# MAVOWATT | 20

**Energy and Power Analyzer** 

# Features

- 4 voltage inputs up to 600 V RMS, 4 current inputs
- Intuitive operation with color touch-screen
- Harmonic analysis up to the 63<sup>rd</sup> harmonic
- Automatic limit value settings
- Built-in uninterruptible power supply battery for up to 3 hours of operation





# Description

The MAVOWATT 20 is a high performance, but nevertheless easy to use measuring instrument for comprehensive energy and power analysis at single and 3-phase energy systems.

It's extremely well suited for testing energy saving systems, acquiring energy consumption values and costs, determining the efficiency of photovoltaic inverters, and for harmonic analysis.

You can create test reports quickly and automatically with the help of free EPRW software, which can be exported to Excel or Word by simply pressing an key. Furthermore, the MAVOWATT 20 supports the calculation of  $CO_2$  footprints and energy costs by tariff zone.

The MAVOWATT 20 is equipped with a large, color touchscreen. The various measuring functions can be selected directly with the respective icons. Intuitive user prompting is available in German, French, Italian and English.

The measuring instrument automatically detects mains parameters and electrical circuit type. The user can specify the utilized type of monitoring with automatic or manual limit value definitions by means of menu driven functions.

Acquired data are saved to CF memory cards. Optional communication is possible via RS 232, Ethernet or USB.

High performance EPRW software is included as a standard feature, which makes it possible to create energy reports or time sequences for a great variety of parameters in no time at all.

More extensive evaluations can be optionally conducted with the comprehensive analysis tools provided by DranView software.

# Specifications

#### Language Versions

German, English, French, Italian, Spanish, Swedish, Finnish, Japanese, Chinese, Korean

#### **General Specifications**

Dimensions:	300 x 203 x 64 mm (H x W x D)
Weight:	1.9 kg
Operating temperature:	0 to +50° C
Storage temperature:	-20 0 +50° C
Relative humidity:	10 to 90%, no condensation
System time:	Quartz movement, resolution: 1 s
Battery charger:	90 to 264 V AC / 47 to 63 Hz
Display:	LCD color touch-screen
Data storage:	Compact flash ≥ 4 GB
Relative humidity: System time: Battery charger: Display:	10 to 90%, no condensation Quartz movement, resolution: 1 s 90 to 264 V AC / 47 to 63 Hz LCD color touch-screen

#### **Optional Accessories**

Current clamps:	
TR-2510A:	0.1 to 10 A, conductor dia. up to 20 mm
TR-2500A:	10 to 500 A, conductor dia. up to 30 mm
TR-2520A:	3000 A, conductors up to 135 x 50 mm
TR-2019B:	1 to 300 A, conductor dia. up to 50 mm
	(adapter required)
Flexible clamps:	30 to 6000 A, various dia.
Hall sensors:	150 A or 1500m A for AC/DC
CA4300LEM:	CT cable adapter
VCP4300:	Voltage cable kit
SCC-4300:	Carrying pouch
BP-PX5:	Replacement battery pack
XBC-PX5:	External battery charger

## **Communications Interfaces**

COMM-RS232
COMM-OUA
COMM-OEA
DRAN-VIEW

Glass fiber to RS 232 Glass fiber to USB Glass fiber to Ethernet Software analysis and visualization





## **Oscilloscope Mode**

In the oscilloscope mode, all 8 channels are graphically and numerically displayed, phase locked. Direct voltage level can also be measured and monitored at all channels.



#### **Acquired and Saved Results**

Saved results can be graphically displayed as waveforms or RMS value curves. They're furnished with a precise time stamp.



# Harmonic Analysis Up To the 63<sup>rd</sup> Harmonic

The instrument acquires integer harmonics as well as subharmonics up to the 63<sup>rd</sup> harmonic, and displays them as a spectrum.



### Automatic or Manual Limit Value Settings

The configuration of the circuit connected to the instrument is detected automatically. Based on momentary measured values, limit values are set automatically for subsequent monitoring, and can be manually changed if desired.





## Phase Vector Display

This display provides a quick overview of phase relationships amongst the individual phases, as well as between the voltage and current channels. It's very well suited for testing current clamp polarity.

# **Status Display During Monitoring**

This view can be displayed any time during monitoring. In addition to momentary measured values, supplementary information is also provided such as power demand, load peaks, costs and  $CO_2$  footprint.

Measured quantities appear in color coded fields that change color like a traffic light when parameters are exceeded.

Aktueller Yerbra	Tagesverbrauch	Monatsverbrauch
16:17:51	03 Mär 10	03 Mär 10
31.81 K₩-s	14.32 KW-Hr	14.32 KW-Hr
Akt.Abrechn.perio	Daily Cost	CO2-Bilanz
1 Days into	<b>3.01 EUR</b>	<b>3.95 kg-CO2</b>
31 Day cycle	@ 0.21 EUR/kW-h	@ 0.276 kg-CO2/kW-h
RMS Spannung	RMS Strom	Wirkleistung
A 120.3	A 101.8	A 10.80K
B 120.3	B 101.8	B 10.51K
C 120.3	C 101.8	C 10.51K
Löschen Bedarf		Beenden



# **Energy Monitoring and Recording**

Energy costs are rising in all areas. Reduced energy consumption in production is becoming a more and more urgent task. The MAVOWATT 20 allows for detailed recording and analysis of energy consumption over long periods of time. Excessive peak loads at certain times of day are thus easy to detect and document.

# License-Free Energy Platform Report Writer

This software is provided with each MAVOWATT 20 and summarizes measurements in configurable, easy to read reports. Characteristic curves for voltage and current, active, reactive, and apparent power, power factor, harmonics, import, energy and many other parameters can be summarized in a user configured report. If the automatic function is used, EPRW quickly generates a report without the need for any settings.

☐ Same settin	ps for all days of th	e week		
Day	On peak stats	On-peak ends	Patial-peak stats	Partial-peak end
Monday	16:30	21:00	09:00	16:30
Tuesday	16:30	21.00	09.00	16:30
Wednesday	16:30	21:00	09:00	16.30
Thursday	16:30	21:00	09:00	16:30
Friday	16:30	21:00	09:00	16:30
Saturday	16:30	21:00	09:00	16:30
Sunday	16:30	21.00	09:00	16:30
	pan outside the g	iven ranges are o	onsidered Off-peak.	
Unit	1	On peak	Partial geak Off	peak
⊛ kW	Demand, cost	/kW 0.00	0.00 0.00	1
C KVAR	Energy.cost/	kWh 0.12	0.10 0.01	
C kVA	1.000000000			
		-		-
Billing day of m	onth: 1	Tax rat	e (%): 0	
Currency:	5	Carbon	footprint: 0.524	counds/kW
	1.		and the second	
Energy Audit s	Ope	n   Savi		
mark was a	eurga,			

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# **Technical Specifications**

#### **Measurement Inputs**

4 voltage inputs, 1 to 600 V RMS, AC/DC, 0.1% rdg., 256 samples per period, 16 bit ADC 4 current inputs, 1 to 6000 A RMS, AC/DC, 0.1% rdg. + CTs, 256 samples per period, 16 bit ADC

Frequency range: 45 to 65 Hz Phase lock loop

## **Types of Monitoring**

EN 16001 energy management system

IEC 61000-4-30, class B

Long-term monitoring with min., max. and mean values Continuous data recording

# **Distortion / Power / Energy**

THD / harmonic spectrum (U, I, P),

TID sub-harmonics / sub-harmonic spectrum (U,I) up to  $63^{rd}$  per IEC / EN 61000-4-7

Crest factor, K factor, transformer derating factor, telephone interference factor Asymmetry (max. deviation of RMS value) and sequence components

W, VA, VAR, TPF, DPF, consumption, energy etc.

#### Scope of delivery

Basic instrument with rubber holster and calibration certificate, battery charger, voltage measurement cable with alligator clips, memory card ≥4 GB and EPRW software

#### Packages

With 4 additional current clamp sensors or flexible current sensors (depending on the package), carrying pouch

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