A, B, (C)	AC: 1000 A _{eff}	approx. 1 ... 1200 A _{eff}	②
Z821B	A, B, (C)	AC: 3000 A _{eff}	approx. 1 ... 3000 A _{eff}	③
AF033A	(A), B, C	AC: 30 A _{eff} / AC: 300 A _{eff}	prox. 0.5 ... 17 A _{eff} / prox. 0.5 ... 170 A _{eff}	⑩
AF33A	(A), B, C	AC: 300 A _{eff} / AC: 3000 A _{eff}	prox. 0.5 ... 170 A _{eff} / prox. 0.5 ... 1700 A _{eff}	⑩
AF101A	(A), B, C	AC: 1000 A _{eff} / AC: 10 kA _{eff}	prox. 5 ... 1000 A _{eff} / prox. 5 A ... 10 kA _{eff}	⑩
AF11A	(A), B, C	AC: 1000 A _{eff}	approx. 5 ... 1000 A _{eff}	⑩
Z860A	A, B	AC: 20 mA _{eff} DC: 20 mA	approx. 0.05 ... 32 mA _{eff} approx. 50 μA ... 48 mA	⑦
Z861A	A, B	AC: 1 A _{eff} DC: 1 A	approx. 1 mA _{eff} ... 1 A _{eff} approx. 1 mA ... 1.2 A	⑧
Z862A	A, B	AC: 5 A _{eff} DC: 5 A	approx. 0.02 ... 5 A _{eff} approx. 0.02 ... 5 A	⑨
Z863A	A, B	AC: 16 A _{eff} DC: 16 A	approx. 0.1 ... 16 A _{eff} approx. 0.1 ... 16 A	⑨

*) A = long-term measurements (up to 1 week) / B = harmonics measurements / C = frequency converter measurements (f > 30 Hz)
 **) For AC ranges: with peak factor < 1.5

Type	Data Sheet No.	Article Number		
WZ12F	3-348-795-03	Z823E		
WZ12E	3-348-795-03	Z823D		
Z201A	3-348-795-03	Z201A		
Z202A	3-348-795-03	Z202A		
Z203A	3-348-795-03	Z203A		
Z823B	3-348-795-03	Z823B		
Z821B	3-348-795-03	Z821B		
AF033A	3-348-795-03	Z207A		
AF33A	3-348-795-03	Z207B		
AF101A	3-348-795-03	Z207C		
AF11A	3-348-795-03	Z207D		
Z860A	3-348-795-03	Z860A		
Z861A	3-348-795-03	Z861A		
Z862A	3-348-795-03	Z862A		
Z863A	3-348-795-03	Z863A		

Voltage Quality Analyzers

MAVOLOG® 10L/N/S



3-Phase Voltage Quality Analyzer and Test Instrument for Testing per EN 50160 in Standard Combination Housing

3-phase voltage quality analyzer and test instrument for testing per EN 50160 in standard combination housing including harmonic and flicker analysis

- Monitors voltage quality and simultaneously records 3-phase alternating quantities
- Internal analysis of voltage quality for short-term, daily and long-term intervals per EN 50160 and other industrial standards
- 640 k internal memory, memory capacity can be partitioned for various measuring and test tasks in a user-specific fashion
- RS 485 fieldbus with multi-drop connection for up to 32 devices, alarm output for events indication
- Dimensions: 100 x 75 x 105 mm, weight: 360 g

➤ See page 5 for training seminar: GTT1642

Analyzer Variants

MAVOLOG series instruments have been designed to allow for the selection of ideal configurations for all types of applications, from power generation to consumer applications, in combination with multiple instruments or as a stand-alone. Even the basic model, the MAVOLOG 10L+FFT/FSA, provides for comprehensive disturbance recording and line voltage quality analysis with integrated harmonic analysis (FFT) and flicker measurement (FSA). Equipped with an LCD and additional current inputs, the top of the line MAVOLOG 10S+FFT/FSA is a universal measuring instrument and can be used for recording the characteristics of almost any conceivable measured quantities in 3-phase systems, and simultaneously acquires power disturbances and characteristics for the analysis of voltage quality.

Features	MAVOLOG			
	10L+FFT/FSA	10N+FFT/FSA	10S+FFT/FSA	10S
Voltage				
Measurement inputs	3 x U _{L-L} / U _{L-N} & U _{N-PE}			
Dips, failures	>10 ms	>10 ms	>10 ms	>10 ms
Swells	>10 ms	>10 ms	>10 ms	>10 ms
Asymmetry	●	●	●	●
Frequency	●	●	●	●
Harmonics	1 to 40 & THD	1 to 40 & THD	1 to 40 & THD	–
Flicker (Pst, Plt)	●	●	●	–
EN 50160 analysis	●	●	●	–
Current				
Measurement inputs	–	–	3xI _L & I _N	3xI _L & I _N
Characteristics for voltage dips	–	–	Resolution: 10 ms	Resolution: 10 ms
Harmonics	–	–	1 to 40 & THD	–
Power / Energy				
Active power P _T , P ₂ , P ₃ , P _Σ	–	–	●	●
Apparent power S _Σ	–	–	●	●
Reactive power Q _Σ	–	–	●	●
Power factor PF _Σ	–	–	●	●
Active energy WP _Σ	–	–	●	●
Reactive energy WQ _Σ	–	–	●	●
Alphanumeric LCD				
Measured values, analyses	–	10, selectable	10, selectable	10, selectable
Parameters configuration	–	●	●	●

Type	Data Sheet No.	Article Number		
MAVOLOG 10L+FFT/FSA	3-349-028-03	M830S		
MAVOLOG 10N+FFT/FSA	3-349-028-03	M830P		
MAVOLOG 10S+FFT/FSA	3-349-028-03	M830R		
MAVOLOG 10S	3-349-028-03	M830V		

MAVOLOG® 10 Mobile Set



MAVOLOG Set in Carrying Case for Mobile Use

A practical solution for occasional mobile use: The MAVOLOG Mobile Set consisting of the following components:

- MAVOLOG 10S+FFT/FSA voltage analyzer
- MAVOLOG PS/C power pack and interface converter
- MAVOLOG BP battery pack

Wired and installed in a stable carrying case (46 x 16 x 35 cm)

Included accessories:

- Connector cables for mains power and voltage measurement inputs including alligator clips and RS 232 interface
 - METRAwin 10 for MAVOLOG parameters configuring and analysis software
- The case also provides space for storing optional clip-on current transformers such as 3 ea. Z3512 (1000/1 A).

➤ See page 5 for training seminar: GTT1642

Type	Data Sheet No.	Article Number		
MAVOLOG 10 Mobile Set	–	M830W		

Voltage Quality Analyzers

MAVOLOG® PS/C



230 V~ / 24 V – Power Pack for MAVOLOG Instruments and the MAVOLOG BP, Additionally Integrated RS 485-232 Interface Converter

The MAVOLOG PS/C module (PS = power supply / C = converter) includes a mains power pack with 24 V DC output for supplying power to as many as five MAVOLOG 10 instruments and one MAVOLOG BP, as well as a bidirectional RS 232-485 interface converter for communications between a PC and MAVOLOG control software. Up to 32 MAVOLOG 10 instruments can be connected to the RS 485 bus, which can have a length of up to 1 km, and which runs at a maximum data transmission rate of 115 kBaud.

The standard version is laid out for an input voltage of 230 V AC.

- Dimensions: 75 mm x 55 mm x 111 mm (H x W x D), weight: approx. 800 gr.

The MAVOLOG PS/C universal variant (above figure) has a broad range input for 60 to 230 V AC / DC.

- Dimensions: 75 mm x 100 mm x 111 mm (H x W x D), weight: approx. 350 gr.

Type	Data Sheet No.	Article Number		
MAVOLOG PS/C	3-349-045-03	Z863D		
MAVOLOG PS/C universal	–	Z863G		

MAVOLOG® BP



Battery Pack as Emergency Backup for MAVOLOG Instruments in the Event of Power Failure

The MAVOLOG BP (BP = battery pack) is an uninterruptible DC power supply which, in combination with the MAVOLOG PS/C, automatically supplies power to connected MAVOLOG 10 instruments in the event of mains power failure. Depending upon the number and type of instruments, they can be operated with a fully charged backup battery for up to 10 hours. Integrated electronics regulate and monitor the charging process, assuring reliable availability of supply power and long backup battery service life.

- Dimensions: 75 mm x 55 mm x 109 mm (H x W x D), weight: approx. 480 gr.

Type	Data Sheet No.	Article Number		
MAVOLOG BP	3-349-044-03	Z863E		

MAVOLOG® Dial-Up



Analog Modem for Long Distance Data Transmission in Standard Combination Housing

The MAVOLOG analog dial-up modem connects the installed MAVOLOG mains monitoring system to a master computer via public telephone lines for remote parameters configuration, control and data queries. An SMS message can be transmitted to a cell phone, a fax machine etc., in the event of power disturbance.

- Dimensions: 75 mm x 45 mm x 110 mm (H x W x D), weight: approx. 230 gr.

- Power supply: 10 ... 60 V~, e.g. with the MAVOLOG PS/C

Additional modems upon request, e.g. for ISDN, GSM and Ethernet

Type	Data Sheet No.	Article Number		
MAVOLOG Dial-Up	–	Z864C		

MAVOLOG® C232/485



RS 232 <-> 485 Interface Converter

The MAVOLOG C232/485 is designed for use with MAVOLOG 10 series instruments. It includes an RS 232 <-> RS 485 interface converter for communications between a PC with METRAWin control software and the individual instruments. Up to 32 MAVOLOG instruments can be connected to the RS 485 bus.

The battery powered interface converter is bidirectional with automatic switching, although the communications direction is not electrically isolated.

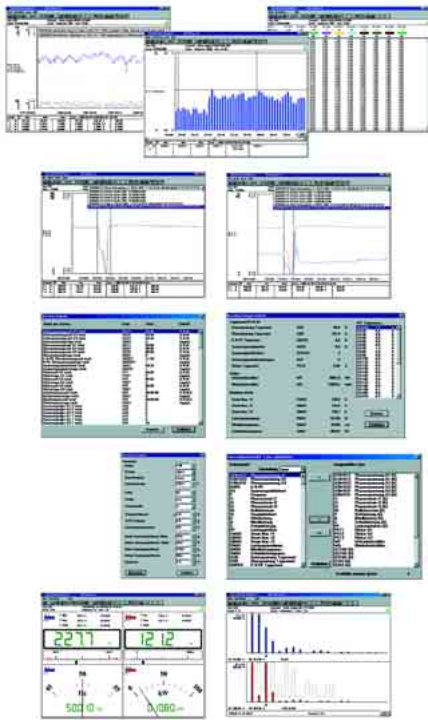
If a MAVOLOG PS/C is not used, it can be utilized for supplying power to the MAVOLOG 10, if the MAVOLOG 10 is only read out occasionally with a notebook, for example after the occurrence of power disturbances.

- Dimensions: 102 mm x 61.5 mm x 26 mm (H x W x D), weight: approx. 200 gr. with batteries
- 9 V flat cell, IEC 6 LF 22

Type	Data Sheet No.	Article Number		
MAVOLOG C232/485	–	Z863F		

METRAwin 10 / MAVOLOG

Parameters Configuration and Visualization Software



METRAwin for MAVOLOG 10 software is used for configuring parameters and visualizing data from the MAVOLOG 10. It includes the following functions:

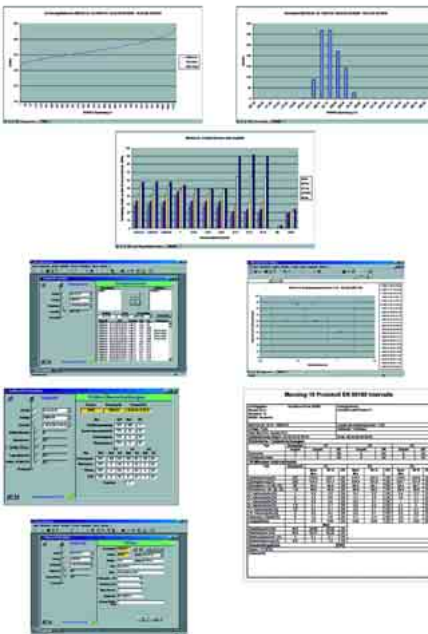
- Configuration of device parameters (hook-up configuration, memory parameters)
- Memory mode initialization
- Read-out and print-out of complete statistics, as well as daily statistics
- Read-in and graphic representation of interval data
- Read-in and representation of events data in list format, as well as graphic representation of 10 ms RMS values from respective event curves
- Read-in and graphic representation of harmonics
- Online visualization of selected measured quantities
- Interval data or measurement series recorded on line are displayed at the monitor as a line diagram or a bar graph with horizontal time axis and can be analyzed with two pointers.
- The data-logger display shows time and measured values numerically in an easy to read table, and allows for data export to other programs with the Windows clipboard.
- Event data read out from one or several MAVALOGs are listed in the order in which they occurred, and can be printed as an events list.
- In the event of voltage dips, failure or swells, these are displayed in a time sequence which can be measured off with cursors. If the current signal is simultaneously available, conclusions can be drawn regarding the causes of disturbances.
- Complete statistics and daily maximum values provide information concerning all important factors at a single glance.
- Parameters configuration for interconnected instruments as regards the measuring circuit, recording parameters, memory configuration etc., is accomplished by means of a menu-driven process.
- In the online mode, up to ten selectable measured quantities can be scanned and recorded once every second.

System Requirements: MS Windows 95, 98, ME, NT, 2000 or XP

Type	Data Sheet No.	Article Number		
METRAwin10/MAVOLOG	—	Z852D		

PC.doc-ACCESS/MAVOLOG

Software for Generating Reports and Graphics



PC.doc-ACCESS for MAVOLOG 10 is a database program based on Microsoft Office products including WinWord, Excel and Access for the management, presentation and documentation of data recorded with the MAVOLOG 10. The software allows for the management of data from any number of MAVOLOG 10 instruments, and for interactive or automatic, time controlled querying with the help of a scheduler. In this way, the software allows for comprehensive, detailed long-term analysis of voltage quality within a power supply system with numerous measuring stations.

Graphics Processing with MS Excel

- Sorting of measured values according to time of occurrence, size (ascending/descending) and frequency distribution
- Data analysis (with minimum values/mean values/95%/maximum values) in compliance with EN 50160 and with adjustable limit values
- Time sorted lists of recorded events from several MAVOLOG 10 instruments during an adjustable observation period
- Analysis of voltage dips with reference to standardized limits/classes (ITIC=CBEMA, NRS048)
- Print-out of events list with explanatory remarks
- Analysis of statistical data with reference to EN 50160 and adjustable limit values
- Report printing with Go/No-Go evaluation in MS Word
- Scheduler for time controlled remote read-out from MAVOLOG 10 instruments with the help of METRAwin 10 software via RS 232 interface or modem, or via Ethernet with a slave PC as gateway

System Requirements: MS Windows 95, 98, ME, NT, 2000 or XP

MS-Office Professional 97/2000

Type	Data Sheet No.	Article Number		
PC.doc-ACCESS / MAVOLOG	—	Z852F		

