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(ZH)

DMG600 – DMG610

多功能电表

技术手册

(GB)

CE

DMG600 – DMG610

Digital multimeter

INSTRUCTIONS MANUAL

⚠ **警告！**
● 安装或使用前，请仔细阅读本手册。
● 本设备只能由合格人员根据现行标准进行安装，以避免造成损坏或安全危害。
● 对设备进行任何维护操作前，请移除测量输入端和电源输入端的所有电压，并短路 CT 输入终端。
● 此处说明的产品可能会有变更，恕不提前通知。
● 我们竭力确保本文档中技术数据和说明的准确性，但对于错误、遗漏或由此产生的意外事件概不负责。
● 建筑电气系统中必须装有断路器。断路器必须安装在靠近设备且方便操作员触及的地方。必须将断路器标记为设备的断开装置：
IEC /EN 61010-1 § 6.11.2.
● 请使用柔软的干布清洁设备；切勿使用研磨剂、洗涤液或溶剂。

⚠ **WARNING!**
● Carefully read the manual before the installation or use.
● This equipment is to be installed by qualified personnel, complying to current standards, to avoid damages or safety hazards.
● Before any maintenance operation on the device, remove all the voltages from measuring and supply inputs and short-circuit the CT input terminals.
● Products illustrated herein are subject to alteration and changes without prior notice.
● Technical data and descriptions in the documentation are accurate, to the best of our knowledge, but no liabilities for errors, omissions or contingencies arising there from are accepted.
● A circuit breaker must be included in the electrical installation of the building. It must be installed close by the equipment and within easy reach of the operator.
It must be marked as the disconnecting device of the equipment:
IEC /EN 61010-1 § 6.11.2.
● Clean the instrument with a soft dry cloth; do not use abrasives, liquid detergents or solvents.

简介

DMG600 和 DMG610 多功能电表操作简易、功能先进。柜面安装（96x96mm 外壳），前面板设计新颖，免工具安装，背部可扩展安装一个 EXP… 系列模块。前面板配备红外线光学接口，可通过 USB 或 WiFi 加密狗进行编程。背光 LCD 显示提供用户友好的界面。DMG610 型号亦提供带 Modbus 协议的独立 RS-485 接口供远程监控使用。

Introduction

The DMG600 and DMG610 multimeters have been designed to combine the maximum possible easiness of operation together with a wide choice of advanced functions. The flush-mount 96x96mm housing joins the modern design of the front panel with the tool-less mounting of the device body and the expansion capability of the rear panel, where it is possible to mount plug-in one module of EXP…series. The front panel is equipped with an infrared optical interface that allows programming through USB or WiFi dongles.Theback- lighted LCD display offers a user-friendly interface. Model DMG610 is also provided with a isolated RS-485 interface with Modbus protocol to consent remote supervision.

Description

- Digital three-phase multimeter.
- Flush-mount, standard 96x96mm housing.
- Backlit LCD screen.
- Versions:
  - DMG600 – base version, expandable.
  - DMG610 – expandable, with built-in RS485 interface.
- 4 navigation keys for function and settings.
- Expansion bus with 1 slot for EXP series expansion modules:
  - RS232, RS485, Ethernet, USB communication interfaces.
  - Digital I/O (static or relay).
- High accuracy TRMS measurements.
- Wide selection of electrical measures, including voltage and current THD.
- Wide-range power supply (100-440VAC).
- Front optical programming interface: galvanically isolated, high speed, waterproof, USB and WiFi dongle compatible.
- Programming from front panel, from PC or from tablet/smartphone.
- 2-level password protection for settings.
- Backup copy of original commissioning settings.
- Tool-less panel mount.

前面板键盘

MENU 键 – 用于进入或退出可视化和设置菜单。

▲ 和 ▼ 键 – 用于滚动显示页面，选择项目及修改设置(增-减)。

↻键 – 用于二级页面翻转、确认选项以及在可视模式间转换。

Front keyboard

MENU key – Used to enter or exit from visualization and setting menus.

▲ and ▼ keys – Used to scroll display pages, to select among possible choices and to modify settings (increment-decrement).

↻ key – Used to rotate through sub-pages, to confirm a choice, to switch between visualization modes.

显示屏说明

测量页面说明 | 测量主显示屏 | 测量主显示屏 | 选中相指示 | 条形图 | 二级页面指示 | 条形图满量程指示 | 报警图标 | 电能数字字母显示屏 | 通讯指示

Display indications

Measure page indication | Main display for measures | Main display for measures | Indication of selected phase(s) | Bar graph | Indication of sub-page | Indication of bar graph full scale | Alarm icon | Energy alpha-numeric display | Communication active
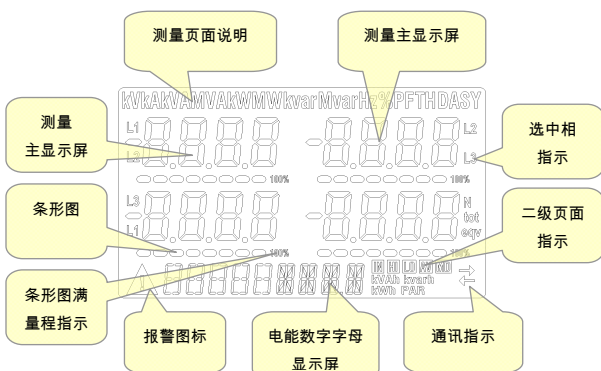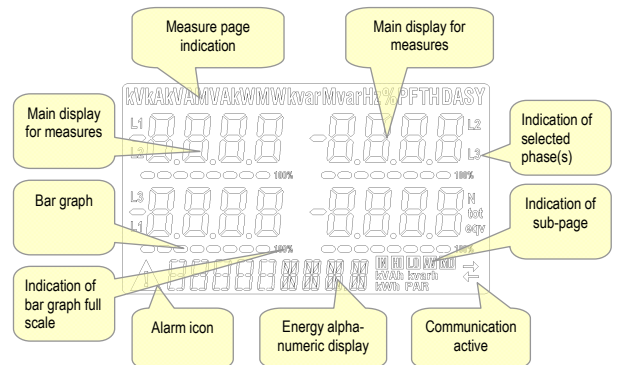
查看测量值

- 可利用 ▲ 和 ▼ 键逐一滚动已查看测量值的页面。所查看页面的测量单位显示在显示屏顶部。
- 根据设备的编程和接线，某些读数可能不会显示（例如如果为不带中性线三相系统编程和接线，那么 L-N 电压页面不会显示）。
- 在各页面上，↻ 键可实现在几个二级页面间翻转（以便显示选定读数的最高/最低峰值或实现其他功能）。
- 所查看的二级页面中，右下角显示的图标解释如下：
  - **IN = 瞬时值**– 读数的实际瞬时值，默认在每次改变页面时显示。
  - **HI = 最大值**– 相关读数瞬时值的最高峰值。HIGH 值即使在辅助电源断开后也仍保存在存储器中。可使用专用命令清除该值（参见命令菜单）。
  - **LO = 最小值**– 读数的最低值，自 DMG 通电时储存。重置该值需使用与 HI 值重置相同的命令。
  - **AV = 平均值**– 读数的时间积分值。这样可显示缓慢变化的测量值。参阅设置一章中的积分菜单。
  - **MD = 最大需量**- 积分值的最大峰值。储存在永久性存储器内，可通过专用命令重置。

- 用户可以规定在超过一段时间没有任何按键输入后显示屏必须返回到哪一个页面和二级页面。
- 如有需要，可对多功能电表进行设置，让显示屏一直停留在离开前的页面。
- 要设置这些功能请参阅菜单 P02 – Utility。

Viewing of measurements

- The ▲and ▼keys allow to scroll the pages of viewed measurements one by one. The page being viewed is shown by the unit of measure in the top part of the display.
- Some of the readings may not be shown, depending on the programming and the wiring of the device (for instance, if programmed-wired for a three-phase without neutral system, L-N voltage page is not shown).
- For every page, the ↻key allows to rotate through several sub-pages (for instance to show the highest/lowest peak for the selected readings).
- The sub-page viewed is indicated on the bottom-right of the display by one of the following icons:
  - **IN** = Instantaneous value – Actual instantaneous value of the reading, shown by default every time the page is changed.
  - **HI** = Highest peak – Highest peak of the instantaneous value of the relative reading. The HIGH values are stored and kept even when auxiliary power is removed. They can be cleared using the dedicated command (see commands menu).
  - **LO = Lowest peak** – Lowest value of the reading, stored from the time the DMG is powered-on. It is resetted using the same command used for HI values.
  - **AV = Average value** – Time-integrated value of the reading. Allows showing measurements with slow variations. See integration menu in setup chapter.
  - **MD = Maximum Demand** - Maximum peak of the integrated value. Stored in non-volatile memory and it is resettable with dedicated command.

- The user can define to which page and sub-page the display must return to after a period of time has elapsed without any keystroke.
- If needed, it is possible to set the multimeter so that the display will remain always in the position in which it has been left.
- To set these functions see menu P02 – Utility.

显示页面表

Nr	页面 选择键 ▲ 和 ▼				选择键 ↻ 二级页面
1	线电压 V(L1-L2)、V(L2-L3)、V(L3-L1)、V(LL)EQV	HI	LO	AV	
2	相电压 V(L1-N)、V(L2-N)、V(L3-N)、V(L-N)EQV	HI	LO	AV	
3	相电流和中性线电流 I(L1)、I(L2)、I(L3)、I(N)	HI	LO	AV	MD
4	有功功率 P(L1)、P(L2)、P(L3)、P(TOT)	HI	LO	AV	MD
5	无功功率 Q(L1)、Q(L2)、Q(L3)、Q(TOT)	HI	LO	AV	MD
6	视在功率 S(L1)、S(L2)、S(L3)、S(TOT)	HI	LO	AV	MD
7	功率因数 PF(L1)、PF(L2)、PF(L3)、PF(EQ)	HI	LO	AV	
8	有功功率不平衡 L1-L2、L2-L3、L3-L1	HI	LO	AV	
9	频率 F、ASY(VLL)、ASY(VLN)、ASY(I)	HI	LO	AV	
10	线电压不对称 ASY(VLL)	HI	LO	AV	
11	相电压不对称 ASY(VLN)	HI	LO	AV	
12	电流不对称 ASY(I)	HI	LO	AV	
13	线电压谐波失真 THD-V(L1-L2)、THD-V(L2-L3)、THD-V(L3-L1)	HI	LO	AV	
14	VLL 谐波		H2...H15		
15	相电压谐波失真 THD-V(L1)、THD-V(L2)、THD-V(L3)	HI	LO	AV	
16	VLN 谐波		H2...H15		
17	电流谐波失真 THD-I(L1)、TH -I(L2)、THD-I(L3)	HI	LO	AV	
18	电流谐波		H2...H15		
19	电能表 (L1) kWh+(L1)		TOT		PAR
20	kWh-(L1)		TOT		PAR
21	电能表 (L2) kWh+(L2)		TOT		PAR
22	kWh-(L2)		TOT		PAR
23	电能表 (L3) kWh+(L3)		TOT		PAR
24	kWh-(L3)		TOT		PAR
25	电能表 (L1) kvarh+(L1)		TOT		PAR
26	kvarh-(L1)		TOT		PAR
27	电能表 (L2) kvarh+(L2)		TOT		PAR
28	kvarh-(L2)		TOT		PAR
29	电能表 (L3) kvarh+(L3)		TOT		PAR
30	kvarh-(L3)		TOT		PAR
31	计时器 hhhhhh mm ss		TOT		PAR
32	I/O 状态				
33	门限 LIM1-LIM2-LIM3-LIM4				
34	报警 ALA1–ALA2–ALA3–ALA4				
35	信息-修订-序列号 MODEL、REV SW、REV HW、SER. No.,				

注：如果相关控制功能或参数未激活，那么上述页面中的一些页面（带灰色背景）可能不可用。例如，如果尚未定义报警，那么报警页面就不会显示。

Table of display pages

Nr	PAGES Selection with ▲and ▼				Selection with ↻ SUB-PAGES
1	PHASE-TO-PHASE VOLTAGES V(L1-L2), V(L2-L3), V(L3-L1), V(LL)EQV	HI	LO	V	
2	PHASE-TO-NEUTRAL VOLTAGES V(L1-N), V(L2-N), V(L3-N), V(L-N)EQV	HI	LO	AV	
3	PHASE AND NEUTRAL CURRENTS I(L1), I(L2), I(L3), I(N)	HI	LO	AV	MD
4	ACTIVE POWER P(L1), P(L2), P(L3), P(TOT)	HI	LO	AV	MD
5	REACTIVE POWER Q(L1), Q(L2), Q(L3), Q(TOT)	HI	LO	AV	MD
6	APPARENT POWER S(L1), S(L2), S(L3), S(TOT)	HI	LO	AV	MD
7	POWER FACTOR PF(L1),PF(L2),PF(L3),PF(EQ)	HI	LO	AV	
8	ACTIVE POWER UNBALANCE L1-L2, L2-L3, L3-L1	HI	LO	AV	
9	FREQUENCY F, ASY(VLL), ASY(VLN), ASY(I)	HI	LO	AV	
10	ASYMMETRY ASY(VLL)	HI	LO	AV	
11	ASYMMETRY ASY(VLN)	HI	LO	AV	
12	ASYMMETRY ASY(I)	HI	LO	AV	
13	PH-PH VOLTAGE HARM. DISTORTION THD-V(L1-L2), THD-V(L2-L3), THD-V(L3-L1)	HI	LO	AV	
14	VLL HARMONICS		H2…H15		
15	PH-N VOLTAGE HARMONIC DISTORTION THD-V(L1),THD-V(L2),THD-V(L3)	HI	LO	AV	
16	VLN HARMONICS		H2…H15		
17	CURRENT HARMONIC DISTORTION THD-I(L1), THD-I(L2) THD-I(L3)	HI	LO	AV	
18	CURRENT HARMONICS		H2…H15		
19	ENERGY METERS (L1) kWh+(L1)		TOT		PAR
20	kWh-(L1)		TOT		PAR
21	ENERGY METERS (L2) kWh+(L2)		TOT		PAR
22	kWh-(L2)		TOT		PAR
23	ENERGY METERS (L3) kWh+(L3)		TOT		PAR
24	kWh-(L3)		TOT		PAR
25	ENERGY METERS (L1) kvarh+(L1)		TOT		PAR
26	kvarh-(L1)		TOT		PAR
27	ENERGY METERS (L2) kvarh+(L2)		TOT		PAR
28	kvarh-(L2)		TOT		PAR
29	ENERGY METERS (L3) kvarh+(L3)		TOT		PAR
30	kvarh-(L3)		TOT		PAR
31	HOUR METER hhhhhh mm ss		TOT		PAR
32	I/O STATUS				
33	LIMIT THRESHOLDS LIM1-LIM2-LIM3-LIM4				
34	ALARMS ALA1–ALA2–ALA3–ALA4				
35	INFO-REVISION-SERIAL NO.. MODEL, REV SW, REV HW, SER. No.,				

Note: Some of the pages listed above (those with gray background) may not be available if the function or the parameter that control them is not enabled. For instance, if no alarms have been defined, then the Alarm page will not be shown.

线电压
Phase–Phase voltages
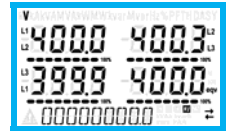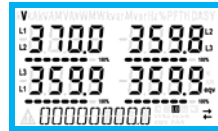
IN = 瞬时值 **IN** = Instantaneous value	**HI** = 最大值 **HI** = Highest value	**LO** = 最小值 **LO** = Lowest value	**AV** = 平均值 **AV** = Average value

▼ ▲

相电压
Phase–Neutral voltages
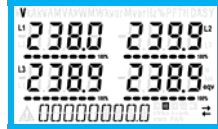
IN = 瞬时值 **IN** = Instantaneous value	**HI** = 最大值 **HI** = Highest value	**LO** = 最低值 **LO** = Lowest value	**AV** = 平均值 **AV** = Average value

▼ ▲

相电流和中性线电流
Phase and Neutral currents

IN = 瞬时值 **IN** = Instantaneous value	**HI** = 最大值 **HI** = Highest value	**LO** = 最低值 **LO** = Lowest value	**AV** = 平均值 **AV** = Average value

▼ ▲

电能表显示值
- 正常运行期间，显示屏下方显示电能表读数。
- 设备默认在显示电气测量值的同时显示输入总有功电能表读数 (kWh)。
- 设备在无功功率页面显示输入无功电能 (kvarh)，在视在功率页面显示视在电能 (kVAh)。
- 如果测量单位显示稳定，那么说明在使用输入电能表（正）。将参数 P02.09 设置为 ON 还可以显示输出电能（负）。这些电能由闪烁的测量单位表示，按下 ▼ 即可在下一页查看。

输入有功电能   *输出有功电能*

- 如果激活单相电能视图 (P02.10 = ON)，那么各功率将有三个额外的独立页面，每个页面对应一相，共同得出对应相的功率和电能。

计时器显示值
- 如果激活计时器（见菜单 P05），那么 DMG600-610 将显示计时器页面，其格式如下图所示：

时 / 分 / 秒

门限显示值 (LIMn)

Indication of energy meters
- During normal operation, the lower part of the display is used to visualize the energy meters.
- By default, together with the electrical measures, the device displays imported total active energy meter (kWh).
- In conjunction with the page of the reactive power the device displays the imported reactive energy (kvarh), while with apparent power the apparent energy (kVAh).
- If the unit of measure is shown steady, it means that the meter in question is that of imported energy (positive). By setting parameter P02.09 to ON you can also enable the display of the exported energies (negative). These energies are indicated by the flashing unit of measure, and they are displayed in the next page by pressing ▼.

Imported active Energy   *Exported active energy*

- If the visualization of energies for single phase is enabled (P02.10 = ON), then you will see for each power three additional independent pages, one for each phase, comprising the power and the energy related to the relevant phase.
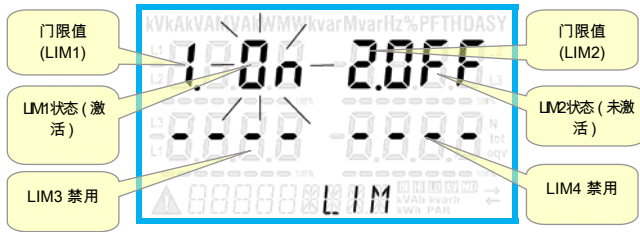
Indication of hour meter
- If the hour meter is enabled (see menu P05) the DMG600-610 displays the hour meter page with the format shown in the following picture:

Hours / Minutes / Seconds

Indication of limit thresholds (LIMn)

- 如果已激活一个或多个门限（LIMn，见菜单 P08），那么其状态如下图所示。

门限值 (LIM1) — LIM1状态（激活）— LIM3 禁用
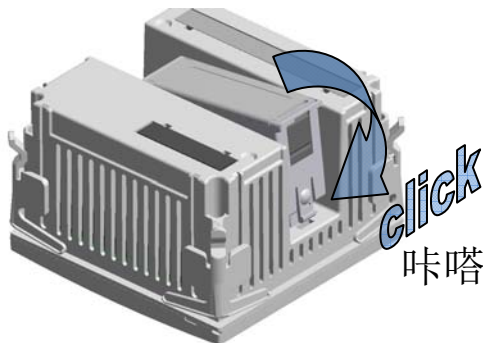门限值 (LIM2) — LIM2状态（未激活）— LIM4 禁用

谐波分析指示

- DMG600-610 可为下列测量进行谐波分析多达 15 阶次：
    - 线电压
    - 相电压
    - 电流
- 要激活谐波分析，设定 P02.12= THD+ HAR。
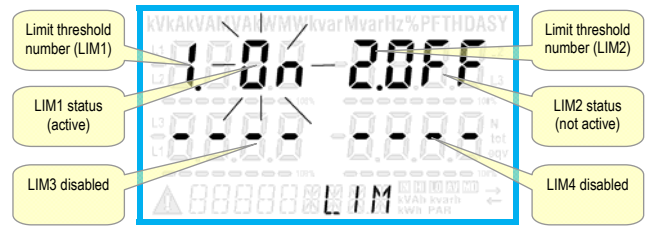- 当 P02.12= THD，只显示上述测量的 THD。

可扩展性

- 借助扩展总线，DMG600-610 可通过一个 EXP… 系列模块进行扩展。
- 支持的 EXP 模块分为以下几类：
    - 通讯模块
    - 数字 I/O 模块
- 若要插入扩展模块：
    - 断开 DMG600-610 的电源连接。
    - 拆下扩展插槽的防护盖。
    - 将模块上部的钩子插入扩展插槽顶部的固定孔。
    - 向下转动模块主体，将接头插入总线。
    - 推模块主体，直到底部的夹子卡入外壳。

- 当 DMG600-610 上电后，自动识别已安装的 EXP 模块。
- 通过专用设置菜单可使用扩展模块提供的额外功能。
- 与扩展相关的设置菜单始终可访问，即便实际并未安装扩展模块。
- 下表说明了受支持的扩展模块型号：

模块类型	代码	功能
数字 I/O	EXP 10 00	4 路输入
	EXP 10 01	4 路静态输出
	EXP 10 02	2 路输入 + 2 路静态输出
	EXP 10 03	2 路 C/O 继电器
	EXP 10 08	2 路输入 + 2 路继电器输出
通讯	EXP 10 10	USB
	EXP 10 11	RS-232
	EXP 10 12	RS-485
	EXP 10 13	以太网

- If one or more limit thresholds have been enabled (LIMn, see menu P08) then their status is indicated like shown in the following picture.

Limit threshold number (LIM1) — LIM1 status (active) — LIM3 disabled
Limit threshold number (LIM2) — LIM2 status (not active) — LIM4 disabled

Harmonic analysis indication

- The DMG600-610 features harmonic analysis up to the 15th order for the following measurements:
    - phase-to-phase voltages
    - phase-to-neutral voltages
    - currents
- To activate harmonic analysis, set P02.12 = THD+HAR.
- With P02.12 = THD, only the THD of the above measurements is displayed.

Expandability

- Thanks to expansion bus, the DMG600-610 can be expanded with one EXP… series module.
- The supported EXP modules can be grouped in the following categories:
    - communication modules
    - digital I/O modules
- To insert an expansion module:
    - remove the power supply to DMG600-610.
    - remove the protecting cover of the expansion slot.
    - insert the upper hook of the module into the fixing hole on the top of the expansion slot.
    - rotate down the module body, inserting the connector on the bus.
    - push until the bottom clip snaps into its housing.
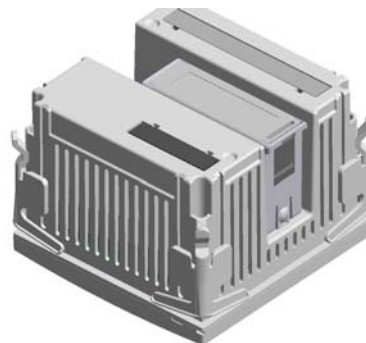
- When the DMG600-610 is powered on, it automatically recognises the EXP module that have been mounted.
- The expansion modules provide additional resources that can be used through the dedicated setup menus.
- The setup menus related to the expansions are always accessible, even if the expansion modules are not physically fitted.
- The following table indicates which models of expansion modules are supported:

MODULE TYPE	CODE	FUNCTION
DIGITAL I/O	EXP 10 00	4 INPUTS
	EXP 10 01	4 STATIC OUTPUTS
	EXP 10 02	2 IN + 2 STATIC OUT
	EXP 10 03	2 RELAY C/O
	EXP 10 08	2 IN + 2 RELAY OUT
COMMUNICATION	EXP 10 10	USB
	EXP 10 11	RS-232
	EXP 10 12	RS-485
	EXP 10 13	Ethernet

IR 编程端口

- DMG600-610 的参数可通过以下途径配置：
  前面板光学端口、使用 IR-USB（代码 CX01）编程加密狗
  或 IR-WiFi（代码 CX02）加密狗。
- 该编程端口具有以下优势：
  o 无需接触设备背面或打开配电屏即可配置和维护
    DMG600-610。
  o 它与 DMG600-610 的内部电路电气隔离，可最大程度
    保障操作员的安全。
  o 高速数据传输。
  o IP54 前面板防护。
  o 由于必须使用 CX01 或 CX02 加密狗，因此减少了未
    经授权访问设备配置的可能性。

- 只需将 CX... 加密狗的插针插入到前面板对应的插孔即可，
  如果编程加密狗上的 LINK LED 闪烁绿色，即表示设备被
  识别。

IR programming port

- The parameters of the DMG600-610 can be configured through the front optical port, using the IR-USB code CX01 programming dongle, or with the IR-WiFi code CX02 dongle.
- This programming port has the following advantages:
  o You can configure and service the DMG600-610 without access to the rear of the device or having to open the electrical panel.
  o It is galvanically isolated from the internal circuits of the DMG600-610, guaranteeing the greatest safety for the operator.
  o High speed data transfer.
  o IP54 front panel protection.
  o Limits the possibility of unauthorized access with device config, since it is necessary to have the CX01 or CX02 dongles.

- Simply hold the CX.. dongle up to the front panel, connecting the plugs to the relevant connectors, and the device will be acknowledged as shown by the LINK LED on the programming dongle flashing green.

USB 编程加密狗（代码 CX01）
USB programming dongle code CX01

WiFi 编程加密狗（代码 CX02）
WiFi programming dongle code CX02

利用 PC、平板电脑或智能手机设置参数

- **PC：** 您可使用 *Synergy* 软件将（预编程的）设置参数从 DMG600-610 传输到 PC 硬盘，反之亦可。
- **平板电脑/智能手机：** 使用专用应用程序 *Lovato Electric Sam1*（支持安卓和 iOS 操作系统）以及 CX02 加密狗可以通过简单创新的方式对参数进行编程。

Parameter setting with PC, Tablet or SmartPhone

- **PC:** You can use the *Synergy* software to transfer (previously programmed) set-up parameters from the DMG600-610 to the hard drive of the PC and vice versa.
- **Tablet/Smartphone**: Using the dedicated application *Lovato Electric Sam1*, available for Android and iOS operative systems together with the CX02 dongle, it is possible to program the parameters in a very easy and innovative way.

主菜单

要访问主菜单：

- 按下 MENU 按钮。显示屏将显示主菜单（见图）和以下选项：
  - **SET** - 访问设置菜单的设置项
  - **CMD** - 访问命令菜单
  - **PAS** - 输入密码
  - **I-O** - I/O 扩展状态
- 选定选项将闪烁。字母数字显示屏上滚动显示文字说明。
- 如果您必须输入密码，那么菜单在打开时会选中 PAS。
- 按下 ▲ ▼ 选择希望的项目，然后按下 ↻ 确认选择。
- 如果您希望返回测量值显示窗口，那么再次按下 **MENU**。

通过前面板设置参数

- 从正常测量值显示窗口中，按下 MENU 打开主菜单，然后选择 **SET** 并按下 ↻ 访问设置菜单。
- 显示屏左下角将显示第一级菜单 P.01，同时选项 **01** 闪烁。
- 使用 ▲或 ▼ 按钮选择所需的菜单（**P.01、P.02、P.03**...），选中后，字母数字显示屏将滚动显示当前选中菜单的简要说明。
- 如果您希望退出并返回到测量值显示窗口，那么再次按下 **MENU**。

设置：菜单选择

- 下表列出了可用的菜单：

代码	菜单	说明
P01	GENERAL	装置的详细数据
P02	UTILITY	语言、背光、显示
P03	PASSWORD	访问代码激活
P04	INTEGRATION	读数积分时间
P05	HOUR COUNTER	激活计时器
P07	COMMUNICATION (COMn)	通讯端口
P08	LIMIT THRESHOLDS (LIMn)	门限
P09	ALARMS (ALAn)	报警消息
P11	ENERGY PULSING (PULn)	能量脉冲计数
P13	INPUTS (INPn)	数字输入
P14	OUTPUTS (OUTn)	数字输出

- 按下 ↻ 进入所选菜单。
- 此时，您可以使用如下功能键选择二级菜单（如果有），然后选择参数的顺序号：

Main menu

To access the main menu:

- Press the MENU button. The main menu is displayed (see figure) with the following possible choices:
  - **SET** - Access to the Setup menu settings
  - **CMD** - Access to the command menu
  - **PAS** - Entering the Password
  - **I-O** - I / O expansion status
- The selected choice flashes. In the alphanumeric display scrolls a written description.
- If you must enter the password, the menu opens with the voice PAS already selected.
- Press ▲ ▼ to select the desired item and then press ↻ to confirm your choice.
- If you want to return to the measurement display, press MENU again.

Parameter setting (setup) from front panel

- From the normal measurement display, press **MENU** to call up the main menu, then select **SET** and press ↻ to access the settings menu.
- The display shows the first menu level P.01 in the display in the lower left, with selection **01** flashing.
- Select the desired menu (P.**01**, P.**02**, P.**03** ...) using the ▲ ▼ buttons. As you select, the alphanumeric display provides a brief scrolling description of the currently selected menu.
- If you want to exit and return to the measurement display, press **MENU**.
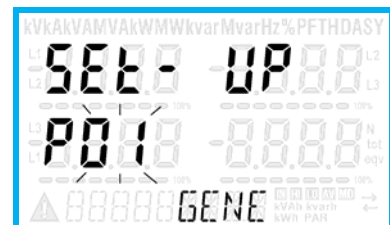
Setup: menu selection

- The following table lists the available menus:

Cod.	MENU	DESCRIPTION
P01	GENERAL	Detailed data of the installation
P02	UTILITY	Language, backlight, display
P03	PASSWORD	Access codes enabling
P04	INTEGRATION	Readings integration time
P05	HOUR COUNTER	Hour counter enabling
P07	COMMUNICATION (COMn)	Communication ports
P08	LIMIT THRESHOLDS (LIMn)	Limit thresholds on readings
P09	ALARMS (ALAn)	Alarm messages
P11	ENERGY PULSING (PULn)	Energy pulse count
P13	INPUTS (INPn)	Digital inputs
P14	OUTPUTS (OUTn)	Digital outputs

- Press ↻ to enter the selected menu.
- At this point you can select the submenu (if any) and then

MENU ▼ ▲ ↻
后退　　　增加/减小　　前进

设置：选择参数值

- 设置所需的参数值后，继续选择↻以在字母数字显示屏中编辑参数值。
- 按下 ▲ 或 ▼ 在允许范围内改变参数值。
- 同时按下 ▲ 和 ▼ 则将数值立即恢复到默认出厂设置。
- 同时按下 ▼ 和↻将数值设置为最小值；同时按下 ▲ 和↻将数值设置为最大值。

设置参数值

- 按下 **MENU** 保存参数值并返回上一级菜单，即参数选择。
- 重复按 **MENU** 退出并保存参数设置。设备将重启。
- 或者，在编程过程中按住 **MENU** 3 秒钟，即可直接保存更改并退出。
- 如果用户超过 2 分钟未按任何键，系统将自动退出设置并返回正常查看状态，而不会保存对参数所做的更改。
- 注意：设置数据（可使用键盘修改的设置）可备份保存在 DMG600-610 的 EEPROM 存储器中。该数据可在需要时恢复到工作存储器中。数据备份 "copy" 和 "restore" 命令可在 *Commands 菜单*中找到。

the sequential number of the parameter, always with the function keys as follows:

MENU ▼ ▲ ↻
　　Backward　Increment/decrement　Forward

Setting: Select the parameter number

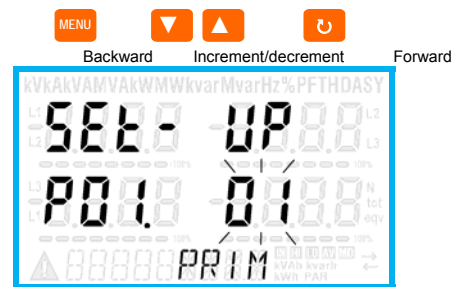- Once you set the number of the desired parameter, continuing with ↻ will switch to the parameter value editing, which is displayed in the alphanumeric display.
- Pressing ▲or ▼ the parameter value is changed within the allowed range.
- Pressing ▲ and ▼ at the same time the value is returned immediately to the default factory settings.
- By simultaneously pressing ▼ and ↻ and the value is set to the minimum possible, while using ▲ and ↻ to the maximum possible.

Parameter value setting

- Pressing the **MENU** parameter value is saved and you are returned to the previous level, that is the parameter selection.
- Press **MENU** repeatedly to exit and save the setting parameters. The device will reboot.
- Alternatively, from within the programming, holding **MENU** for three consecutive seconds will save the changes and exit directly.
- If the user does not press any key for more than 2 minutes, the system leaves the setup automatically and goes back to normal viewing without saving the changes done on parameters.
- N.B.: a backup copy of the setup data (settings that can be modified using the keyboard) can be saved in the eeprom memory of the DMG600-610. This data can be restored when necessary in the work memory. The data backup 'copy' and 'restore' commands can be found in the *Commands menu*.

参数表

- 下表列出了所有编程参数。对于每个参数，都列出了可用设置范围和出厂默认值，以及参数功能的简短说明。由于字符数限制，在某些情况下显示屏上显示的参数说明可能与表中的描述不同。但可使用参数代码作为参考。

P01 – GENERAL		度量单位	默认值	范围
P01.01	CT 一次电流	A	5	1-10000
P01.02	CT 二次电流	A	5	1-5
P01.03	额定电压	V	400	50-500000
P01.04	使用 VT		OFF	OFF-ON
P01.05	VT 一次电压	V	100	50-500000
P01.06	VT 二次电压	V	100	50-500
P01.07	接线		L1-L2-L3-N	L1-L2-L3-N L1-L2-L3 L1-L2-L3-N BIL L1-L2-L3 BIL L1-N-L2 L1-N

P01.01 – CT 一次绕组额定电流。
P01.02 – CT 二次绕组额定电流。
P01.03 – 系统额定电压。
P01.04 – 如果使用 VT 则设置为 ON。如果设置为 OFF，那么将忽略以下两个参数。
P01.05 –VT 一次绕组额定电压。
P01.06 –VT 二次绕组额定电压。
P01.07 – 根据所用接线图设置该参数。接线图见本手册最后一页。

P02 – UTILITY		度量单位	默认值	范围
P02.01	语言		English	English Italiano Francais Espanol P rtuguese
P02.02	高背光	%	10	0-100
P02.03	低背光	%	30	0-50
P02.04	低背光延时	秒	30	5-600
P02.05	默认返回页面	秒	60	OFF/10-600
P02.06	默认页面		VL-L	VL-L / VL-N …
P02.07	默认二级页面		INST	INST / HI / LO / AVG / MD
P02.08	显示屏更新时间	秒	0.5	0.1 – 5.0
P02.09	输出电能测量		OFF	OFF-ON
P02.10	相能测量		OFF	OFF-ON
P02.11	不对称测量		OFF	OFF-ON
P02.12	THD 测量		OFF	OFF/THD/THD+HAR
P02.13	功率不平衡测量		OFF	OFF-ON
P02.14	报警时背光闪烁		OFF	OFF-ON

P02.05 – 如果设置为 OFF，显示屏将一直显示用户离开时的页面。如果设置为延时，那么显示页面将在超过时间之后返回到 P02.06 中设置的页面。
P02.06 – 超过 P02.05 规定的按键输入等待时间后，显示屏自动返回的页面。
P02.07 – 超过 P02.05 规定时间后显示屏返回的二级页面。
P02.09 – 测量和可视化输出电能（市电）。
P02.10 – 测量和可视化各相电能。
P02.11 – 测量和可视化电压和电流不对称。
P02.12 – 启用电压和电流谐波的测量和显示。**THD =** 总谐波失真；**HAR =** 谐波高达 15 次。
P02.13 – 计算和可视化相的功率不平衡。
P02.14 – 显示屏背光，在显示报警时闪烁，以强调异常情况。

Parameter table

- Below are listed all the programming parameters in tabular form. For each parameter are indicated the possible setting range and factory default, as well as a brief explanation of the function of the parameter. The description of the parameter shown on the display can in some cases be different from what is reported in the table because of the reduced number of characters available. The parameter code can be used however as a reference.

P01 – GENERAL		UoM	Default	Range
P01.01	CT primary	A	5	1-10000
P01.02	CT se ondary	A	5	1-5
P01.03	Rated voltage	V	400	50-500000
P01.04	Use VT		OFF	OFF-ON
P01.05	VT primary	V	100	50-500000
P01.06	VT secondary	V	100	50-500
P01.07	Wiring		L1-L2-L3-N	L1-L2-L3-N L1-L2-L3 L1-L2-L3-N BIL L1-L2-L3 BIL L1-N-L2 L1-N

P01.01 – CT primary winding rated current.
P01.02 – CT secondary winding rated current.
P01.03 – System rated voltage.
P01.04 – Set to ON if VT are used. If set to OFF, the following two parameters will be ignored.
P01.05–VT primary winding rated voltage.
P01.06 –VT secondary winding rated voltage.
P01.07 – Set this parameter according to the used wiring diagram. See witring diagrams on last pages of the manual.

P02 – UTILIT		UoM	Default	Range
P02.01	Language		English	English Italiano Francais Espanol Portuguese
P02.02	High backlight level	%	100	-10
P02.03	Low backlight level	%	30	0-50
P02.04	Low backlight delay	s	30	5-600
P02.05	Default page return	s	60	OFF / 10-600
P02.06	Default page		VL-L	VL-L / VL-N …
P02.07	Default sub-page		INST	INST / HI / LO / AVG / MD
P02.08	Display update time	s	0.5	0.1 – 5.0
P02.09	Exported energy measure		OFF	OFF-ON
P02.10	Phase energy meaure		OFF	OFF-ON
P02.11	Asymmetry measure		OFF	OFF-ON
P02.12	THD measure		OFF	OFF/THD/THD+HAR
P02.13	Power unbalance measurement		OFF	OFF-ON
P02.14	Backlight flash when in alarm		OFF	OFF-ON

P02.05 – If set to OFF the display always remains in the page where the user left it. If set to a time delay, after that time the display page goes back to page set in P02.06.
P02.06 – Number of the page to which the display returns automatically after time specified by P02.05 has elapsed from the last keystroke.
P02.07 – Sub-page type to which the display returns after P02.05 has elapsed.
P02.09 – Enables measurement and visualization of exported Energy (generated in the mains).
P02.10 – Enables measurement and visualization of energies for eacj pahase.
P02.11 – Enables measurement and visualization of voltage and current asymmetry.
P02.12 – Enables measurement and visualization of voltage and current harmonics. **THD** = total harmonic distortion; **HAR** = harmonic contributions up to 15th order.
P02.13 – Enables calculation and visualization of phase power unbalance.
P02.14 – In presence of an alarm, the display backlight flashes in order to highlight the abnormal situation.

P03 – PASSWORD	度量单位	默认值	范围
P03. 1 激活密码		OFF	OFF-ON
P03.02 用户级别密码		1000	0- 999
P03.03 高级密码		2000	0-9999

P03.01－如果设置为 OFF，密码管理将禁用，允许随意访问设置和命令菜单。
P03.02 – 激活 P.03.01 时，为用户配置访问密码。
P03.03 – 同 P03.02 类似，但配置的是高级访问密码。

P03 – PASSWORD	UoM	Default	Range
P03.01 Enable passwords		OFF	OFF-ON
P03.02 User level password		1000	0-9999
P03.03 Advanced level password		2000	0-9999

P03.01 – If set to OFF, password management is disabled and the access to setup parameters and command menu is allowed.
P03.02 – When P.03.01 enabled, value to be specified to get user access.
P03.03 – Like P03.02, but referred to advanced access.

P04 – INTEGRATION	度量单位	默认值	范围
P04.01 积分模式		Shift	Fixed Shift Synchr. us
P04.02 功率积分时间	分	15	1-60 分钟
P04. 3 电 积分时间	分	15	1-60 分钟
P04.04 电压积分时间	分	1	1-60 分钟
P04.05 频率积分时间	分	1	1-60 分钟

P04.01 –选择平均读数计算方法：
Fixed =读数在设置时间内积分。每次积分时间过后，平均值同上次积分结果一同更新。
Shift =瞬时值在设定时间 1/15 的时间内积分。这段时间过后，计算的新值将替换最早的旧值。平均值每隔设定时间 1/15 的时间更新一次，鉴于时间滑动窗口，该窗口组的最后 15 计算值，总长度等于积分时间设置。
Sync =同 fixed 模式类似，但积分时间间隔由通过同步功能编程的外部数字输入启动。
Bus =同 fixed 模式类似，但积分时间间隔由串行总线上的通讯消息启动。
P04.02 - 平均读数积分时间，用于有功、无功和视在功率。
P04.03、**P04.04**、**P04.05** - 相应测量的读数积分时间 (AVG)。

P04 – INTEGRATION	UoM	Default	Range
P04.01 Integration mode		Shift	Fixed Shift Synchr. Bus
P04.02 Power integration time	min	15	1-60min
P04.03 Current integration time	min	15	1-60min
P04.04 Voltage integration time	min	1	1-60min
P04.05 Frequency integration time	min	1	1-60min

P04.01 –Selection of average reading calculation method:
Fixed = Readings are integrated for the set time. Every time the integration time elapses, the Average value is updated with the result of the last integration.
Shift = The instantaneous values are integrated for a period f time equal to $1/15^{th}$ of the set time. Every time this interval elapses, the oldest value is replaced with the new one just calculated. The average value is updated every $1/15^{th}$ of the time set, considering a time-sliding window that groups the last 15 calculated values, with a total length equal to integration time setting.
Sync = Like fixed mode, but the integration intervals are started by an external digital input programmed with Synchronization function.
Bus = Like fixed mode, but the integration intervals are started by communication messages on the serial bus.
P04.02 - Average readings integration time, used for active, reactive and apparent power.
P04.03, P04.04, P04.05 - Readings integration time (AVG) for the correspondent measurements.

P05 – HOUR COUNTER	度量单位	默认值	范围
P05.01 激活总计时器		ON	OF -ON
P05.02 激活分计计时器		ON	OFF-ON- I Px-LIMx
P05.03 通道编号 (x)		1	1-4

P05.01 - 如果设置为 OFF，那么计时器将禁用且不显示计时器页面。
P05.02 - 如果设置为 OFF，那么分计计时器读数不会增加。如果设置为 ON，那么只要 DMG 一直通电，时间就会逐渐增加。如果连接至内部变量 (LIMx-INPx)，那么只有当该变量为真值时，时间才会增加。
P05.03 - 前一个参数最终使用的变量的通道编号 (x)。例：如果分计计时器必须计算测量值高于某一门限值（如 LIM3 界定的门限值）的时间，那么需要将 LIM 编程写入前一个参数，并将通道 3 编程写入本参数。

P05 – HOUR COUNTER	UoM	Default	Range
P05.01 Hour counters general enable		ON	OFF-ON
P05.02 Partial hour counter enable		ON	OFF-ON- INPx-LIMx
P05.03 Channel number (x)		1	1-4

P05.01 - If set to OFF the hour meter s are disabled and the hour meter page is not shown.
P05.02 - If set to OFF, the partial hour meter is not incremented. If ON, time is incremented as long as DMG is powered. If linked to one of the internal variables (LIMx-INPx) it is incremented only when the variable is true.
P05.03 - Number of the channel (x) of the variable eventually used in the previous parameter. Example: If the partial hour counter must count the time during which one measurement is above a certain threshold, e.g. defined by LIM3, then it is necessary to program LIM in the previous parameter and channel 3 in this parameter.

P07 – COMMUNICATION（COMn，n=1-2）	度量单位	默认值	范围
P07.n.01 串行节点地址		01	01-255
P07.n.02 串行速度	bps	9600	1200 2400 4800 9600 19200 38400 57600 115200
P07.n.03 数据格式		8 bit – n	8 bit, no parity 8 bit, odd 8bit, even 7 bit, odd 7 bit, even
P07.n.04 停止位		1	1-2
P07.n.05 协议		Modbus RTU	Modbus RTU Modbus ASCII Modbus TCP
P07.n.06 IP 地址		000.000.000.000	000.000.000.000 - 255.255.255.255
P07.n.07 子网掩码		000.000.000.000	000.000.000.000 - 55.255.255.255
P07.n.08 IP 端口		1001	0- 2000
P07.n.09 客户端/服务器		Server	Client Server
P07.n.10 远程 IP 地址		000.000.000.000	000.000.000.000 – 255.255.255.255
P07.n.11 远程 IP 端口		1001	0-32000
P07.n.12 网关 IP 地址		000.000.000.000	000.000.000.000 – 255.255.255.2 5

注：本菜单分为 **2** 部分，分别针对通讯通道 **COM1** 和 **COM2**。对于 **DMG610**，通道 **COM1** 为内置 **RS-485** 接口，而 **COM2** 为 **EXP** 模块的最终第二通讯端口。
P07.n.01－通讯协议的串行地址（节点编号）。
P07.n.02－串行通讯速度。
P07.n.03 – 数据格式。7 位设置只可用于 ASCII 协议。
P07.n.04 – 停止位数。
P07.n.05 – 选择通讯协议。

P07 – COMMUNICATION (COMn, n=1..2)	UoM	Default	Range
P07.n.01 Serial node address		01	01-255
P07.n.02 Serial speed	bps	9600	1200 2400 4800 9600 19200 38400 57600 115200
P07.n.03 Data format		8 bit – n	8 bit, no parity 8 bit, odd 8bit, even 7 bit, odd 7 bit, even
P07.n.04 Stop bits		1	1-2
P07.n.05 Protocol		Modbus RTU	Modbus RTU Modbus ASCII Modbus TCP
P07.n.06 IP Address		000.000.000.000	000.000.000.000 - 255.255.255.255
P07.n.07 Subnet mask		000.000.000.000	000.000.000.000 - 255.255.255.255
P07.n.08 IP port		1001	0-32000
P07.n.09 Client/Server		Server	Client Server
P07.n.10 Remote IP address		000.000.000.000	000.000.000.000 – 255.255.255.255
P07.n.11 Remote IP port		1001	0-32000
P07.n.12 Gateway IP address		000.000.000.000	000.000.000.000 – 255.255.255.255

Note: this menu is divided into 2 sections, for comm channels COM1..2. For DMG610, channel COM1 is the built-in RS-485 interface, while COM2 is the evntual second communication port of an EXP module.
P07.n.01 – Serial address (node number) for the communication protocol.
P07.n.02 – Serial communication speed.
P07.n.03 – Data format. Can be set to 7 bits only for ASCII protocol.
P07.n.04 – Number of stop bits.
P07.n.05 – Communication protocol selection.

P08 – LIMIT TRESHOLDS（LIMn, n=1-8）	度量单位	默认值	范围
P08.n.01 基准测量		OFF	OFF - （测量值）
P08.n.02 函数		Max	Max – Min – Min+Max
P08.n.03 上限值		0	-9999 - +9999
P08.n.04 乘数		x1	/100 – x10k
P08.n.05 延时	秒	0	0.0 – 600.0
P08.n.06 下限值		0	-9999 - +9999
P08.n.07 乘数		x1	/100 – x10k
P08.n.08 延时	秒	0	0.0 – 600.0
P08.n.09 正常状态		OFF	OFF-ON
P08.n.10 锁存		OFF	OFF-ON
P08.n.11 门限激活		OFF	OFF-INP-LIM-ALA-REM
P08.n.12 通道号（X）		1	1-8

P08 – LIMIT TRESHOLDS (LIMn, n=1..8)	UoM	Default	Range
P08.n.01 Reference measure		OFF	OFF- (measures)
P08.n.02 Function		Max	Max – Min – Min+Max
P08.n.03 Upper threshold		0	-9999 - +9999
P08.n.04 Multiplier		x1	/100 – x10k
P08.n.05 Delay	s	0	0.0 – 600.0
P08.n.06 Lower threshold		0	-9999 - +9999
P08.n.07 Multiplier		x1	/100 – x10k
P08.n.08 Delay	s	0	0.0 – 600.0
P08.n.09 Normal status		OFF	OFF-ON
P08.n.10 Latch		OFF	OFF-ON
P08.n.11 Limit enable		OFF	OFF-INP-LIM-ALA-REM
P08.n.12 Channel number (x)		1	1-8

注：此菜单分为 8 个部分，极限阈值 LIM1..8
P08.n.01 – 定义多功能电表测量值中必须同限值相比较的测量值。
P08.n.02 – 门限的函数。该函数可为：
Max = 当测量值大于 P08.n.03 时，激活 LIMn。P08.n.06 是重置门限值。
Min = 当测量值小于 P08.n.06 时，激活 LIMn。P08.n.03 是重置门限值。
Min+Max= 当测量值大于 P08.n.03 或小于 P08.n.06 时，激活 LIMn。
P08.n.03 和 P08.n.04 - 用于规定上限门限值，该值为 P08.n.03 设定值乘以 P08.n.04 的结果。
P08.n.05 - 触发上限门限值延时。
P08.n.06、P08.n.07、P08.n.08 - 与前文所述相似，但指下限门限值。
P08.n.09 - 允许反转限值 LIMn 的状态。
P08.n.10 - 当门限值仍被锁存时，规定是需要手动重置 (ON) 还是自动重置 (OFF)。
P08.n.11 - 门限激活。 如果关闭，门限始终处于活动状态，否则当编程源有效时启用门限。
P08.n.12 - 通道号（X）指前一个参数。

Note: this menu is divided into 8 sections, for limit thresholds LIM1..8
P08.n.01 – Defines which measurement of the multimeter must be compared with limits.
P08.n.02 – Function of the limit threshold. It can be:
Max = LIMn active when the measurement is higher than P08.n.03. P08.n.06 is the reset threshold..
Min = LIMn active when the measurement is lower than P08.n.06. P08.n.03 is the reset threshold.
Min+Max = LIMn active when the measurement is higher than P08.n.03 or is lower than P08.n.06.
P08.n.03 e P08.n.04 - Used to define the upper threshold, that is made of the value set in P08.n.03 multiplied by P08.n.04.
P08.n.05 - Trip delay on upper threshold.
P08.n.06, P08.n.07, P08.n.08 - Like above, referred to lower threshold.
P08.n.09 - Allows to invert the status of the limit LIMn.
P08.n.10 - Defines if the threshold remains latched and thus needs to be reset manually (ON) or if it is reset automatically (OFF).
P08.n.11 –Limit enabling source. If OFF the limit is always active, otherwise the limit is enabled when the programmed source is active.
P08.n.12 - Channel number (x) referred to the previous parameter.

P09 – ALARMS（ALAn, n=1-4）		默认值	范围
P09.n.01	报警源	OFF	OFF-LIMx-INPx
P09.n.02	通道编号 (x)	1	1-8
P09.n.03	锁存	OFF	OFF-On
P09.n.04	优先权	ow	Low-High
P09.n.05	文本	ALAn	（文本－ 16 个字符）

注：本菜单分为 4 部分，分别针对报警 ALA1 到 ALA4。
P09.n.01 - 触发报警的信号。该信号可以是超过门限 (LIMx) 或激活外部输入 (INPx)。
P09.n.02 - 同前一个参数相关的通道编号 (x)。
P09.n.03 - 报警仍被锁存时，规定是需要手动重置 (ON) 还是自动重置 (OFF)。
P09.n.04 - 如果报警具有高优先级，那么当该报警激活时，显示页面自动切换到报警页面，并显示报警和警告图标。如果报警的优先级设置为低，那么页面保持不变并显示"信息"图标。
P09.n.05 - 报警的自由文本。最多可输入 16 个字符。

P11 – PULSES（PULn, n=1-2）		默认值	范围
P11.n.01	源测量值	OFF	OFF、kWh+、kWh-、kvarh+、 varh-、kV h
P 1.n.02	计数单位	100	10/100/1k/10k
P11.n.03	脉冲持续时间	0.1	0.01-1.00

注：本菜单分为 2 部分，分别针对电能计数脉冲 PUL1 和 PUL2
P11.n.01 = 脉冲连接的电能类型。
P11.n.02 = 各脉冲电能能量。（如：10Wh、100Wh、1kWh 等等）。
P11.n.03 = 脉冲持续时间。

P13 – INPUTS（INPn, n=1-4）		度量单位	默认值	范围
P13.n.01	输入功能		OFF	OFF – O – LOCK - SYNC- C01-C08
P13.n.02	正常状态		OFF	OFF-ON
P13.n.03	激活延时	秒	0.05	0.00 – 600.00
P1 .n.04	禁用延时	秒	0.05	0.00 – 600.00

P09 – ALARMS (ALAn, n=1..4)		Default	Range
P09.n.01	Alarm source	OFF	OFF-LIMx-INPx
P09.n.02	Channel number (x)	1	1-8
P09.n.03	Latch	OFF	OFF-On
P09.n.04	Priority	Low	Low-High
P09.n.05	Text	ALAn	(text – 16 char)

Note: this menu is divided into 4 sections, for alarms ALA1..4
P09.n.01 - Signal that generates the alarm. It can be the overcoming of a limit threshold (LIMx), the activation of an external input (INPx).
P09.n.02 - Channel number (x) referred to the previous parameter.
P09.n.03 -Defines if the alarm remains latched and has to be reset manually (ON) or if it automatically resets (OFF).
P09.n.04 - If the alarm has high priority, when it is activated the display page switches automatically on the alarm page, and the alarm is shown with the Warning icon. If instead the priority level is set to Low, the page does not change and it is shown with the 'information' icon.
P09.n.05 - Free text of the alarm. Max 16 chars.

P11 – PULSES (PULn, n=1..2)		Default	Range
P11.n.01	Source measurement	OFF	OFF, kWh+, kWh-, kvarh+, kvarh-, kVAh
P11.n.02	Count unit	100	10/100/1k/10k
P11.n.03	Pulse duration	0.1	0.01-1.00

Note: this menu is divided into 2 sections, for energy count pulses PUL1..2
P11.n.01 = Type of energy to which the pulse is linked to.
P11.n.02 = Quantity of energy for each pulse. (e.g. 10Wh, 100Wh, 1kWh etc.).
P11.n.03 = Pulse duration.

P13 – INPUTS (INPn, n=1..4)		UoM	Default	Range
P13.n.01	Input function		OFF	OFF – ON – LOCK - SYNC- C01…C08
P13.n.02	Normal status		OFF	OFF-ON
P13.n.03	ON delay	s	0.05	0.00 – 600.00
P13.n.04	OFF delay	s	0.05	0.00 – 600.00

注：本菜单分为 4 部分，分别针对数字输入 INP1 到 INP4
P13.n.01 =输入功能：
OFF – 禁用输入
ON – 输入启用，用作计数器源等
LOCK – 设置锁定。不允许各级用户访问设置。
SYNC – 功率/电能积分同步。
C01-C08 – 当激活（边缘触发）这一输入时，命令菜单中的相应命令
　　　即被执行。
P13.n.02 = 输入的正常状态。可反转 INPn 激活逻辑。
P13.n.03 – P13.n.04 = 对输入激活/去活的延时。允许过滤输入状态
　　　以避免反弹。

P14 – OUTPUTS（OUTn，n=1-4）		度量单位	默认值	范围
P14.n.01	输出功能		OFF	OFF-ON-SEQ-LIMx-ALAx-PULx-REMx
P14.n.02	通道编 （ ）		1	1 – 8
P14.n.03	闲置状态		OFF	OFF-ON
P14.n.04	激活延时	秒	0	0.0-6000.0
P14.n.05	禁用延时	秒	0	0.0-6000.0

注：本菜单分为 4 部分，分别针对数字输出 OUT1 到 OUT4
P14.n.01 = 输出功能：
OFF – 禁用输出
ON – 始终激活输出
SEQ – 相序错误时激活输出
LIMx – ALAx – PULx – REMx – 连接到可编程变量状态的输出。 允许将输出的状态连接到门限阈值、报警等的状态。
P14.n.02 = 同前一个参数相关的通道编号 (x)。
P14.n.03 = 输出的正常状态。可反转输出函数的逻辑。
P14.n.04 = 接通延时。
P14.n.05 = 断开延时。

报警

- 当报警生成时，显示屏将显示报警图标和代码，并以所选语言显示报警说明。
- 激活实用程序菜单中的相应参数时，显示屏的背光将在出现报警时闪烁，以强调异常情况。
- 如果按下页面中的导航键，显示报警说明的滚动消息将暂时消失，30 秒后再次显示。
- 报警重置取决于 P09.n.03 参数的设置。该设置规定报警在报警条件消失后是自动重置还是手动重置。

Alarms

- When an alarm is generated, the display will show an alarm icon, the code and the description of the alarm in the language selected.
- Enabling the appropriate parameter of the utility menu, the display backlight flashes in presence of an alarm in order to highlight the anomaly.
- If the navigation keys in the pages are pressed, the scrolling message showing the alarm indications will disappear momentarily, to reappear again after 30 seconds.
- The alarm reset is conditional on the setting of parameter P09.n.03, which defines whether it can be automatic after the disappearance of the alarm conditions or if you require a manual reset.

命令菜单

- 通过命令菜单可以执行一些非经常性操作，例如峰值读数重置、计数器清零、报警重置等。
- 如果输入了高级密码，可通过命令菜单执行有益于设备配置的自动操作。
- 下表按所需访问级别列出了命令菜单中的可用功能。

代码	命令	访问级别	说明
C.01	RESET HI-LO	用户/高级	重置所有读数的 HI 和 LO 峰值。
C.02	RESET MAX DEMAND	用户/高级	重置所有读数的最大需量。
C.03	RESET PARTIAL ENERGY METER	用户/高级	分计电能表清零。
C.04	RESET PARTIAL HOUR COUNTER	用户/高级	分计计时器清零
C.07	RESET ALARMS	用户/高级	锁存报警清零。
C.08	RESET LIMITS	用户/高级	锁存门限清零。
C.11	RESET TOTAL ENERGY METER	高级	总计和分计电能表清零。
C.12	RESET TOTAL HOUR COUNTERS	高级	总计和分计计时器清零。
C.13	PARAMETERS TO DEFAULT	高级	重置所有设置参数为出厂默认值。
C.14	PARAMETERS BACKUP	高级	保存所有设置参数的备份。
C.15	PARAMETERS RESTORE	高级	将设置参数恢复为备份值。
C.16	WIRING TEST	高级	进行接线测试以检查 DMG 接线是否正确。参见*接线测试*章节。

- 选定所需命令后，按下 ↻ 执行该命令。设备将显示确认提示。再次按 ↻，该命令将开始执行。
- 如需取消执行命令，则按 **MENU**。
- 如需退出命令菜单，则按 **MENU**。

接线测试

- 接线测试用于核实 DMG 设备是否已正确连接。
- 为执行此测试，必须将设备连接至一个满足下述条件的激活设备：
  - 三相系统且各相均存在(V > 50VAC PH-N)。
  - 流入各相的电流 > CT 一次电流的 1%。
  - 电能正向流动（常规情况下，工厂中电感性负荷从电网吸取功率）。
- 要执行测试，进入命令菜单并根据*命令菜单*说明选择命令 C.16。
- 此测试用于核实以下几点：
  - 三个电压相位的读数
  - 相序
  - 电压不平衡
  - 各 CT 的反转极性
  - 电压和电流相位的错配。
- 如果测试不成功，那么显示屏将显示失败原因。

Commands menu

- The commands menu allows executing some occasional operations like reading peaks resetting, counters clearing, alarm reset, etc.
- If the Advanced level password has been entered, then the commands menu allows executing the automatic operations useful for the device configuration.
- The following table lists the functions available in the commands menu, divided by the access level required.

Cod.	COMMAND	ACCESS LEVEL	DESCRIPTION
C.01	RESET HI-LO	User / Advanced	Reset of HI and LO peaks of all readings
C.02	RESET MAX DEMAND	User / Advanced	Reset of Max Demand of all readings
C.03	RESET PARTIAL ENERGY METER	User / Advanced	Clears partial Energy meters
C.04	RESET PARTIAL HOUR COUNTER	User / Advanced	Clears partial hour counter
C.07	RESET ALARMS	User / Advanced	Clears alarms with latch
C.08	RESET LIMITS	User / Advanced	Clears limit thresholds with latch
C.11	RESET TOTAL ENERGY METER	Advanced	Clears total and partial energy meters
C.12	RESET TOTAL HOUR COUNTERS	Advanced	Clears total and partial hour counters
C.13	PARAMETERS TO DEFAULT	Advanced	All setup parameters are resetted to factory default value
C.14	PARAMETERS BACKUP	Advanced	Saves a backup copy of all setup parameters
C.15	PARAMETERS RESTORE	Advanced	Restores the setup parameters to backup values
C.16	WIRING TEST	Advanced	Carries out the wiring test in order to check proper wiring of the DMG. See *Wiring test* chapter

- Once the required command has been selected, press ↻ to execute it. The device will prompt for a confirmation. Pressing ↻ again, the command will be executed.
- To cancel the command execution press **MENU**.
- To quit command menu press **MENU**.

Wiring test

- The wiring test allows to verify if the connection of the DMG device has been executed properly.
- To be able to execute the test, the device must be connected to an active plant, with the following conditions:
  - three-phase system with all phases presence (V > 50VAC PH-N)
  - current flowing in each phase > 1% of the CT primary.
  - positive flow of energies (that is a normal plant where the inductive load draws power from the supplier).
- To launch test execution, enter command menu and select command C.16 as per *Commands menu* instructions.
- The test allows to verify the following points:
  - reading of the three voltage phases
  - phase sequence
  - voltage unbalance
  - reverse polarity of each CT
  - mismatch between voltage and current phases.
- If the test does not succeed, the display shows the reason of the failure.

CX01 加密狗用法

- 借助 CX01 加密狗，您可通过前置光学接口的 USB 端口连接至任何 PC。
- 将加密狗插入设备前端端口即可连接至 DMG 600-610，即使设备处于上电状态时亦可进行此操作。
- 尽管建议保持其 LED 朝上，但倒置也可工作。
- 与普通 USB 端口相比，其连接具有电气安全性，因为其采用光电隔离措施、在工业环境下防灰防潮并提供高速传输能力。加密狗可在任何时候移除，无需提前在 PC 侧关闭。
- CX01 设计用于通过临时连接对所有带前置光学接口的 Lovato 设备进行编程和/或维护。

CX02 加密狗用法

- CX02 加密狗提供 WiFi 接入点功能，用于连接 PC、平板电脑或智能手机。除了这一功能，它还可以与 DMG600-610 互传并存储数据。
- 将 CX02 接口插入 DMG600-610 前面板上的 IR 端口。
- 按住按钮 2 秒钟启动 CX02。
- 等待 *LINK* LED 闪烁橙色。
- 连续快速按加密狗按钮 3 次。
- 此时，DMG600-610 的显示屏将显示前 6 个可用命令 (D1 - D6)。
- 按 ▲ ▼ 可选择所需命令。
- 按 ↻ 可执行所选命令。设备将显示确认提示 (OK?)。再按一次 ↻ 确认，或按 **MENU** 取消操作。
- 下表列出了可用命令：

代码	命令	说明
D1	SETUP DEVICE ➜CX02	将设置参数从 DMG600-610 复制到 CX02。
D2	SETUP CX02 ➜DEVICE	将设置参数从 CX02 复制到 DMG600-610。
D3	CLONE DEVICE ➜CX02	将设置参数和工作数据从 DMG600-610 复制到 CX02。
D4	CLONE CX02 ➜DEVICE	将设置参数和工作数据从 CX02 复制到 DMG600-610。
D5	INFO DATA CX02	显示关于存储在 CX02 中的数据的信息。
D6	EXIT	退出加密狗菜单。

- 有关其他详细信息，请参见 CX02 操作手册。

CX01 Dongle usage

- The CX01 dongle allows you to connect to any PC with a USB port to the front optical interface.
- It can be connected to the DMG 600-610 inserting it into the slots at the front, even when the device is powered.
- Despite having a preferential side (LED on top) it works even if it is placed upside down.
- In contrast to the common USB port, the connection is electrically safe because optically isolated, resistant to dust and moisture in industrial environments and provides high-speed transfer. The dongle can be removed at any time without the need to be turned off in advance on the PC side.
- The CX01 is designed for a temporary connection and is used for programming and / or maintenance of all Lovato devices provided with front optical interface.

CX02 Dongle usage

- The CX02 dongle offers WiFi Access point capability for connection to PC, Tablet or smartphones. In addition to this function it also offer the possibility to store and transfer a block of data from/to the DMG600-610.
- Insert the interface CX02 into the IR port of DMG600-610 on the front plate.
- Switch CX02 on by pressing the button for 2 sec.
- Wait until the *LINK* LED becomes orange flashing.
- Press 3 times consecutively and fast the dongle button.
- At this point the display of the DMG600-610 shows the first of the 6 possible commands (D1…D6).
- Press ▲ ▼ to select the desired command.
- Press ↻ to execute the selected command. The unit will prompt for a confirmation (OK?). Press once again ↻ to confirm or MENU to cancel.
- The following table lists the possible commands:

COD	COMMAND	DESCRIPTION
D1	SETUP DEVICE ➜CX02	Copies Setup settings from DMG600-610 to CX02.
D2	SETUP CX02 ➜DEVICE	Copies Setup settings from CX02 to DMG600-610.
D3	CLONE DEVICE ➜CX02	Copies Setup settings and working data from DMG600-610 to CX02.
D4	CLONE CX02 ➜DEVICE	Copies Setup settings and working data from CX02 to DMG600-610.
D5	INFO DATA CX02	Shows information about data stored into CX02.
D6	EXIT	Exits from dongle menu.

- For additional details see CX02 Operating manual.

安装

- DMG600-610 设计为柜面式安装。正确安装能确保前面板保护等级达到 IP54。
- 在面板内侧，将四个固定夹分别放入两条滑轨中的一条，然后按住固定夹的棱脊，直到将其卡入到第二条滑轨。
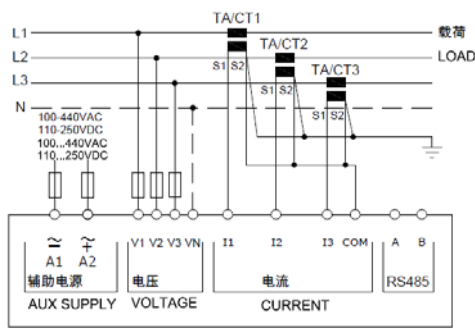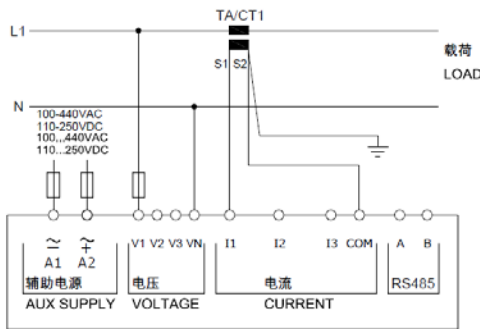- 按住固定夹的两侧向前推，让它滑入导轨，直到完全紧贴面板的内表面。

Installation

- DMG600-610 is designed for flush-mount installation. With proper mounting, it guarantees IP54 front protection.
- From inside the panel, for each four of the fixing clips, position the clip in one of the two sliding guide, then press on the clip corner until the second guide snaps in.
- Push the clip forward pressing on its side and making it slide on the guides until it presses completely on the internal surface of the panel.

- 有关电气连接，请参见特定章节中的接线图以及技术特性表中所述的要求。

- For the electrical connection see the wiring diagrams in the dedicated chapter and the requirements reported in the technical characteristics table.
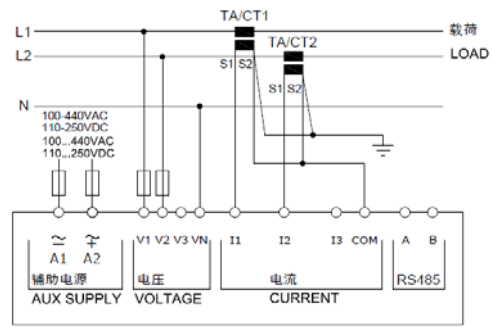
三相连接，带或不带中性线
3-phase connection whit or without neutral
P01.07 = L1-L2-L3-N   L1-L2-L3

两相连接
2-phase connection
P01.07 = L1-N-L2

单相连接
Single-phase connection
P01.07 = L1-N

平衡三相连接，带或不带中性线
Balanced 3-phase connection whit or without neutral
P01.07 = L1-L2-L3-N-BIL   L1-L2-L3-BIL
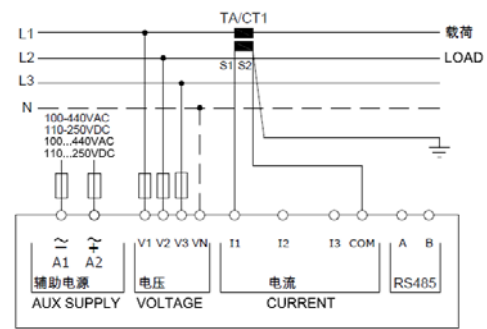
ARON 连接 **3** 相，不带中性线
ARON connection 3-phase without neutral
P01.07 = L1-L2-L3
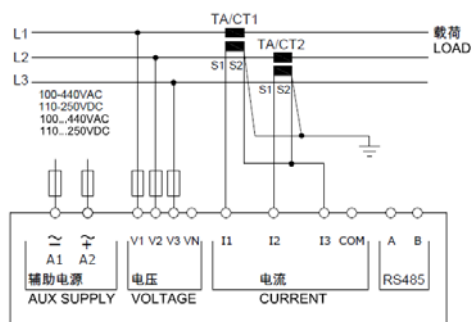
ARON 连接 **3** 相，不带中性线
ARON connection 3-phase without neutral
P01.07 = L1-L2-L3
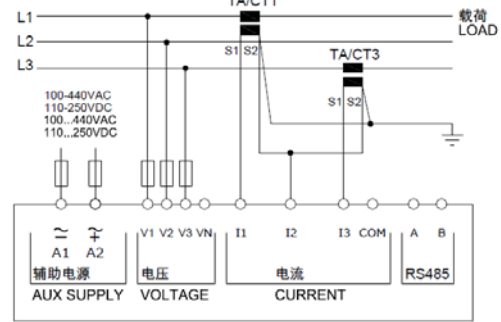
经电压互感器 3 相连接，带中性线
3 phase connection with neutral via VT
设置 P01.04、P01.05 和 P01.06 – Set P01.04, P01.05 and P01.06
P01.07 = L1-L2-L3-N
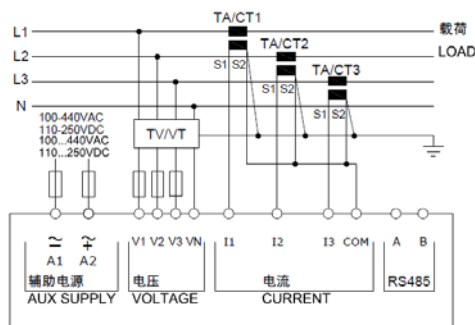
经电压互感器 3 相连接，不带中性线
3 phase connection without neutral via VT
设置 P01.04、P01.05 和 P01.06 – Set P01.04, P01.05 and P01.06
P01.07 = L1-L2-L3

备注
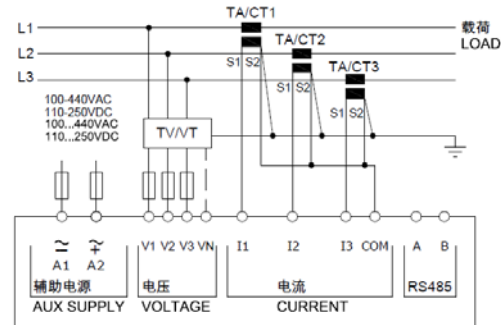
NOTES

推荐使用保险丝：
辅助电源和测量输入电压：F1A（快速）。

Recommended fuses:
aux supply and measure inputs voltage: F1A (fast).

最大 1200m
Max 1200m

PC PC

电缆
Cable
51C4

120R

RS485   RS485

TR A B SG
接口转换器
Interface converter
RS232/485

DMG610 n°31   DMG610 n°1   PX1

最大 1200m   最大 1200m
Max 1200m   Max 1200m

PC PC

电缆
Cable
51C4

重复本接线图
连接最多 255 台设备。
Repeat this wiring diagram
up to 255 devices.

TR A B SG
接口转换器
Interface converter
RS232/485

PX1
设置为中继器
Set as repeater

DMG610
设备地址 n° 31-60
Device addresses n° 31-60

TR A B SG
接口转换器
Interface converter
RS232/485

PX1
设置为中继器
Set as repeater

DMG610
设备地址 n° 1-30
Device addresses n° 1-30

TR A B SG
接口转换器
Interface converter
RS232/485

PX1

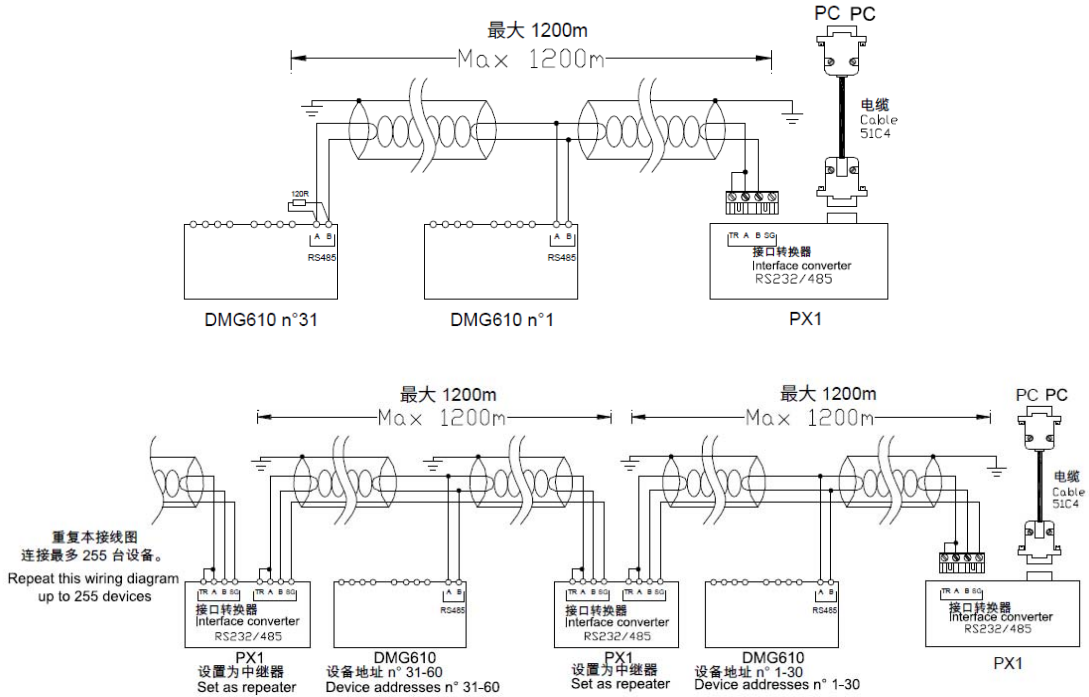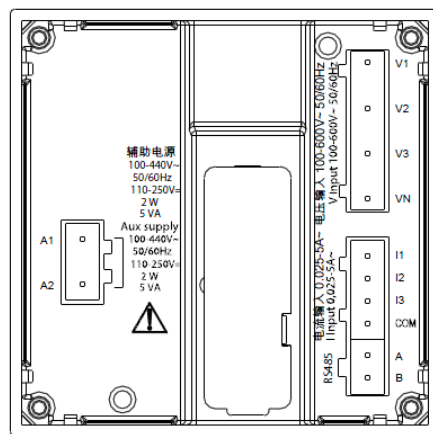| 远程控制 - Remote control		
订货代码 Order code	说明 Description	Wt [kg] Wt [kg]
4PX1 **(1)**	*RS-232/RS-485 光隔离转换器驱动 220-240VAC 电源* *RS-232/RS-485 opto-isolated converter drive 220…240VAC supply*	0,600
51C4	*PC- ↔ RS-232/RS-485 转换器驱动连接电缆，长 1.8 米* *PC- ↔ RS-232/RS-485 converter drive connection cable, 1.8 meters long*	0,147
(1)	*RS-232/RS-485 光隔离转换器驱动，38,400 波特率（最大值），自动或手动 TRANSMIT 线监管，220-240VAC ±10% 供电（根据要求可提供 110-120VAC）。* *RS-232/RS-485 opto-isolated converter drive, 38,400 Baud-rate max, automatic or manual TRANSMIT line supervision, 220…240VAC ±10% supply (possible 110…120VAC on request).*	

端子位置   **Terminals position**

DMG600   **DMG610**

辅助电源
100-440V~
50/60Hz
110-250V=
2 W
5 VA
Aux supply
100-440V~
50/60Hz
110-250V=
2 W
5 VA

电压输入 100-600V~ 50/60Hz
Vinput 100-600V~ 50/60Hz

电流输入 0.025-5A~
Iinput 0.025-5A~

A1 A2

V1 V2 V3 VN

I1 I2 I3 COM

RS485 A B

辅助电源
100-440V~
50/60Hz
110-250V=
2 W
5 VA
Aux supply
100-440V~
50/60Hz
110-250V=
2 W
5 VA

电压输入 100-600V~ 50/60Hz
Vinput 100-600V~ 50/60Hz

电流输入 0.025-5A~
Iinput 0.025-5A~

A1 A2

V1 V2 V3 VN

I1 I2 I3 COM

RS485 A B
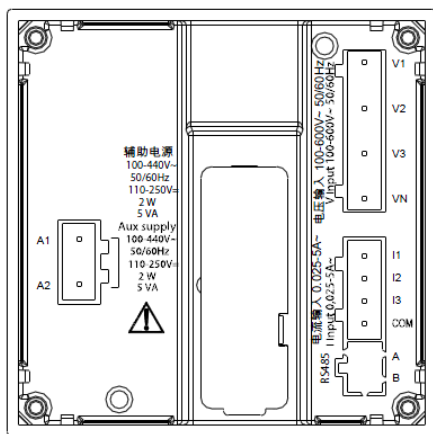
机械尺寸和屏柜开孔尺寸 (mm)   Mechanical dimensions and front panel cutout (mm)
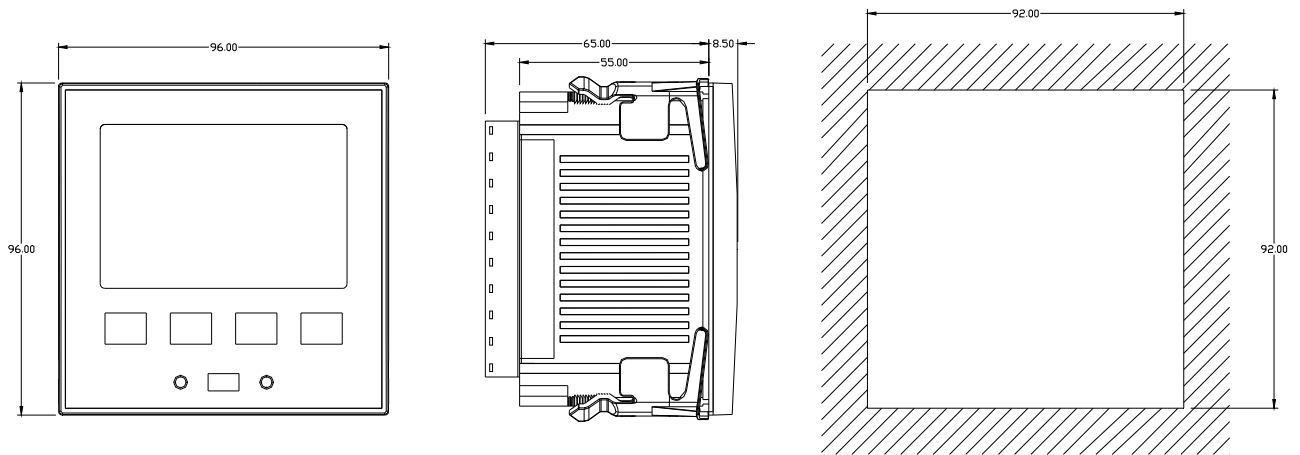
技术规格

电源	
额定电压 Us ❶	100 - 440V~
	110 - 250V=
工作电压范围	90 - 484V~
	93.5 - 300V=
频率	45 - 66Hz
功耗	2W – 5VA
掉电保持	>= 20ms
推荐使用保险丝	F1A（快速）
电压输入	
最大额定电压 Ue	600VAC L-L (346VAC L-N)
测量范围	50-720V L-L (415VAC L-N)
频率范围	45-65Hz
测量方法	真均方根
测量输入阻抗	L-N - L-L > 8MΩ
接线方式	单相、两相、三相（带或不带中性线）或平衡三相系统。
推荐使用保险丝	F1A（快速）
电流输入端	
额定电流 Ie	1A~ 或 5A~
测量范围	5A：0.025 - 6A~
	1A：0.025 - 1.2A~
输入类型	外部电流互感器提供的分路（低电压）。最大 5A
测量方法	真均方根
过载容量	+20% Ie
过载峰值	1s 为 50A
负荷（各相）	≤0.6VA
测量精度	
测量条件 温度	+23°C ±2°C
相电压	± 0.5% (50-480V~) ±0.5 位
线电压	± 0.5% (80-830V~) ±0.5 位
电流 (CT /5)	± 0.5% (0.1-1.2In) ±0.5 位
有功电能	1 类 (IEC/EN 62053-21)
无功电能	2 类 (IEC/EN 62053-23)
附加误差	
温度	0.05%/°K 每 V、A、W
绝缘电压	
额定绝缘电压 Ui	600V~
额定冲击耐压 Uimp	9.5kV
工频耐压	5.2kV
环境工作条件	
工作温度	-20 - +60°C
存储温度	-30 - +80°C
相对湿度	<80% (IEC/EN 60068-2-78)
最大污染度	2
过电压类别	3
测量类别	III
气候顺序	Z/ABDM (IEC/EN 60068-2-61)
耐冲击性	15g (IEC/EN 60068-2-27)
抗振性	0.7g (IEC/EN 60068-2-6)
连接	
端子类型	插入式 / 可拆卸
电缆截面（最小-最大）	0.2-2.5 mm² (24-12 AWG)
UL 评级 电缆截面（最小-最大）	0.75-2.5 mm² (18-12 AWG)
上紧扭矩	0.56 Nm (5 LBin)
壳体	
型号	柜面式安装
材质	聚碳酸酯

Technical characteristics

Supply	
Rated voltage Us ❶	100 - 440V~
	110 - 250V=
Operating voltage range	90 - 484V~
	93,5 - 300V=
Frequency	45 - 66Hz
Power consumption/dissipation	2W – 5VA
Immunity time for microbreakings	>= 20ms
Recommended fuses	F1A (fast)
Voltage inputs	
Maximum rated voltage Ue	600VAC L-L (346VAC L-N)
Measuring range	50…720V L-L (415VAC L-N)
Frequency range	45…65Hz
Measuring method	True RMS
Measuring input impedance	L-N - L-L > 8MΩ
Wiring mode	Single-phase, two-phase, three-phase with or without neutral or balanced three-phase system.
Recommended fuses	F1A (fast)
Current inputs	
Rated current Ie	1A~ or 5A~
Measuring range	For 5A scale: 0.025 - 6A~
	For 1A scale: 0.025 – 1.2A~
Type of input	Shunt supplied by an external current transformer (low voltage). Max. 5A
Measuring method	True RMS
Overload capacity	+20% Ie
Overload peak	50A for 1 second
Burden (per phase)	≤0.6VA
Measuring accuracy	
Measuring conditions Temperature	+23°C ±2°C
Voltage (phase to neutral)	± 0.5% (50…480V~) ±0.5 digit
Voltage (phase to phase)	± 0.5% (80…830V~) ±0.5 digit
Current (CT /5)	± 0.5% (0.1…1.2In) ±0.5 digit
Active Energy	Class 1 (IEC/EN 62053-21)
Reactive energy	Class 2 (IEC/EN 62053-23)
Additional errors	
Temperature	0,05%/°K per V, A, W
Insulation voltage	
Rated insulation voltage Ui	600V~
Rated impulse withstand voltage Uimp	9.5kV
Power frequency withstand voltage	5,2kV
Ambient operating conditions	
Operating temperature	-20 - +60°C
Storage temperature	-30 - +80°C
Relative humidity	<80% (IEC/EN 60068-2-78)
Maximum pollution degree	2
Overvoltage category	3
Measurement category	III
Climatic sequence	Z/ABDM (IEC/EN 60068-2-61)
Shock resistance	15g (IEC/EN 60068-2-27)
Vibration resistance	0.7g (IEC/EN 60068-2-6)
Connections	
Terminal type	Plug-in / removable
Cable cross section (min… max)	0.2…2.5 mm² (24-12 AWG)
UL Rating Cable cross section (min… max)	0,75…2.5 mm² (18…12 AWG)
Tightening torque	0.56 Nm (5 LBin)
Housing	
Version	Flush mount
Material	Polycarbonate

防护等级	前面板为 IP54 —端子为 IP20
重量	330g
认证及合规性	
cULus	申请中
参考标准	IEC/EN 61010-1、IEC/EN 61000-6-2 IEC/EN 61000-6-4 UL61010-1 和 CSA C22.2-N°61010-1

❶ *连接到线路的辅助电源，相电压 ≤300V*

Degree of protection	IP54 on front - IP20 terminals
Weight	330g
Certifications and compliance	
cULus	Pending
Reference standards	IEC/EN 61010-1, IEC/EN 61000-6-2 IEC/ EN 61000-6-4 UL61010-1 and CSA C22.2-N°61010-1

❶ *Auxiliary supply connected to a line with a phase-neutral voltage ≤300V*

手册修订记录

版本	日期	备注
00	18/06/2014	• 第一版
01	23/10/2014	• UL 标志更新
02	21/04/2015	• 增加了谐波含量 • 门限数量从 4 增加至 8 • 增加参数 P08.n.11 和 P08.n.12

Manual revision history

Rev	Date	Notes
00	18/06/2014	• First release
01	23/10/2014	• UL marking update
02	21/04/2015	• Added harmonic content • Limit number from 4 to 8 • Added parameters P08.n.11 and P08.n.12