

MAVOWATT 20

Energy Power Platform

3-349-586-03
1/7.10



WARNING

Death, serious injury, or fire hazard could result from improper connection of this instrument. Read and understand this manual before connecting this instrument. Follow all installation and operating instructions while using this instrument.

Connection of this instrument must be performed in compliance with the National Electrical Code (ANSI/NFPA 70-2008) of USA and any additional safety requirements applicable to your installation.

Installation, operation, and maintenance of this instrument must be performed by qualified personnel only. The National Electrical Code defines a qualified person as “one who has the skills and knowledge related to the construction and operation of the electrical equipment and installations, and who has received safety training on the hazards involved.”

Qualified personnel who work on or near exposed energized electrical conductors must follow applicable safety related work practices and procedures including appropriate personal protective equipment in compliance with the Standard for Electrical Safety Requirements for Employee Workplaces (ANSI/NFPA 70E-2009) of USA and any additional workplace safety requirements applicable to your installation.

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ADVERTENCIA

Una conexión incorrecta de este instrumento puede producir la muerte, lesiones graves y riesgo de incendio. Lea y entienda este manual antes de conectar. Observe todas las instrucciones de instalación y operación durante el uso de este instrumento.

La conexión de este instrumento a un sistema eléctrico se debe realizar en conformidad con el Código Eléctrico Nacional (ANSI/NFPA 70-2008) de los E.E.U.U., además de cualquier otra norma de seguridad correspondiente a su establecimiento.

La instalación, operación y mantenimiento de este instrumento debe ser realizada por personal calificado solamente. El Código Eléctrico Nacional define a una persona calificada como "una que esté familiarizada con la construcción y operación del equipo y con los riesgos involucrados."

El personal cualificado que trabaja encendido o acerca a los conductores eléctricos energizados expuestos debe seguir prácticas y procedimientos relacionados seguridad aplicable del trabajo incluyendo el equipo protector personal apropiado en conformidad con el estándar para los requisitos de seguridad eléctricos para los lugares de trabajo del empleado (ANSI/NFPA 70E-2009) de los E.E.U.U. y cualquier requisito de seguridad adicional del lugar de trabajo aplicable a su instalación.

AVERTISSEMENT

Si l'instrument est mal connecté, la mort, des blessures graves, ou un danger d'incendie peuvent s'en suivre. Lisez attentivement ce manuel avant de connecter l'instrument. Lorsque vous utilisez l'instrument, suivez toutes les instructions d'installation et de service.

Cet instrument doit être connecté conformément au National Electrical Code (ANSI/NFPA 70-2008) des Etats-Unis et à toutes les exigences de sécurité applicables à votre installation.

Cet instrument doit être installé, utilisé et entretenu uniquement par un personnel qualifié. Selon le National Electrical Code, une personne est qualifiée si "elle connaît bien la construction et l'utilisation de l'équipement, ainsi que les dangers que cela implique".

Le personnel qualifié qui travaillent dessus ou s'approchent des conducteurs électriques activés exposés doit suivre des pratiques en matière et des procédures reliées par sûreté applicable de travail comprenant le matériel de protection personnel approprié conformément à la norme pour des conditions de sûreté électriques pour les lieux de travail des employés (ANSI/NFPA 70E-2009) des Etats-Unis et toutes les conditions de sûreté additionnelles de lieu de travail applicables à votre installation.

WARNUNG

Der falsche Anschluss dieses Gerätes kann Tod, schwere Verletzungen oder Feuer verursachen. Bevor Sie dieses Instrument anschließen, müssen Sie die Anleitung lesen und verstanden haben. Bei der Verwendung dieses Instruments müssen alle Installations- und Betriebsanweisungen beachtet werden.

Der Anschluss dieses Instruments muss in Übereinstimmung mit den nationalen Bestimmungen für Elektrizität (ANSI/NFPA 70-2008) der Vereinigten Staaten, sowie allen weiteren, in Ihrem Fall anwendbaren Sicherheitsbestimmungen, vorgenommen werden.

Installation, Betrieb und Wartung dieses Instruments dürfen nur von Fachpersonal durchgeführt werden. In den nationalen Bestimmungen für Elektrizität wird ein Fachmann als eine Person bezeichnet, welche "mit der Bauweise und dem Betrieb des Gerätes sowie den dazugehörigen Gefahren vertraut ist."

Fachpersonal, das an oder in der Nähe von unter Spannung stehenden elektrischen Leitern arbeitet, muss die anwendbaren sicherheitsbezogenen Arbeitspraktiken und Verfahren gemäß der Norm für elektrische Sicherheitsauflagen für Angestelltenarbeitsplätze (ANSI/NFPA 70E-2009) der Vereinigten Staaten und aller zusätzlichen Arbeitsplatzsicherheitsauflagen befolgen, die für die jeweilige Installation gültig sind, einschließlich geeigneter persönlicher Sicherheitsausrüstung..

Safety Summary

Definitions

WARNING statements inform the user that certain conditions or practices could result in loss of life or physical harm.

CAUTION statements identify conditions or practices that could harm the instrument, its data, other equipment, or property.

NOTE statements call attention to specific information.

Symbols

The following International Electrotechnical Commission (IEC) symbols are marked on the top and rear panel in the immediate vicinity of the referenced terminal or device:



Caution, refer to accompanying documents (this manual).



Alternating current (ac) operation of the terminal or device.



Direct current (DC) operation of the terminal or device.



Power switch

Safety Precautions

The following safety precautions must be followed whenever any type of voltage or current connection is being made to the instrument.

- Connect the green safety (earth) ground first, before making any other connections.
- When connecting to electric circuits or pulse initiating equipment, open their related breakers. DO NOT install any connection of the instrument on live power lines.
- Connections must be made to the instrument first, then connect to the circuit to be monitored.
- Wear proper personal protective equipment, including safety glasses and insulated gloves when making connections to power circuits.
- Hands, shoes and floor must be dry when making any connection to a power line.
- Make sure the unit is turned OFF before connecting probes to the rear panel.
- Before each use, inspect all cables for breaks or cracks in the insulation. Replace immediately if defective.
- If the equipment is used in a manner not specified in this user's guide, the protection provided by the equipment may be impaired.

These safety precautions are repeated where appropriate throughout this manual.

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Introduction

The MAVOWATT 20 is a portable, hand-held, eight-channel demand and energy meter/monitor. This advanced power instrument is designed with a color liquid crystal display (LCD) 1/4 VGA, using touch screen technology. It can monitor, record and display data on four voltage channels and four current channels simultaneously.

The MAVOWATT 20 is designed to allow the user to easily conduct a complete demand and energy audit of a facility, a distribution circuit, or an individual piece of equipment. In addition, it simultaneously provides basic power quality (PQ) information about the system being monitored.

The MAVOWATT 20 firmware can monitor demand and energy parameters for energy audits, efficiency studies and cost reduction programs. It can carry out long-term statistical studies to establish performance baselines, and perform field-based equipment testing and evaluation for commissioning and maintenance. The firmware integrates an intuitive instrument setup procedure to ensure the capture of all relevant data for additional post process analysis, report writing, and data archiving using other compatible GOSSEN METRAWATT software applications such as the Energy Platform Report Writer® and DranView®.

Getting Started

- **Battery Charge**
Before proceeding the unit needs to be charged for a minimum 6 hours prior to be placed in service.

Connecting to AC Power Source

Power

specifications The MAVOWATT 20 AC adapter can be connected to a 90-265V ac power input source.

CAUTION Always set the power switch to the off position before connecting or disconnecting the input power cable.

Operation of the MAVOWATT 20 from an ac voltage source other than the rated voltage input stated on the unit nameplate can cause damage to the unit.

PRECAUCION Siempre fije el interruptor de encendido en la posición apagada antes de conectar o desconectar el cable de energía de entrada.

La operación del MAVOWATT 20 desde una fuente de voltaje de ca que no sea la entrada de voltaje nominal indicada en la placa de identificación de la unidad puede causar daños a la unidad.

MISE EN GARDE

Mettez toujours l'interrupteur dans la position ouverte avant de connecter ou de déconnecter le câble d'alimentation primaire.

Mettez toujours l'interrupteur dans la position ouverte avant de connecter ou de déconnecter le câble d'alimentation primaire.

VORSICHT

Vor dem Einstecken bzw. Ausstecken des Eingangsnetzka­bels den Netzschalter immer in die Aus-Stellung bringen.

Der Betrieb des MAVOWATT 20 von einer Wechselspannungsquelle, die nicht dem auf der Namensplatte der Einheit aufgeführten Nennspannungseingang entspricht, kann zur Beschädigung der Einheit führen.

AC power Source

MAVOWATT 20 can be operated from a 50/60 Hz, 120/230V AC power source or internal battery when fully charged at 2 hours.

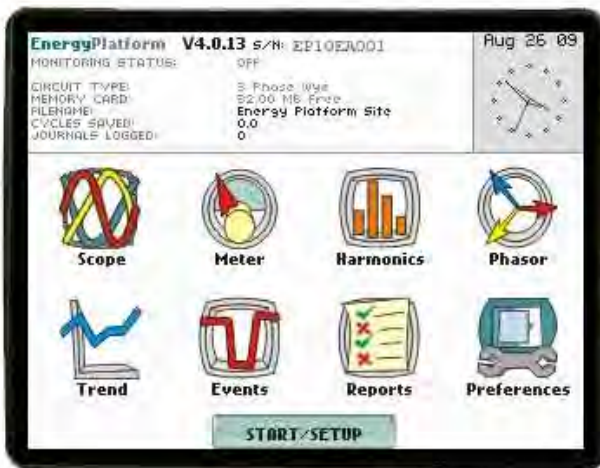
- Voltage range, 120/230V ac.
- Frequency, 50/60Hz.
- Power Consumption, 20W.

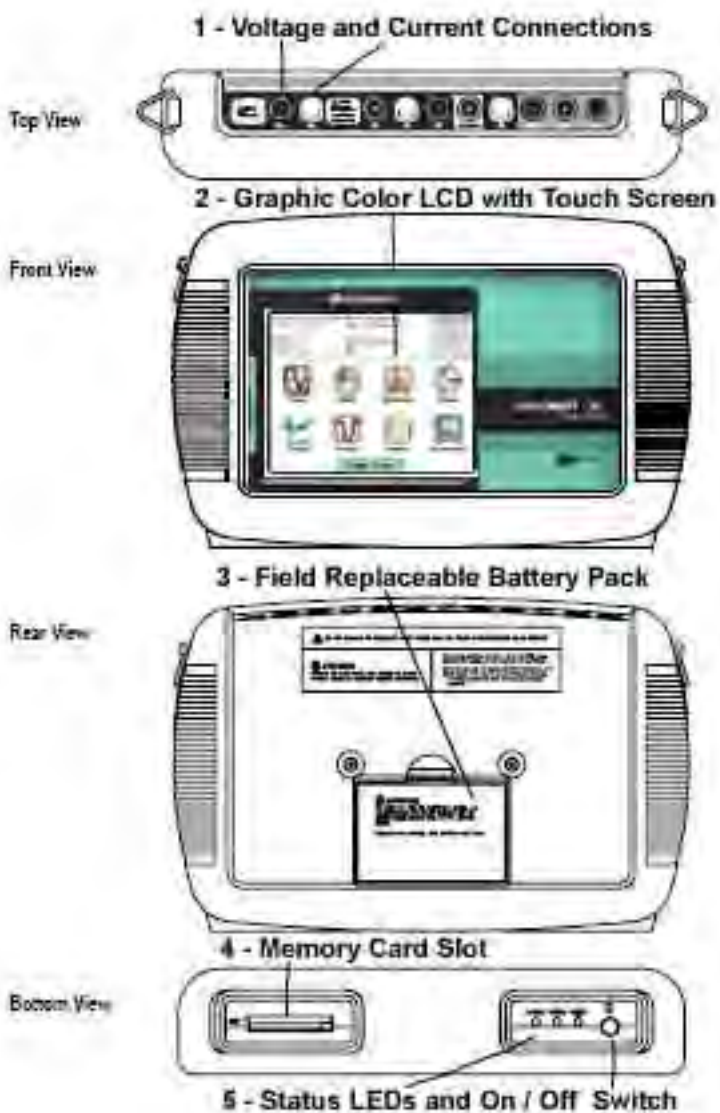
STEP 1 Connect ac adapter/battery charger plug into right side of MAVOWATT 20.

STEP 2 Plug the ac adapter into an ac power source.

STEP 3 Press the MAVOWATT 20 On/Off power button to turn the unit on.

Result: The Home screen will be displayed.





1. Voltage and Current Connections – there are four voltage and four current channels, which can be wired to measure a variety of circuit configurations. Use only GOSSEN METRAWATT voltage leads and current probes for proper operation. Do not exceed marked ratings.
2. Graphic Color LCD with Touch Screen – the color LCD has an integral touch screen that is used to select functions for setups, real time meters, and viewing stored data. Either a clean finger or a PDA-type stylus can be used and the screen should be calibrated with whichever you are going to use by selecting Preferences; Display Preferences, then Calibrate Touch screen when first turned on. Clean only with soft cloth.
3. Field Replaceable Battery Pack – the internal UPS feature requires that the internal batteries be properly charged and maintained. If the battery pack is in need of replacement, de-energize the connections and power to the unit before opening the battery door and replacing the pack only with the GOSSEN METRAWATT battery pack PN# BP-PX5 (Z818G). A spare battery pack may be useful to have.
4. Memory Card slots for data and firmware updates – the Compact Flash memory cards supplied by GOSSEN METRAWATT are used for data storage, as well as to upload new firmware versions when available. Use only memory cards supplied by GOSSEN METRAWATT, as the speed requirements of the instrument can not be satisfied by many off-the-shelf memory cards. Do not remove the memory card while monitoring. Only one slot is active at a time.
5. There are three status LEDs and the ON/OFF switch (push for on, push for off) are located on the bottom of the instrument. AC power connection for charging the battery and powering the unit with AC Adapter 117029-G1 is located on the right side of the instrument. From left to right, the LEDs are:
 - Battery Charge Indicator: LED will light steadily while battery is fast charging and blink when fully charged.
 - Status Indicator: LED will light steadily when abnormal condition is detected. The unit is operating normally when light is off.

- Power Indicator: LED will blink in a heartbeat fashion (once per second) when the unit is operating normally.

MAKING CONNECTIONS

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Connecting Voltage Measurement Cables

Measurement cable set

Description: Voltage measurement cables are provided as standard accessories and are stored in a cable pouch as part of the measurement cable set, P/N 116042-G6. Each cable set consists of a cable and alligator clip.

Voltage Rating: Direct connection of all voltage measurement cables are rated at 600 Vrms max. For measuring voltages greater than 600 Vrms, potential transformers (PTs) must be used.

Optional fused voltage adapter

There are two optional fuse accessory kits available for use with the measurement cables for MAVOWATT 20. One kit (P/N FVA-1) contains one fused voltage adapter and one measurement connecting Red cable 50 cm in length. The other kit (P/N FVA-4) contains four voltage adapters and four measurement connecting cables 50 cm in length (one Red, one Yellow, one Blue, and one Grey).

- **WARNING:** To avoid the risk of electric shock or burns, always connect the safety (or earth) ground before making any other connections.
- **WARNING:** To reduce the risk of fire, electrical shock, or physical injury it is strongly recommended to fuse the voltage measurement inputs. Fuses must be located as close to the load as possible to maximize protection.
- **WARNING:** For continued protection against risk of fire or shock hazard replace only with same type and rating of recommended fuse. Use only fast blow type fuse which is rated 600V. Recommended fuse type is Littelfuse, part number KLKD0.30 rated 600V AC/DC, 0.3A fast blow.
- **WARNING:** Do not replace fuse again if failure is repeated. Repeated failure indicates a defective condition that will not clear with replacement of the fuse. Refer condition to a qualified technician.

MAVOWATT 20 can monitor the following power configurations:

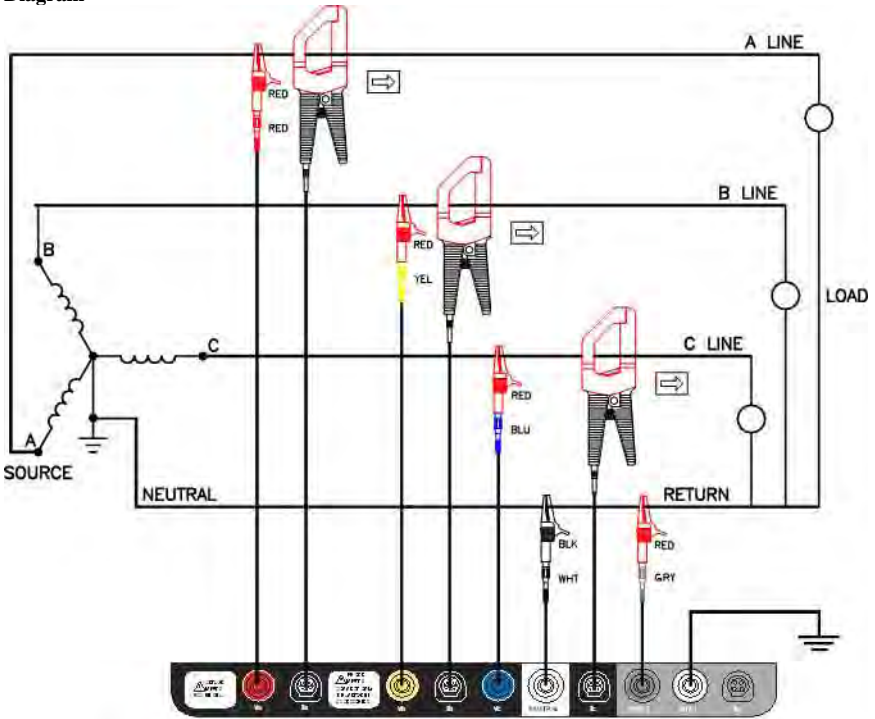
- Single phase
- Split phase
- 3 Phase Wye
- 3 Phase 2-Wattmeter Delta
- 2 ½ Element without Vb
- 2 ½ Element without Vc

3 Phase Wye, 3 Phase Delta, and Split Phase are described in this Quick Reference version of the User's Guide. For other configurations, please consult the complete Users' Guide.

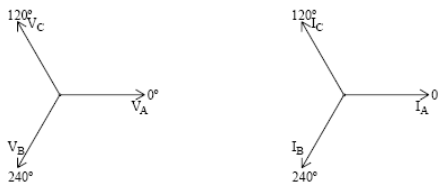
3 Phase, Four Wire Wye

Channels A, B, and C are connected to voltage and current probes. The neutral is connected to common and is the reference for the three channels. The figure also shows voltage connection using channel D as a differential input for measuring neutral to ground voltage.

Connection Diagram



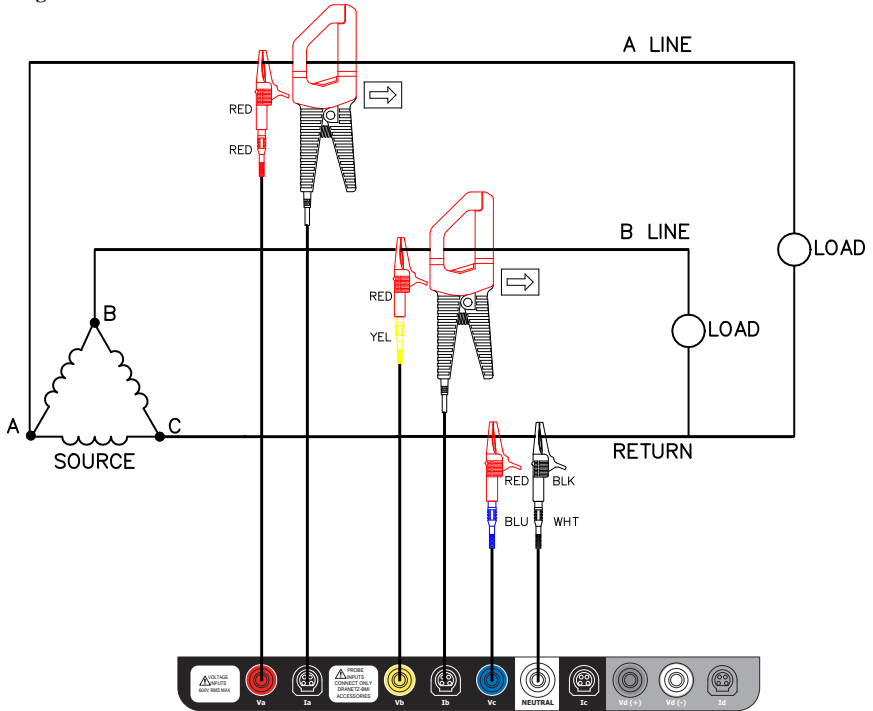
Phasor diagrams



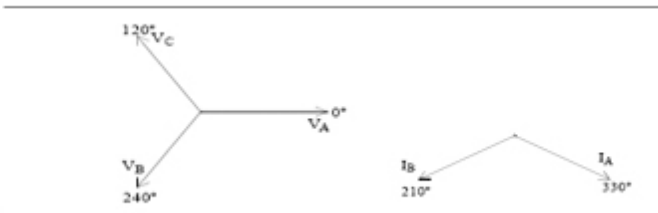
3 Phase (2-Watt Meter) Delta

The figure below shows the 3 Phase 2-Watt delta connection using phase channels A-B-C. Current probes are connected to channels A and B.

Connection Diagram



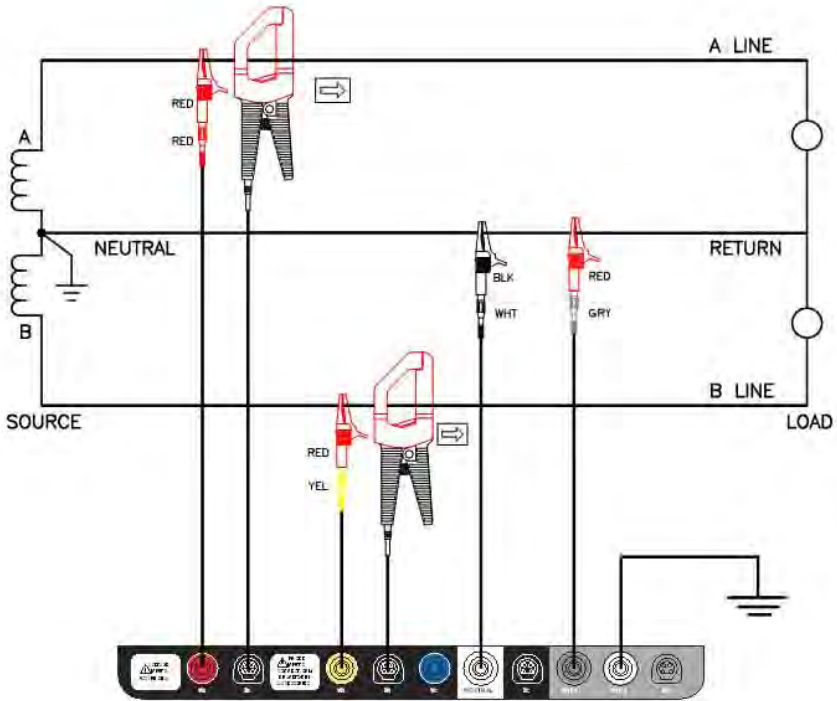
Phasor diagrams



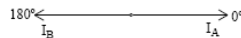
Split Phase

When making split phase measurements, use both channels A and B for voltage and current connections. The neutral is chosen as the reference for measurement purposes. The figure also shows voltage connection using channel D as a differential input for measuring neutral to ground voltage.

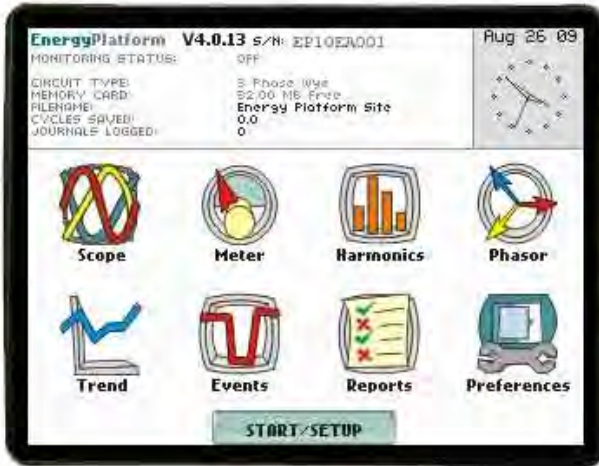
Connection Diagram



Phasor diagrams



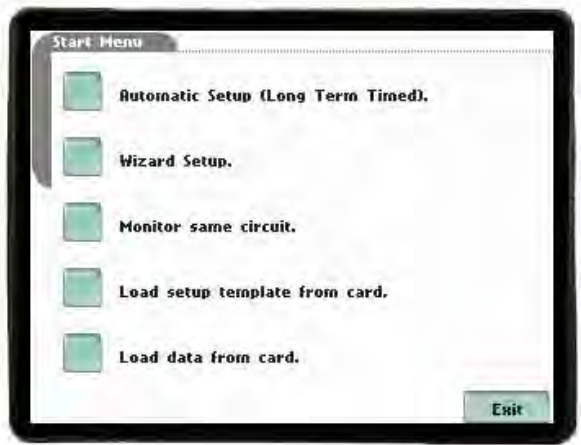
USER INTERFACE



The instrument powers up with the Home Page screen, shown above. The top portion of the screen is for status information, including: monitoring status (on, off, or armed); what type of circuit is being monitored; the memory card status (not inserted or percentage full); the data file name; the number of waveform cycles saved (indication of event activity); number of journal records saved (periodic timed storage of parameters); and, the real time clock display.

The first row of icons are referred to as Real-Time-Meters, showing the instantaneous values of the parameters. The second row of icons are for display of stored data, either through trend plots, event detection and rms plots, and reports of either demand or energy and their state (normal, out of limits). Also in this second row is the icon for setting up instrument parameters, such as time/date, memory, language, LCD, and touch screen.

In the bottom of the screen is a button for Start menu, which allows for starting to monitor from either the existing setup, recalling a stored setup from the memory card, or going through the setup process again, either in automatic setup mode, or the step-by-step wizard.



OTHER INSTRUMENT SETUP

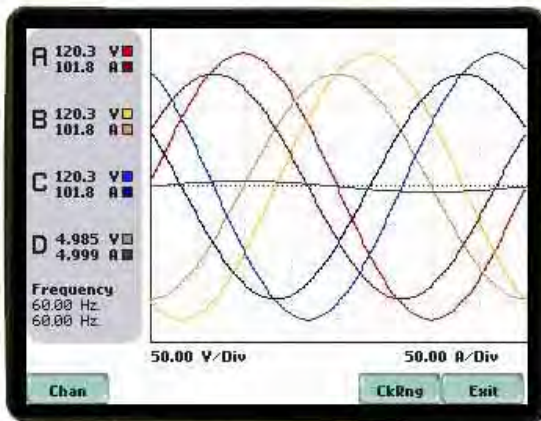
Functions, such as the time/date, which language, communication port setups, and LCD settings can be changed from the Instrument Settings menu, as well as formatting a memory card. This screen is activated from the **PREFERENCES** icon on the Home page.



REAL TIME METER MODES

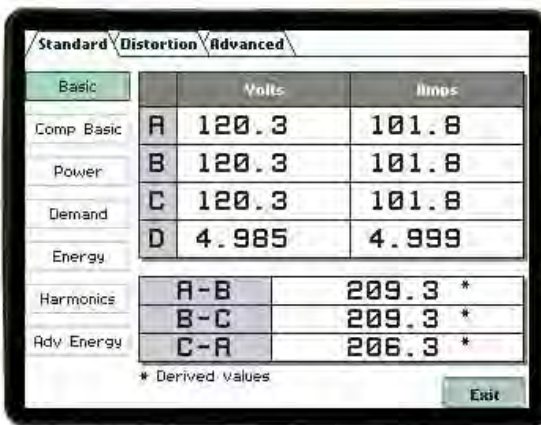
Scope mode

Scope mode functions as an oscilloscope, displaying real-time waveforms of voltage and current for up to eight channels simultaneously, with one second update rate. The colors of waveform display are user programmable. Scope mode also provides a textual display of rms values, division for axis values, and frequency.



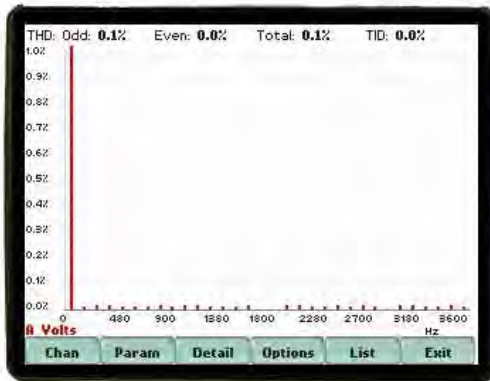
Meter mode

Meter mode functions as a true rms voltmeter and a true rms clamp-on ammeter. Voltage and current measurements, along with other calculated and advanced power parameters, are displayed on the Meter mode screens in both textual and graphical format.



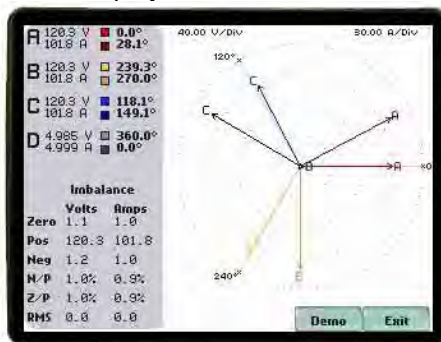
Harmonics

Harmonics display the amplitude and phase of each harmonic to the 63rd harmonic in both graphical and textual format. User can select which parameter to show the harmonics for (V,I,W), which channel (A,B,C,D), zoom in a the 5Hz components, set options such as showing harmonics and/or interharmonics and displaying in Hz or harmonic number, scaling to the fundamental or absolute value, and a list of the harmonic magnitudes and phase angles in tabular fashion.



Phasor diagram

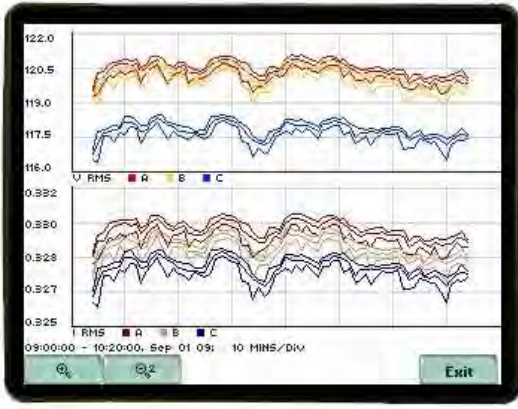
The phasor screen displays a graph that indicates phase relations between voltage and current based upon the angles at the fundamental frequency, as determined by Fourier analysis. Phasor diagram displays voltage and current phasors for all channels. Functioning as a phase angle meter, the unit can display system imbalance conditions and provides such information in textual form also. The phase angle display can also verify if monitoring connections have been made correctly. Animated phasor demo rotations demonstrating resistive, inductive and capacitive loads can be displayed.



STORED DATA FUNCTIONS and DISPLAYS

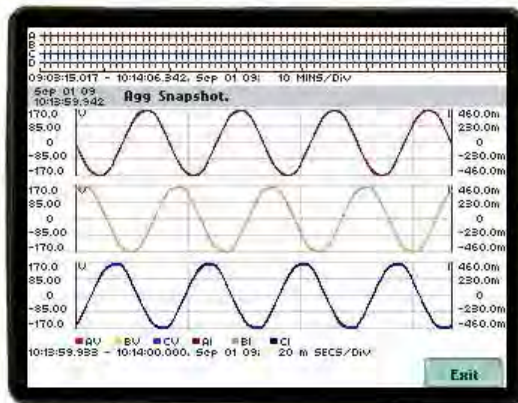
Trend

Users can generate plots for all journalled data combined with min/max recordings of that parameter. Most journal parameters have multiple channels to plot.



Events

The MAVOWATT 20 can record three types of events such as Sag, Swell, or Aggregate Snapshot. A Sag or Swell event is detected when the RMS threshold limits are exceeded by +/- 10% of the nominal input. For the Aggregate Snapshot is a timed snapshot for which a trend plot can be viewed over the user selected time interval. Also, for each type of event the min and max values and time-stamp are displayed for analysis.



Aggregate snapshot plot of rms voltage

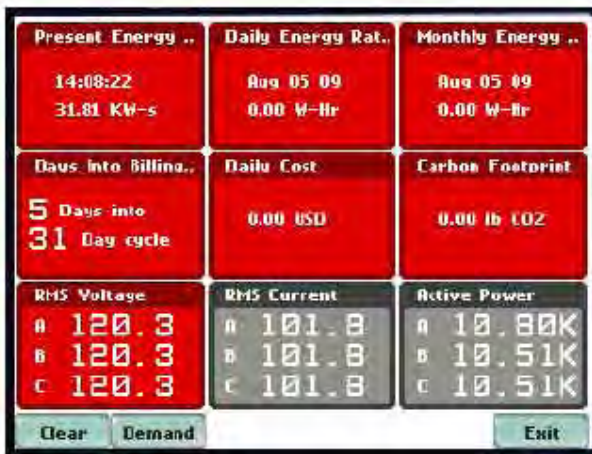
REPORTS

There are two types of reports – Energy reporting and Demand reporting panels, which the user can display the present state of several Energy and Demand parameters.

Real time data, event count, or user-specified calculated data is available in the matrix display of the annunciator panel. The report displays meter data or event count in a 3x3 matrix. The annunciator panel is color coded to indicate whether monitoring is disabled or enabled for a particular parameter. If monitoring is on, the panel shows if the parameter is within limits or moderately or severely out of limits. The parameters in the matrix are linked to the journal plot screen. If the parameter is outside of the normal, it will either turn yellow limits (low or high) or flashing red (very high or very low) until the user clears the annunciator to reset them all to green. Pressing the parameter button itself will show time plots (if applicable) and other detailed information about the parameter. If the parameter is grey this indicates that No Thresholds have been set.

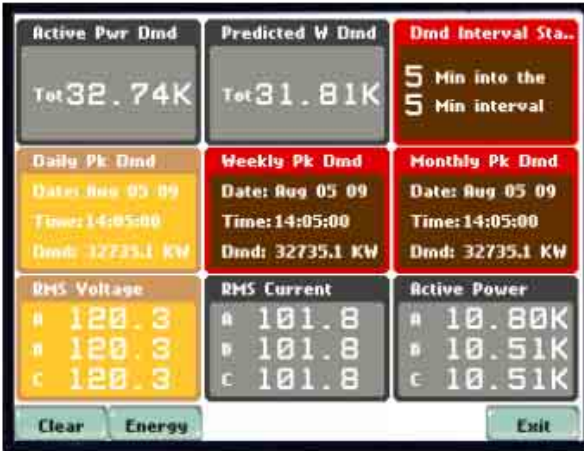
ENERGY

The Energy report displays parameters that help users track electrical consumption, manage utility costs, improve energy efficiency, and determine carbon footprint.



DEMAND

The Demand report displays basic power parameters such as volts, amps, watts, event counters, and THD.



SETUPS

Setup is a configuration of parameter thresholds that control the data recorded by MAVOWATT 20. Users may perform instrument setup in three ways: via Automatic Setup which utilizes auto-configured settings and allows users to proceed directly with data monitoring; via Wizard Setup which follows a step-by-step sequence where users go through a series of circuit setup screens; or via Advanced Options setup which allows users to modify trigger parameters and intervals or tweak threshold settings.

MEASUREMENT CONNECTIONS

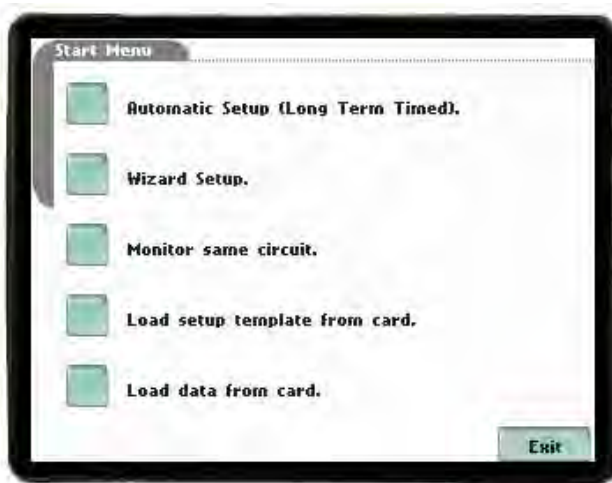
MAVOWATT 20 can monitor the following power configurations:

- Single phase
- Split phase
- 3 Phase Wye
- 3 Phase 2-Wattmeter Delta
- 2 ½ Element without Vb
- 2 ½ Element without Vc

While monitoring any of the above configurations, the MAVOWATT 20 can also be connected to monitor neutral to ground voltage and neutral or ground current.

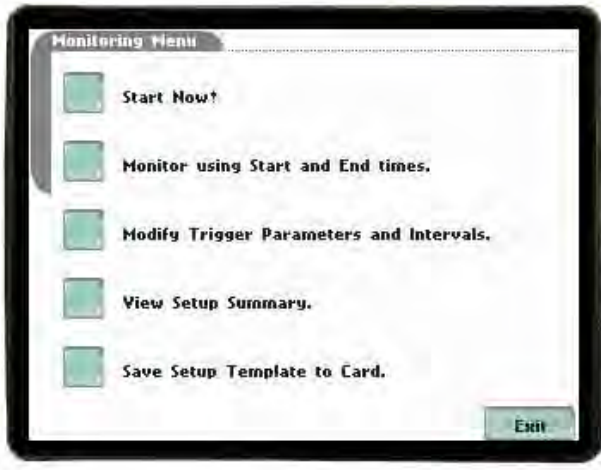
AUTOMATIC SETUP

Automatic Setup is a one-stop process using pre-defined values to set the unit automatically. Users have the option to view the summary list of parameter settings, change probe types if current will be monitored, and/or proceed directly with data monitoring.



MONITORING MENU

Once the setup (either stored, automatic or wizard) has been completed, the user can start monitoring instantly or monitor for a fixed period of time.



WIZARD SETUP

Wizard Setup guides the user through the circuit setup step-by-step, via a series of screens prompting for information about the circuit to be monitored. The unit automatically turns on the correct channels, sets the parameter thresholds and waveform capture settings depending on the detected circuit type, nominal voltage and current values, and monitoring mode specified by the user. The screens are shown in the sequence that they appear when in the Wizard Setup.

INPUT CONFIGURATION

Current probe types (if used), scale factors (when using additional PTs and/or CTs), circuit configuration (single phase, wye, delta, etc), and the nominal voltage, current and frequency tracking range are set up first before selecting the monitoring mode.

Current Probe Selection

A	Other, Scale: 1.000	Change
B	Other, Scale: 1.000	Change
C	Other, Scale: 1.000	Change
D	Other, Scale: 1.000	Change

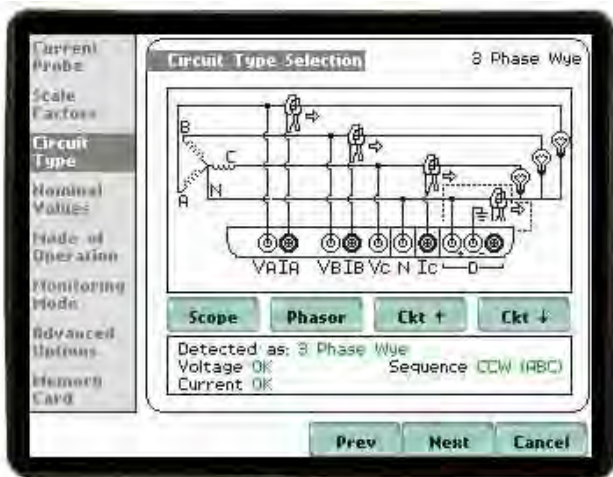
Enable Currents Set Identical

Next Cancel

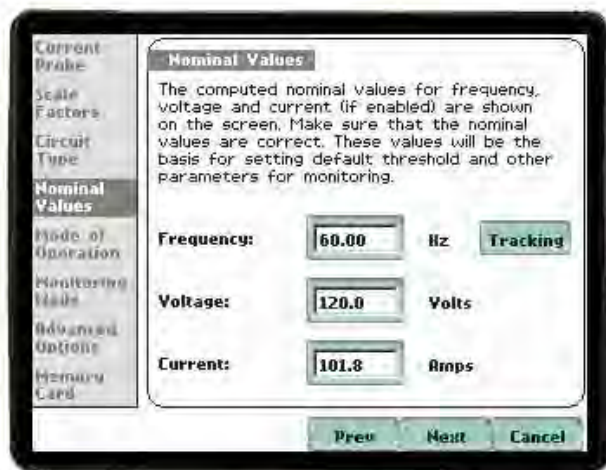
Scale Factor Setup

	Volts	Amps
A	1.000	1.000
B	1.000	1.000
C	1.000	1.000
D	1.000	1.000

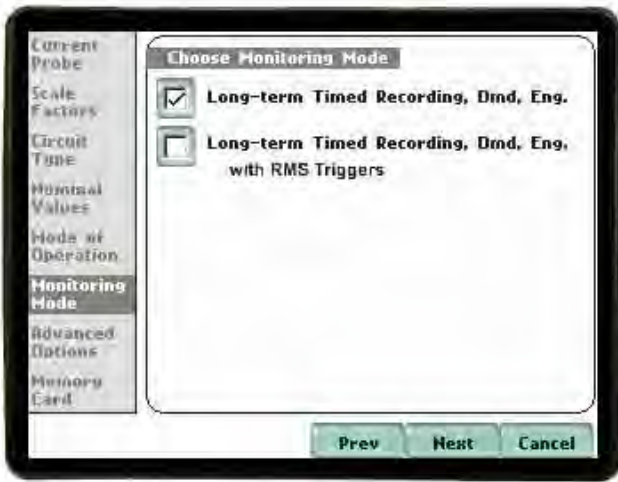
Prev Next Cancel



Includes automatic detection and comparison of wiring versus selected configuration



MONITORING MODES



Monitoring modes

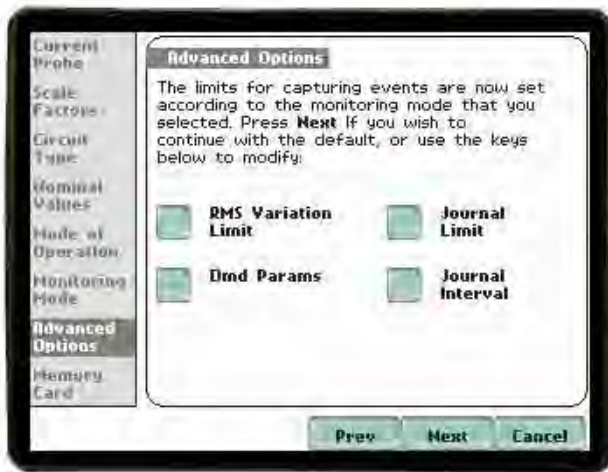
MAVOWATT 20 allows users to monitor events in the following setup categories: Long-term Timed Recording, and Continuous Data Logging. Selecting any setup category automatically sets trigger and capture conditions. Advanced users are free to mix and match settings (see Chapter 6 Advanced Setup Options).

Long-term Timed Recording, Demand, Energy: Performing a statistically valid power quality energy survey requires the capture of a set of basic data over an extended period of time. MAVOWATT 20 is designed to facilitate long-term monitoring by collecting min/max/avg data at each predetermined interval in order to perform post-process harmonic and other events analysis. MAVOWATT 20 is also designed to be left unattended in the field, recording statistically representative data for long-term analysis. Using the GOSSEN METRAWATT lockable portable case option or other available enclosures, power quality studies can be carried out in harsh weather environments.

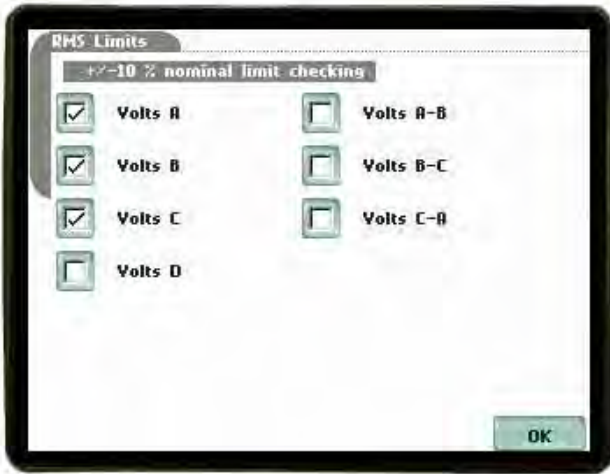
Long-term Timed Recording, Demand, Energy with RMS Triggers: Same as Long-Term Timed Recording except that snapshots and RMS event triggers are active.

EVENT DETECTION and JOURNAL SETTINGS

The RMS Variation Limit allows Sag / Swell event detection of + / - 10% variations of the nominal input and is channel selectable. While, the Demand Parameters options allows the user to set Billing particulars such as cycle, start, and rate, as well as carbon footprint constant and demand unit functions. Also, the journal limits (very high, high, low, very low) and journal interval rate can be changed by the user and saved as a template for future use.



The wizard uses interactive graphical images to show the user what the present values are and the effect of the proposed changes, as illustrated below.



	A	B	C	D	A-B	B-C	C-A
RMS Voltage							
RMS Current	Value: 120.3		Very High		144.0		
Frequency			High		132.0		
	Enable: <input checked="" type="checkbox"/>		Low		108.0		
	Group ABC <input type="checkbox"/>		Very Low		96.00		
			Dead Band				
							Exit

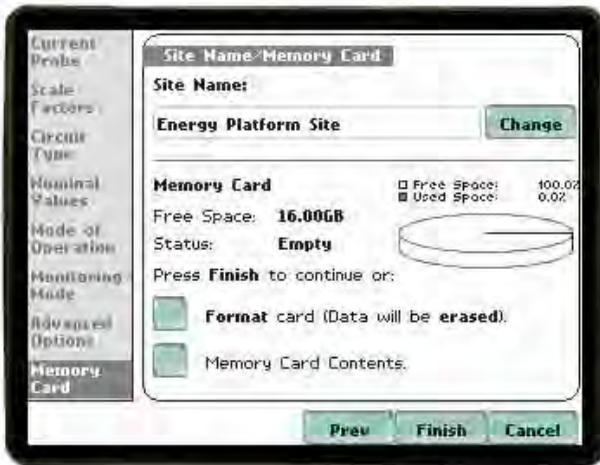
Journal Interval

- Power Values (RMS, Watts, VA...)
- Demand and Energy
- Harmonics

Finish Cancel

SITE NAME and MEMORY CARD SETUP

The last step in the setup is to select the name for the data file, as well as perform any housekeeping functions on the memory card, such as format a new card or delete old data by reformatting. When multiple monitoring sessions are performed using the same file name, the instrument automatically increments and appends a number to the end of the file name.



Examples of Energy / Demand setup using the Wizard

Long-term Timed Recording, Dmd, Eng.

Current Probe

Select the current probes you are going to use from the list. If you are using Flex probes make sure the probe and list match exactly. Full scale current should not exceed probe rating and nominal current should not be less than 10% of full scale.

Scale Factors

Set Scale factors if working with the secondary of PTs or CTs. If your Probe is in the list and selected, Amps Scale Factor should be 1 if not connected to a secondary of another CT.

Circuit Type

Select the circuit type. If you see a mismatch while connected you may not be connected properly or your current probes are reading <10% of full scale or could be V or I imbalance. You can choose to override and monitor anyway although not recommended if connection is wrong.

Nominal Values

If connected the unit will show values it is reading. If you are not connected, then you can set your values by pressing the blue bordered box.

Mode of Operation

Select *Continue*

Monitoring Mode

Select *Long-term Timed Recording, Dmd, Eng.*

Advanced Options

Four Sub-categories

- 1) RMS Variation – Leave defaults as long as Nominal Values were correct.
- 2) Journal Limit – Select *Disable*, then disable All
Note that this will disable alarming functions on the Demand and Energy Report status screens. Activate only those that you specifically need.
- 3) Dmd Params – Leave defaults
- 4) Journal Interval – Leave defaults.

Memory Card

Name your survey. The Site Name will be your data file name. Format your memory card as long as other data files are saved on your PC.

Finish then Start Now.

Long-term Timed Recording, Dmd, Eng. with RMS triggers

Same as Long-Term Timed Recording except that snapshots and RMS event triggers are active.

Monitoring Mode

Select *Long-term Timed Recording, Dmd, Eng. with RMS Triggers*

Advanced Options

Select *Journal Limits*, then *Disable All*.

Note that this will disable alarming functions on the Demand and Energy Report status screens. Activate only those that you specifically need.

General Specifications

Dimensions

Size: Width x Height x Depth:
(30 cm x 6,4 cm x 20,3 cm)

Weight: 1,9 kg

Environmental

Operating: 0 to 50 °C

Storage: -20 to 55 °C

Humidity: 95% non-condensing

Altitude:

2000 m maximum

Installation categories

Mains supply:

Installation Category II, Pollution Degree 2

Measurement inputs:

Installation Category III, Pollution Degree 2

Statements and Notices

Statement of warranty

All products of GOSSEN METRAWATT are warranted to the original purchaser against defective material and workmanship for a period of one year from the date of delivery. GMC-I Messtechnik will repair or replace, at its option, all defective equipment that is returned, freight prepaid, during the warranty period. There will be no charge for repair provided there is no evidence that the equipment has been mishandled or abused. This warranty shall not apply to any defects resulting from improper or inadequate maintenance, buyer-supplied hardware/software interfacing, unauthorized modification or misuse of the equipment, operation outside of environmental specifications, or improper site preparation or maintenance.

Statement of reliability

The information in this manual has been reviewed and is believed to be entirely reliable, however, no responsibility is assumed for any inaccuracies. All material is for informational purposes only and is subject to change without prior notice.

Notice regarding FCC compliance

This device has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

Notice regarding proprietary rights

This publication contains information proprietary to GOSSEN METRAWATT. By accepting and using this manual, you agree that the information contained herein will be used solely for the purpose of operating equipment of GOSSEN METRAWATT.

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Please contact our representatives or subsidiaries for service in other countries.

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