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GB POWER ANALYZERS

Instruction manual

CN 电力分析仪

说明手册

DMG7000-7500-8000-9000



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.
- The manufacturer must be held responsible for electrical safety in case of improper use of the equipment.
- 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 § 6.11.3.1
- Clean the device with a soft dry cloth; do not use abrasives, liquid detergents or solvents.



ATTENTION!

- Lire attentivement le manuel avant toute utilisation et installation.
- Ces appareils doivent être installés par un personnel qualifié, conformément aux normes en vigueur en matière d'installations, afin d'éviter de causer des dommages à des personnes ou choses.
- Avant toute intervention sur l'instrument, mettre les entrées de mesure et d'alimentation hors tension et court-circuiter les transformateurs de courant.
- Le constructeur n'assume aucune responsabilité quant à la sécurité électrique en cas d'utilisation impropre du dispositif.
- Les produits décrits dans ce document sont susceptibles d'évoluer ou de subir des modifications à n'importe quel moment. Les descriptions et caractéristiques techniques du catalogue ne peuvent donc avoir aucune valeur contractuelle.
- Un interrupteur ou disjoncteur doit être inclus dans l'installation électrique du bâtiment. Celui-ci doit se trouver tout près de l'appareil et l'opérateur doit pouvoir y accéder facilement. Il doit être marqué comme le dispositif d'interruption de l'appareil: IEC/EN 61010-1 § 6.11.3.1.
- Nettoyer l'appareil avec un chiffon doux, ne pas utiliser de produits abrasifs, détergents liquides ou solvants.



ACHTUNG!

- Dieses Handbuch vor Gebrauch und Installation aufmerksam lesen.
- Zur Vermeidung von Personen- und Sachschäden dürfen diese Geräte nur von qualifiziertem Fachpersonal und unter Befolgung der einschlägigen Vorschriften installiert werden.
- Vor jedem Eingriff am Instrument die Spannungszufuhr zu den Messeingängen trennen und die Stromwandler kurzschließen.
- Bei zweckwidrigem Gebrauch der Vorrichtung übernimmt der Hersteller keine Haftung für die elektrische Sicherheit.
- Die in dieser Broschüre beschriebenen Produkte können jederzeit weiterentwickelt und geändert werden. Die im Katalog enthaltenen Beschreibungen und Daten sind daher unverbindlich und ohne Gewähr.
- In die elektrische Anlage des Gebäudes ist ein Ausschalter oder Trennschalter einzubauen. Dieser muss sich in unmittelbarer Nähe des Geräts befinden und vom Bediener leicht zugänglich sein. Er muss als Trennvorrichtung für das Gerät gekennzeichnet sein: IEC/EN 61010-1 § 6.11.3.1.
- Das Gerät mit einem weichen Tuch reinigen, keine Scheuermittel, Flüssigreiner oder Lösungsmittel verwenden.



ADVERTENCIA

- Leer atentamente el manual antes de instalar y utilizar el regulador.
- Este dispositivo debe ser instalado por personal cualificado conforme a la normativa de instalación vigente a fin de evitar daños personales o materiales.
- Antes de realizar cualquier operación en el dispositivo, desconectar la corriente de las entradas de alimentación y medida, y cortocircuitar los transformadores de corriente.
- El fabricante no se responsabilizará de la seguridad eléctrica en caso de que el dispositivo no se utilice de forma adecuada.
- Los productos descritos en este documento se pueden actualizar o modificar en cualquier momento. Por consiguiente, las descripciones y los datos técnicos aquí contenidos no tienen valor contractual.
- La instalación eléctrica del edificio debe disponer de un interruptor o disyuntor. Este debe encontrarse cerca del dispositivo, en un lugar al que el usuario pueda acceder con facilidad. Además, debe llevar el mismo marcado que el interruptor del dispositivo (IEC/EN 61010-1 § 6.11.3.1).
- Limpiar el dispositivo con un trapo suave; no utilizar productos abrasivos, detergentes líquidos ni disolventes.



UPOZORNĚNÍ

- Návod se pozorně pročtěte, než začnete regulátor instalovat a používat.
- Tato zařízení smí instalovat kvalifikovaní pracovníci v souladu s platnými předpisy a normami pro předcházení úrazů osob či poškození věcí.
- Před jakýmkoli zásahem do přístroje odpojte měřící a napájecí vstupy od napětí a zkratujte transformátory proudů.
- Výrobce nenese odpovědnost za elektrickou bezpečnost v případě nevhodného používání regulátoru.
- Výrobky popsané v tomto dokumentu mohou kdykoli projít úpravami či dalším vývojem. Popisy a údaje uvedené v katalogu nemají proto žádnou smluvní hodnotu.
- Spínač či odpojovač je nutno zabudovat do elektrického rozvodu v budově. Musejí být nainstalované v těsné blízkosti přístroje a snadno dostupné pracovníku obsluhy. Je nutno ho označit jako vypínací zařízení přístroje: IEC/EN 61010-1 § 6.11.3.1.
- Přístroj čistěte měkkou utěrkou, nepoužívejte abrazivní produkty, tekutá čisticí či rozpouštědla.



AVERTIZARE!

- Citiți cu atenție manualul înainte de instalare sau utilizare.
- Acest echipament va fi instalat de personal calificat, în conformitate cu standardele actuale, pentru a evita deteriorări sau pericolele.
- Înainte de efectuarea oricărei operațiuni de întreținere asupra dispozitivului, îndepărtați toate tensiunile de la intrările de măsurare și de alimentare și scurtcircuitați bornele de intrare CT.
- Producătorul nu poate fi considerat responsabil pentru siguranța electrică în caz de utilizare incorectă a echipamentului.
- Produsele ilustrate în prezentul sunt supuse modificărilor și schimbărilor fără notificare anterioară. Datele tehnice și descrierile din documentație sunt precise, în măsura cunoștințelor noastre, dar nu se acceptă nicio răspundere pentru erorile, omisiunile sau evenimentele neprevăzute care apar ca urmare a acestora.
- Trebuie inclus un disjuncteur în instalația electrică a clădirii. Acesta trebuie instalat aproape de echipament și într-o zonă ușor accesibilă operatorului. Acesta trebuie marcat ca fiind dispozitivul de deconectare al echipamentului: IEC/EN 61010-1 § 6.11.3.1.
- Curățați instrumentul cu un material textil moale și uscat; nu utilizați substanțe abrazive, detergenți lichizi sau solvenți.



ATTENZIONE!

- Leggere attentamente il manuale prima dell'utilizzo e l'installazione.
- Questi apparecchi devono essere installati da personale qualificato, nel rispetto delle vigenti normative impiantistiche, allo scopo di evitare danni a persone o cose.
- Prima di qualsiasi intervento sullo strumento, togliere tensione dagli ingressi di misura e di alimentazione e cortocircuitare i trasformatori di corrente.
- Il costruttore non si assume responsabilità in merito alla sicurezza elettrica in caso di utilizzo improprio del dispositivo.
- I prodotti descritti in questo documento sono suscettibili in qualsiasi momento di evoluzioni o di modifiche. Le descrizioni ed i dati a catalogo non possono pertanto avere alcun valore contrattuale.
- Un interruttore o disgiuntore va compreso nell'impianto elettrico dell'edificio. Esso deve trovarsi in stretta vicinanza dell'apparecchio ed essere facilmente raggiungibile da parte dell'operatore. Deve essere marchiato come il dispositivo di interruzione dell'apparecchio: IEC/EN 61010-1 § 6.11.3.1.
- Pulire l'apparecchio con panno morbido, non usare prodotti abrasivi, detergenti liquidi o solventi.



UWAGA!

- Przed użyciem i instalacją urządzenia należy uważnie przeczytać niniejszą instrukcję.
- W celu uniknięcia obrażeń osób lub uszkodzenia mienia tego typu urządzenia muszą być instalowane przez wykwalifikowany personel, zgodnie z obowiązującymi przepisami.
- Przed rozpoczęciem jakichkolwiek prac na urządzeniu należy odłączyć napięcie od wejść pomiarowych i zasilania oraz zewrzeć zaciski przekładnika prądowego.
- Producent nie przyjmuje na siebie odpowiedzialności za bezpieczeństwo elektryczne w przypadku niewłaściwego użytkowania urządzenia.
- Produkty opisane w niniejszym dokumencie mogą być w każdej chwili udoskonalone lub zmodyfikowane.
- Opisy oraz dane katalogowe nie mogą mieć w związku z tym żadnej wartości umownej.
- W instalacji elektrycznej budynku należy uwzględnić przełącznik lub wyłącznik automatyczny. Powinien on znajdować się w bliskim sąsiedztwie urządzenia i być łatwo osiagalny przez operatora. Musi być oznaczony jako urządzenie służące do wyłączania urządzenia: IEC/EN 61010-1 § 6.11.3.1.
- Urządzenie należy czyścić miękką szmatką, nie stosować środków ściernych, płynnych detergentów lub rozpuszczalników.



注意

- 使用前必ず取扱説明書をよく読んでください。
- 設備は合格した技術者が現行の規格に従って設置する必要があります。不適当な設置は人身や財産の危険を招きます。
- 設備のメンテナンスを行う前に、必ず測定端子と電源入力端子の電圧を短絡してCT入力端子を短絡してください。
- 製造者は、設備の誤用による電気安全の問題を責任を負いません。
- 製品の仕様やデータが変更される場合があります。変更がある場合は、必ずお知らせいたします。ただし、誤り、漏れ、またはそれらによる偶発的な事故については責任を負いません。
- 電圧降下装置には必ず遮断器を近接した場所に設置し、かつ作業員が触れやすい場所に設置してください。遮断器は設備の遮断装置としてマークする必要があります: IEC/EN 61010-1 § 6.11.3.1。
- 柔らかい布で設備を清掃してください。研磨剤、洗剤や溶剤は使用しないでください。



ПРЕДУПРЕЖДЕНИЕ!

- Прежде чем приступить к монтажу или эксплуатации устройства, внимательно ознакомьтесь с содержанием настоящего руководства.
- Во избежание травм или материального ущерба монтаж должен осуществляться только квалифицированным персоналом в соответствии с действующими нормативами.
- Перед проведением любых работ по техническому обслуживанию устройства необходимо обесточить все измерительные и питающие входные контакты, а также замкнуть накоротко входные контакты трансформатора тока (ТТ).
- Производитель не несет ответственность за обеспечение электробезопасности в случае ненадлежащего использования устройства.
- Изделия, описанные в настоящем документе, в любой момент могут подвергнуться изменениям или усовершенствованиям. Поэтому каталожные данные и описания не могут рассматриваться как действительные с точки зрения контрактов.
- Электрическая сеть здания должна быть оснащена автоматическим выключателем, который должен быть расположен вблизи оборудования в пределах доступа оператора. Автоматический выключатель должен быть маркирован как отключающее устройство оборудования: IEC/EN 61010-1 § 6.11.3.1.
- Очистку устройства производить с помощью мягкой сухой ткани, без применения абразивных материалов, жидких моющих средств или растворителей.



DİKKAT!

- Montaj ve kullanımdan önce bu el kitabını dikkatlice okuyunuz.
- Bu aparatlar kişilere veya nesnelere zarar verme ihtimaline karşı yürürlükte olan sistem kurma normlarına göre kalifiye personel tarafından monte edilmelidir.
- Aparatı (cihaz) herhangi bir müdahalede bulunmadan önce ölçüm girişlerindeki gerilimi kesip akım transformatorlerinede kısa devre yaptırınız.
- Üretici aparatın hatalı kullanımından kaynaklanan elektriksel güvenliğe ait sorumluluk kabul etmez.
- Bu dokümanda tarif edilen ürünler her an evrimlere veya değişimlere açıktır. Bu sebeple katalogdaki tarif ve değerler herhangi bir bağlayıcı değeri haiz değildir.
- Binanın elektrik sisteminde bir anahtar veya şalter bulunmalıdır. Bu anahtar veya şalter operatörün kolaylıkla ulaşabileceği yakın bir yerde olmalıdır. Aparatı (cihaz) devreden çıkartma görevi yapan bu anahtar veya şalterin markası: IEC/EN 61010-1 § 6.11.3.1.
- Aparatı (cihaz) sıvı deterjan veya solvent kullanarak yumuşak bir bez ile siliniz aşındırıcı temizlik ürünleri kullanmayınız.



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INTRODUCTION

The DMG... series power analyzers with widescreen color display have been designed to offer a user-friendly interface. The flush mount execution requires the standard 92x92mm cut-out. Parameter programming can be done via the front panel, smartphone with NFC technology or via infrared optical interface which let the user access by USB and Xpress software or Wi-Fi and SAM1 app.

The advanced functions of the analyzers can be further enriched thanks to the expandability with modules of the EXP series... Depending on the model chosen, isolated RS485, ethernet or both communication ports are available, all equipped with modbus communication protocol. In versions with ethernet interface, a built-in web server offers the ability to remotely access the analyzer directly to read the measurements or do settings, including those relevant to the data log to collect historical trends of measurements selected by the user.

These analyzers can be used as stand-alone devices or as concentrators for the EASY BRANCH system.

DESCRIPTION

- Three-phase digital power analyzer.
- Panel mounting, standard 92x92mm cut-out.
- 118x96mm front with widescreen color LCD display.
- Versions:
 - DMG7000: basic version;
 - DMG7500: built-in RS485 isolated serial port;
 - DMG8000: built-in isolated ethernet port and data log for data collection;
 - DMG9000: built-in RS485 and ethernet isolated ports, data log for data collection and utility quality statistics according to EN50160, measurement of neutral-earth voltage and neutral current with dedicated CT.
- Expandable with 3 modules of the EXP series ...
- Compatible with EASY BRANCH system (DMG7000 excluded).
- Auxiliary power supply 100-240VAC.
- 4 navigation keys for functions and settings.
- 3 programmable front LEDs.
- True RMS measurements (TRMS).
- Programming interfaces:
 - display and keyboard with menu in 10 languages (English, Italian, Spanish, French, German, Portuguese, Czech, Polish, Russian, Chinese);
 - NFC access to be used with the Lovato NFC app available for Android and iOS devices;
 - optical port at back of the power analyzer compatible with CX01 (USB) and CX02 (Wi-Fi) connection devices to be used with Xpress software or SAM1 app available for Android and iOS devices.
- Built-in web server (DMG8000 and DMG9000).
- Settings protection with multilevel password.
- Back-up copy of original settings.

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简介

DMG... 系列电力分析仪配备宽屏彩色显示屏，其设计旨在提供用户友好的界面。嵌入式安装需要标准的 92 x 92 mm 开孔。参数编程可通过前面板、采用 NFC 技术的智能手机或通过红外光学接口完成，用户通过 USB 和 Xpress 软件或 Wi-Fi 和 SAM1 应用即可访问。

EXP... 系列模块的可扩展性进一步丰富了分析仪的高级功能。根据所选型号，提供隔离式 RS485、以太网或两种通讯端口兼有，均采用 Modbus 通讯协议。在带有以太网接口的型号中，通过内置的网络服务器可直接远程访问分析仪，以读取测量值或进行设置，包括与数据日志有关的设置，便于收集用户选择的测量值的历史趋势。这些分析仪既可用作独立的设备，也可作为易回路系统的集中器。

描述

- 三相数字电力分析仪。
- 面板安装，标准的 92 x 92 mm 开孔。
- 118 x 96 mm 前置宽屏彩色 LCD 显示屏。
- 型号：
 - DMG7000: 基本型号；
 - DMG7500: 内置 RS485 隔离式串行端口；
 - DMG8000: 内置隔离式以太网端口和用于收集数据的数据日志；
 - DMG9000: 内置 RS485 和以太网隔离式端口、用于收集数据的数据日志和符合 EN50160 标准的市电质量统计功能，使用专用 CT 测量中性线接地电压和中性线电流。
- 可通过 EXP... 系列的 3 个模块进行扩展。
- 支持易回路系统 (DMG7000 除外)。
- 辅助电源 100-240VAC。
- 4 个功能和设置导航键。
- 3 个可编程前置 LED。
- 真均方根值测量 (TRMS)。
- 编程接口：
 - 提供 10 种语言菜单的显示屏和键盘 (英语、意大利语、西班牙语、法语、德语、葡萄牙语、捷克语、波兰语、俄语、中文)；
 - NFC 功能可与 Android 和 iOS 设备上的 Lovato NFC 应用配合使用；
 - 电力分析仪背面的光学端口与 CX01 (USB) 和 CX02 (Wi-Fi) 连接设备兼容，可与 Xpress 软件或 Android 和 iOS 设备上的 SAM1 应用配合使用。
- 内置网络服务器 (DMG8000 和 DMG9000)。
- 使用多级密码保护设置。
- 原始设置备份。



The front LEDs are programmable and let the user know the status of the power analyzer at any time: programmed user alarms, status of digital inputs or outputs, emission of pulses indicating energy consumption, communication in progress. Refer to menu M12 for their control.

- LED1: green
- LED2: yellow
- LED3: red

MEASUREMENT DISPLAY

The ▲ and ▼ keys scrolls through the pages to view the main measurements. The selected page can be recognized by the title bar. The page list bar on the left helps navigate through them.

Some of the measurements may not be displayed depending on the setup and connection of the device.

In order to access further detailed measurements, use the = key and select the desired measurement menu.

The 0 key let the user access to sub-pages.

The sub-page currently displayed is indicated next to the numerical values and at the bottom left of display by one of the following items:

- INST: present value of the measurement.
- MAX, MIN: maximum and minimum values measured for the relevant measurement. They are stored and maintained even in the absence of power and can be reset using the appropriate command (see commands menu).
- AVG: value of the measure averaged over time. The measurement can be seen with slow variations (see Integration menu).
- MD: maximum integrated value. Maximum value of the average value (max demand). It can be reset using the specific command (see commands menu).

前置 LED 可进行编程，让用户随时了解电力分析仪的状态：程序化用户报警、数字输入或输出状态、指示能耗的脉冲发射、通讯进度。请参见菜单 M12 了解各自的控制功能。

- LED1: 绿色
- LED2: 黄色
- LED3: 红色

测量显示

▲ 和 ▼ 键用于滚动浏览页面，以查看主要测量值。通过标题栏可识别所选页面。左侧的页面列表栏用于在其中进行导航。

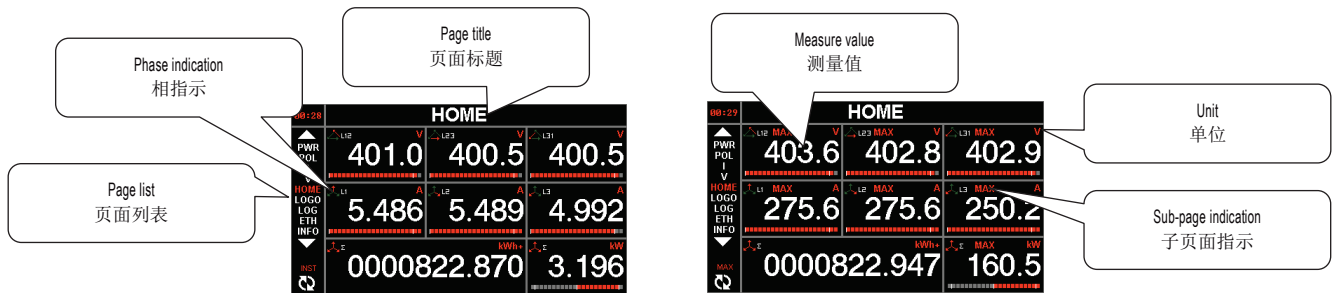
根据设备的设置和连接情况，某些测量值可能不会显示。

如需访问更多详细的测量值，请使用 = 键，并选择所需的测量菜单。





用户通过 0 键可访问子页面。

当前显示的子页面在数值 旁边指示，显示屏的左下角还会显示以下其中一项：

- INST: 测量的当前值。
- MAX, MIN: 相关测量的最大值和最小值。即使在未通电的情况下，也会存储和维护这些值，并且可使用相应的命令进行复位（参见命令菜单）。
- AVG: 一段时间内的平均测量值。该测量值可见缓慢变化（参见积分菜单）。
- MD: 最大积分值。最大平均值（最大需量）。该值可使用专用命令进行复位（参见命令菜单）。

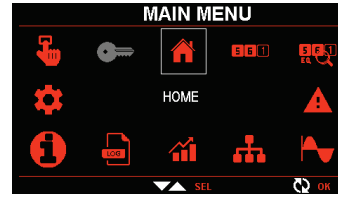
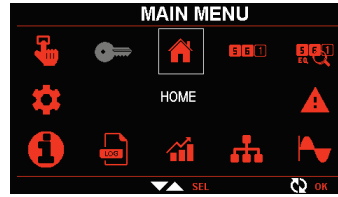


▲▼	TITLE 标题	Measure 测量值 1	Measure 测量值 2	Measure 测量值 3	Measure 测量值 4	Measure 测量值 5	Measure 测量值 6	Measure 测量值 7	Measure 测量值 8	Measure 测量值 9	Measure 测量值 10
HOME	Customizable (P02.10) 可自定义 (P02.10)	V L1-L2	V L2-L3	V L3-L1	IL1	IL2	IL3	KWh+TOT	KW TOT		
V	VOLTAGE 电压	V L1-L2	V L2-L3	V L3-L1	V L1-N	V L2-N	V L3-N	V L-L EQV	V L-N EQV	Hz	
I	CURRENT 电流	IL1	IL2	IL3	THD I1	THD I2	THD I3	IN	ASY I	Hz	
PWR	POWER 功率	P TOT	Q TOT	S TOT	PF TOT	PF AVG (Wh/VAh)	tan AVG (Wh/varh)				
P	ACTIVE POWER 有功功率	PL1	PL2	PL3	PF L1	PF L2	PF L3	TREND PTOT	P TOT		
Q	REACTIVE POWER 无功功率	QL1	QL2	QL3	PF L1	PF L2	PF L3	TREND QTOT	Q TOT		
S	APPARENT POWER 视在功率	SL1	SL2	SL3	PF L1	PF L2	PF L3	TREND STOT	S TOT		
PF	POWER FACTOR 功率因数	PF L1	PF L2	PF L3	cosφ L1	cosφ L2	cosφ L3	φ L1	φ L2	φ L3	

ENE	ENERGY 电能	TOT SYS (L1+L2+L3)					PAR SYS (L1+L2+L3)				
		kWh+	kWh-	kvarh+	kvarh-	kVAh	kWh+	kWh-	kvarh+	kvarh-	kVAh
☐		TOT SYS (L1+L2+L3)					TOT L1				
		kWh+	kWh-	kvarh+	kvarh-	kVAh	kWh+	kWh-	kvarh+	kvarh-	kVAh
☐		TOT SYS (L1+L2+L3)					TOT L2				
		kWh+	kWh-	kvarh+	kvarh-	kVAh	kWh+	kWh-	kvarh+	kvarh-	kVAh
☐		TOT SYS (L1+L2+L3)					TOT L3				
		kWh+	kWh-	kvarh+	kvarh-	kVAh	kWh+	kWh-	kvarh+	kvarh-	kVAh
☐		PAR SYS (L1+L2+L3)					PAR L1				
		kWh+	kWh-	kvarh+	kvarh-	kVAh	kWh+	kWh-	kvarh+	kvarh-	kVAh
☐		PAR SYS (L1+L2+L3)					PAR L2				
		kWh+	kWh-	kvarh+	kvarh-	kVAh	kWh+	kWh-	kvarh+	kvarh-	kVAh
☐		PAR SYS (L1+L2+L3)					PAR L3				
		kWh+	kWh-	kvarh+	kvarh-	kVAh	kWh+	kWh-	kvarh+	kvarh-	kVAh
T1	TARIFF T1 (P02.11 = ON) 费率 T1 (P02.11 = ON)	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L1	kWh- L1	kvarh+ L1	kvarh- L1	kVAh L1
	☐	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L2	kWh- L2	kvarh+ L2	kvarh- L2	kVAh L2
	☐	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L3	kWh- L3	kvarh+ L3	kvarh- L3	kVAh L3
T2	TARIFF T2 (P02.11 = ON) 费率 T2 (P02.11 = ON)	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L1	kWh- L1	kvarh+ L1	kvarh- L1	kVAh L1
	☐	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L2	kWh- L2	kvarh+ L2	kvarh- L2	kVAh L2
	☐	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L3	kWh- L3	kvarh+ L3	kvarh- L3	kVAh L3
T3	TARIFF T3 (P02.11 = ON) 费率 T3 (P02.11 = ON)	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L1	kWh- L1	kvarh+ L1	kvarh- L1	kVAh L1
	☐	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L2	kWh- L2	kvarh+ L2	kvarh- L2	kVAh L2
	☐	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L3	kWh- L3	kvarh+ L3	kvarh- L3	kVAh L3
T4	TARIFF T4 (P02.11 = ON) 费率 T4 (P02.11 = ON)	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L1	kWh- L1	kvarh+ L1	kvarh- L1	kVAh L1
	☐	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L2	kWh- L2	kvarh+ L2	kvarh- L2	kVAh L2
	☐	kWh+ SYS	kWh- SYS	kvarh+ SYS	kvarh- SYS	kVAh SYS	kWh+ L3	kWh- L3	kvarh+ L3	kvarh- L3	kVAh L3
POL	POLAR DIAGRAM 相位图	V L1-N I L1 ∠V-I1 cosφ V-I1	V L2-N I L2 ∠V-I2 cosφ V-I2	V L3-N I L3 ∠V-I3 cosφ V-I3	∠V L1-L2 ∠V L2-L3 ∠V L3-L2	∠I L1-L2 ∠I L2-L3 ∠I L3-L2					
ALA	ALARMS 报警	 N. active alarms 活动的报警数量	 N. active warnings 活动的警告数量	 N. stored alarms 存储的报警数量	 N. stored warnings 存储的警告数量	ALA 1	...	ALA 40			
THD	TOTAL HARMONIC DIST 总谐波失真	THD V L1	THD V L2	THD V L3	THD I1	THD I2	THD I3	THD V L4	THD In		
HCNT	HOUR COUNTERS (P05.01) 计时器 (P05.01)	HCNT 1	HCNT 2	HCNT 3	HCNT 4						
EXP	EXPANSION MODULES 扩展模块	DMG	EXP 1	EXP 2	EXP 3						
AIN	ANALOG INPUTS (P15.n.01) 模拟输入 (P15.n.01)	AIN 1	...	AIN 6							
LIM	LIMIT THRESHOLDS (P08.n.01) 门限 (P08.n.01)	LIM 1	...	LIM 40							
IO	INPUTS/OUTPUTS STATUS (with expansion module installed) 输入/输出状态 (安装了扩展模块)	INP 1	...	INP 12	OUT 1	...	OUT 12				
INP	INPUTS DETAILS (with expansion module installed) 输入详情 (安装了扩展模块)	INP 1	...	INP 12							
OUT	OUTPUTS DETAILS (with expansion module installed) 输出详情 (安装了扩展模块)	OUT 1	...	OUT 12							
CNT	COUNTERS (P10.n.01) 计数器 (P10.n.01)	CNT 1	...	CNT 8							
RTC	DATE / TIME 日期时间										
INFO	SYSTEM INFO 系统信息	Model 型号	SW rev.	HW rev.	PAR. Rev.	Serial number 序列号	Backup status 备份状态	PLC status PLC 状态	NFC status NFC 状态		

	☰	Checksum	SW date								
ETH	以太网 (DMG8000-9000)										
LOG	数据日志 (DMG8000-9000)										
LOGO											

Further pages are available by accessing the menu with ☰ key.
使用 ☰ 键访问菜单可查看其他页面。



	TITLE 标题	Measure 测量值 1	Measure 测量值 2	Measure 测量值 3	Measure 测量值 4	Measure 测量值 5
	WAVEFORM VLN 波形相电压 VLN	V L1-N	Vp L1-N (peak 峰值)	THD V L1	C V L1 (crest factor 峰值因数)	
☰		V L2-N	Vp L2-N (peak 峰值)	THD V L2	C V L2 (crest factor 峰值因数)	
☰		V L3-N	Vp L3-N (peak 峰值)	THD V L3	C V L3 (crest factor 峰值因数)	
☰		V4-N	V4p-N (peak 峰值)	THD V4	C V4 (crest factor 峰值因数)	
▼	HARMONICS VLN 谐波相电压 VLN	THD V L1	THD V L2	THD V L3	H 2...63	
▼	WAVEFORM VLL 波形线电压 VLL	V L1-L2	Vp L1-L2 (peak 峰值)	THD V L1-L2	C V L1-L2 (crest factor 峰值因数)	
☰		V L2-L3	Vp L2-L3 (peak 峰值)	THD V L2-L3	C V L2-L3 (crest factor 峰值因数)	
☰		V L3-L1	Vp L3-L1 (peak 峰值)	THD V L3-L1	C V L3-L1 (crest factor 峰值因数)	
▼	HARMONICS VLL 谐波线电压 VLL	THD V L1-L2	THD V L2-L3	THD V L3-L1	H 2...63	
▼	WAVEFORM I 波形电流 I	I1	Ip 1 (peak 峰值)	THD I1	C I1 (crest factor 峰值因数)	K I1 (K-factor K-因子)
☰		I2	Ip 2 (peak 峰值)	THD I2	C I2 (crest factor 峰值因数)	K I2 (K-factor K-因子)
☰		I3	Ip 3 (peak 峰值)	THD I3	C I3 (crest factor 峰值因数)	K I3 (K-factor K-因子)
☰		I4	Ip 4 (peak 峰值)	THD I4	C I4 (crest factor 峰值因数)	K I4 (K-factor K-因子)
▼	HARMONICS I 谐波 I	THD I1	THD I2	THD I3	H 2...63	
	TREND 趋势	TRD 01...40				
	EVENT LOG 事件日志	EV 1...128				
	ENERGY QUALITY 电能质量	%WEEK	%YEAR	COUNTERS	WAVEFORMS (10)	

WAVEFORM AND HARMONICS PAGES

DMGs provide the harmonic analysis up to the 63rd order (7th order if the operating frequency is 400Hz) of the phase-to-phase voltages, phase-to-neutral voltages, phase and neutral currents.

- For each of these measurements, a display page graphically represents the harmonic content (spectrum) through a bar graph.
- Every column is related to one harmonic order (even and odd). The first column shows the total harmonic distortion (THD).
- Every bar is divided into three parts, one each phase L1, L2, L3.
- The value of the harmonic content is expressed as a percentage with respect to the fundamental (system frequency).
- It is possible to show the harmonic content in numeric format, selecting the required order through the arrow keys after ☰.
- The waveform pages show 2 periods of the selected electrical quantity and phase.

TREND PAGES

The trend graph pages show the changes in the time domain of the selected measurements among the following:

- average equivalent phase-to-phase or phase voltages;
- current;
- average total active power;
- average total reactive power;
- average total apparent power.

It is possible to see on the graph the history of the last 384 values of the integrated measurement, each correspondent to a integration time interval. With 15 minutes interval, the last 4 days samples are displayed. The data are reset when DMG reboots.

EVENT LOG

The list of events can be useful to the user in order to detect anomalies or keep track of the plant behaviour. The memory can store the last 128 events, afterwards the oldest events are overwritten by the new ones (FIFO logic).

波形和谐波页面

DMG 提供线电压、相电压、相电流和中性线电流的谐波分析，最高可达 63 次（如果工作频率为 400Hz，则为 7 次）。

- 对于每个测量，均有一个显示页面以条形图的方式显示谐波含量（频谱）。
- 每一列与一个谐波次数（偶数或奇数）相关。第一列显示总谐波失真（THD）。
- 每一列分为三个部分，分别对应相位 L1、L2、L3。
- 谐波含量的值使用相对于基波（系统频率）的百分比表示。
- 通过使用 ☰ 后面的箭头键选择所需次数，可以数字格式显示谐波含量。
- 波形页面显示 2 个时间段的所选电量和相位。

趋势页面

趋势图页面显示以下所选测量值在时域中的变化：

- 平均等效线电压或相电压；
- 电流；
- 平均总有功功率；
- 平均总无功功率；
- 平均总视在功率；

在图上可以看到最近 384 个积分测量值的历史，每个值对应一个积分时间间隔。以 15 分钟的间隔，显示最近 4 天的采样情况。DMG 重启后，数据将复位。

事件日志

用户可使用事件列表来检测异常情况或跟踪工厂行为。存储器可存储最近 128 个事件，之后最旧的事件会被新的事件覆盖（先进先出逻辑）。

Each event is stored with
 - a sequential number;
 - a reference code;
 - time stamp;
 - description.



每个事件存储有
 - 序号;
 - 参考码;
 - 时间戳;
 - 描述;



EXPANDABILITY

DMGs are equipped with 3 slots to add the modules of the EXP... series up to a maximum of 3 modules. Thanks to the expansion modules, additional functionalities can be got for the power analyzer. Detailed information about the expansion modules can be found at www.lovatoelectric.com web site by downloading the dedicated catalogue section.

The modules are divided into the following categories:

- communication modules;
- digital I/O modules;
- analog I/O modules.

To insert an expansion module:

- disconnect the power supply of DMG;
- remove the terminal cover and the removable 9-pole terminal block;
- remove one of the protective covers of the expansion slots;
- insert the upper hook of the module into the appropriate hole;
- rotate the module downwards inserting the connector on the bus;
- press until the clip on the underside of the module snaps into place;
- re-install the terminal block and the terminal cover.

The order of insertion of the modules is free.

- When EXP... modules are installed on DMG series power analyzers, the installation of the sealable terminal covers supplied is mandatory.
- When a DMG is powered on, it automatically recognizes the EXP modules connected to it. If the system configuration is different from the last one detected (at least one module has been added or removed), the base unit asks the user for confirming the new configuration. In case of confirmation, the new configuration is saved and becomes effective, otherwise the discrepancy will be signaled at each power up.
- The current system configuration is displayed on the appropriate display page (expansion modules), where you can see the number, type and status of the connected modules (the numbering of the I/O and COM ports is listed under each module).

COMMUNICATION CHANNELS

The DMGs are equipped with communication capabilities thanks to the integrated ports and EXP expansion modules that can be added on the back, for a maximum of 3 totally independent ports, both from the hardware and protocol point of view. The communication ports are named COMn and can be set with menu M07.

The communication ports can work independently, or it is possible to activate the gateway function between two of them, for example to make a connection bridge between the ethernet port and the RS485 port of a DMG to which other instruments equipped with RS485 serial port.

MODEL	BUILT-IN COMMUNICATION PORTS
DMG7000	-
DMG7500	RS485 (COM1)
DMG8000	Ethernet (COM1)
DMG9000	RS485 (COM1) Ethernet (COM2)

可扩展性

DMG 配备 3 个插槽，可添加最多 3 个 EXP... 系列模块。得益于扩展模块，电力分析仪可获得额外的功能。有关扩展模块的详细信息可在 www.lovatoelectric.com 网站下载的专用目录部分找到。

这些模块分为以下几类：

- 通讯模块；
- 数字 I/O 模块；
- 模拟 I/O 模块。

若要插入扩展模块：

- 断开 DMG 的电源；
- 拆下端子盖和可拆卸的 9 芯接线端子；
- 拆下扩展插槽上的一个防护盖；
- 将模块上部的卡钩插入相应的孔中；
- 向下转动模块，将接头插入总线；
- 按压模块，直至模块下侧的线夹卡入到位；
- 装回接线端子和端子盖。

模块的插入顺序不受限制。

- 将 EXP... 模块安装到 DMG 系列电力分析仪上时，必须安装随附的密封端子盖。
- 通电后，DMG 会自动识别与之相连的 EXP 模块。如果系统配置不同于检测到的上次配置（至少添加或移除了一个模块），主体设备会要求用户确认新配置。确认后，新配置将保存并立即生效，否则每次通电时都将发送差异信号。
- 当前系统配置显示在相应的显示页面（扩展模块），您在此可以看到已连接模块的数量、类型和状态（在每个模块下方列出 I/O 和 COM 端口的编号）。

通讯信道

DMG 配有通讯功能，这得益于集成端口以及可在背面添加的 EXP 扩展模块，从硬件和协议的角度来看，可添加最多 3 个完全独立的端口。通讯端口被命名为 COMn，并可通过菜单 M07 进行设置。

通讯端口可独立工作，也可在其中两个端口之间激活网关功能，例如在 DMG 的以太网端口和 RS485 端口之间建立一个连接桥，与其他配备 RS485 串行端口的仪器连接。

型号	内置通讯端口
DMG7000	-
DMG7500	RS485 (COM1)
DMG8000	以太网 (COM1)
DMG9000	RS485 (COM1) 以太网 (COM2)

DIGITAL INPUTS AND OUTPUTS, INTERNAL VARIABLES, COUNTERS, ANALOG INPUTS

The digital inputs and outputs provided by the expansion modules are associated with the INPx and OUTx variables, where x is the numbering which depends on the position of the modules in the expansion slots. The assignments are indicated on the "Expansion Modules" page. A maximum of 12 inputs and 12 outputs can be installed, programmable through menus M13 and M14. The same happens for the analog inputs and outputs, associated with the AINx and AOux variables, for a maximum of 6 inputs and 6 outputs that can be programmed through menus M15 and M16.

There are also internal variables that can be combined with each other and associated with the outputs. To program them, refer to the corresponding item in the setting manual.

VARIABLE	SETUP MENU	NUMBER	DESCRIPTION
INPx (bit)	M13	12	Digital inputs associated with EXP... expansion modules.
OUTx (bit)	M14	12	Digital outputs associated with EXP... expansion modules.
AINx (num)	M15	6	Analog inputs associated with EXP... expansion modules.
AOux (num)	M16	6	Analog outputs associated with EXP... expansion modules.
LIMx (bit)	M08	40	Limit thresholds. They are activated when a reference measurement goes over the programmed thresholds. There are two thresholds (lower and upper) whose use varies according to the activated function: MIN: the LIMx variable is activated if the measurement is < the lower threshold and is deactivated when it is > the upper threshold (hysteresis). MAX: the LIMx variable is activated if the measurement is > of the upper threshold and is deactivated when it is < of the lower threshold (hysteresis). MIN + MAX: the LIMx variable is activated if the measurement is < of the lower threshold or > of the upper threshold and is disabled otherwise.
PLCx (bit)	-	40	Output variables of the PLC logic.
REMX (bit)	-	40	Variable which can be remotely controlled by a software.
ALAx (bit)	M09	40	Alarm status.
PULx (bit)	M11	5	Pulse output associated with the energy consumption.
CNTx (num)	M10	8	Counter.

数字输入和输出、内部变量、计数器、模拟输入

扩展模块提供的数字输入和输出与 INPx 和 OUTx 变量相关联，其中 x 为编号，具体取决于模块在扩展插槽中的位置。相关分配情况在“扩展模块”页面上显示。最多可装 12 个输入和 12 个输出，并可通过菜单 M13 和 M14 进行编程。与 AINx 和 AOux 变相关联的模拟输入和输出也是如此，最多可安装 6 个输入和 6 个输出，并可通过菜单 M15 和 M16 进行编程。

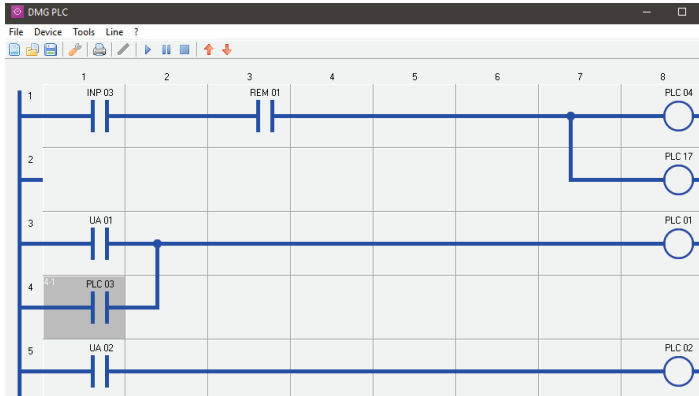
有一些内部变量，可相互结合并与输出相关联。若要对它们进行编程，请参见设置册中的相应项目。

变量	设置菜单	数量	描述
INPx (位)	M13	12	与 EXP... 扩展模块相关联的数字输入。
OUTx (位)	M14	12	与 EXP... 扩展模块相关联的数字输出。
AINx (个)	M15	6	与 EXP... 扩展模块相关联的模拟输入。
AOux (个)	M16	6	与 EXP... 扩展模块相关联的模拟输出。
LIMx (位)	M08	40	门限。在参考测量值超过编程阈值时被激活。有两个阈值（下限和上限），其用途根据激活的功能而异。 MIN: LIMx 变量在测量值 < 下限时被激活，在测量值 > 上限（滞后）时被停用。 MAX: LIMx 变量在测量值 > 上限时被激活，在测量值 < 下限（滞后）时被停用。 MIN + MAX: LIMx 变量在测量值 < 下限或 > 上限被激活，否则被禁用。
PLCx (位)	-	40	PLC 逻辑的输出变量。
REMX (位)	-	40	可通过软件远程控制的变量。
ALAx (位)	M09	40	报警状态。

TIMx (bit)	M18	8	Indication of the expiration of the timers.
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PLC LOGIC

Thanks to the integrated PLC logic, the power analyzers can perform simple automations related to timers and alarm conditions and digital inputs. Programming with "contacts" (Ladder) is simple and intuitive and done through Xpress configuration software. Up to 50 lines and 40 controllable PLC variables can be managed. The software let the user monitor in real time the behavior of the logic which has been set.

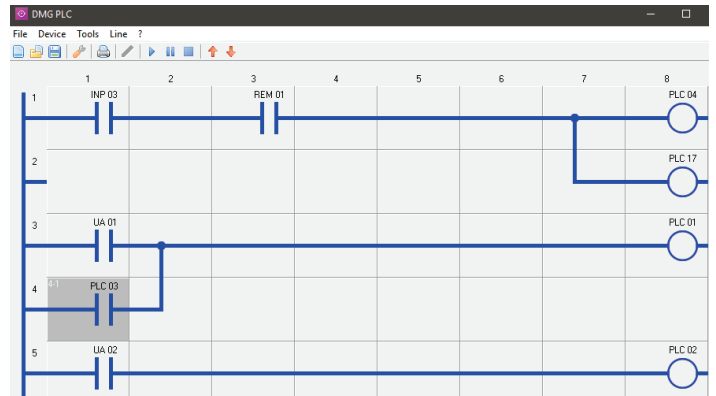


PULx (位)	M11	5	与能耗相关联的脉冲输出。
CNTx (个)	M10	8	计数器。
TIMx (位)	M18	8	指示定时器到期。

PLC 逻辑

由于集成了 PLC 逻辑，电力分析仪可执行与定时器和报警条件以及数字输入有关的简单自动化。使用“触点”（梯形图）进行编程既简单又直观，通过 Xpress 配置软件即可完成。

可管理多达 50 行和 40 个可控的 PLC 变量。用户通过该软件可实时监测已设定的逻辑行为。



EASY BRANCH SYSTEM (DMG7500 - DMG8000 - DMG9000)

In case it is necessary to monitor the parameters of several loads inside an electrical panel, the EASY BRANCH multi-circuit measuring system is a more efficient and simple alternative to install compared to the traditional solution which provides an independent instrument for each measuring point. The switchboards in shopping centers or in the departments of a production site represent ideal applications where to install the EASY BRANCH system by LOVATO Electric.

Benefits:

- reduction of wiring times;
- decrease in the possibility of wiring errors;
- automatic parameter settings.

The system is compatible with DMG7500, DMG8000 and DMG9000 models: they measure the electrical voltage in the switchboard and the incoming current and make the total measurements upstream of the distribution and the measurements of each individual monitored measuring point available on its display.

易回路系统 (DMG7500 - DMG8000 - DMG9000)

如果需要监测配电板内几个负载的参数，易回路多电路测量系统比传统解决方案更加有效且易于安装，可为每个测量点提供独立的仪器。购物中心或生产现场各部门的配电盘是安装洛瓦托电气易回路系统的理想应用。

优势:

- 接线时间更少;
- 接线出错的可能性更低;
- 自动参数设置。

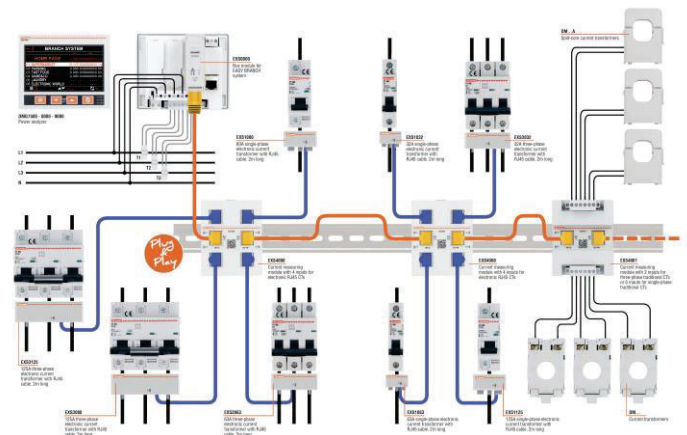
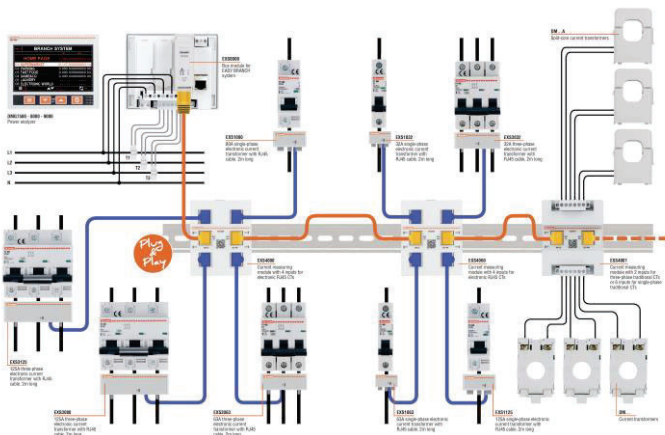
该系统支持 DMG7500、DMG8000 和 DMG9000 型号：它们可测量配电板电压和输入电流，并显示配电源上游的总测量值和每个单独监测的测量点的测量值。

BRANCH SYSTEM			
		KW	kWh+
SHOPPING MALL		2.926	000000017.57
01	SHOE STORE	1.352	000000008.26
02	CLOTHING SHOP	0.416	000000002.54
03	JEWELLER	0.351	000000002.14
04	FOOD MARKET	0.349	000000002.13
05	FAST FOOD	0.443	000000002.71
06	empty	0.000	000000000.00

BRANCH SYSTEM			
		KW	kWh+
SHOPPING MALL		2.926	000000017.57
01	SHOE STORE	1.352	000000008.26
02	CLOTHING SHOP	0.416	000000002.54
03	JEWELLER	0.351	000000002.14
04	FOOD MARKET	0.349	000000002.13
05	FAST FOOD	0.443	000000002.71
06	empty	0.000	000000000.00

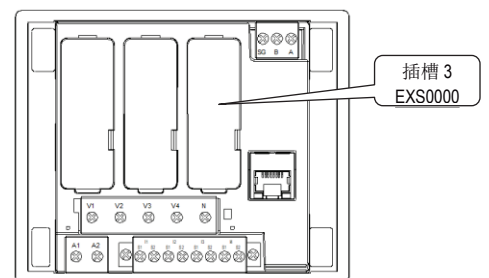
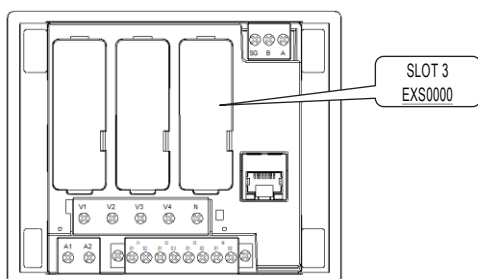
The electrical quantities can also be consulted via the built-in communication ports (RS485 or Ethernet) and through the web server (DMG8000 and DMG9000).

还可通过内置的通讯端口 (RS485 或以太网) 和网络服务器 (DMG8000 和 DMG9000) 查询电量。



In order to activate the EASY BRANCH function, the EXS0000 module must be installed in slot 3 (mandatory):

要激活易回路功能，EXS0000 模块必须安装在插槽 3 中 (强制)：



In order to use the EASY BRANCH system, refer to M20 menu and to the EXS4000, EXS4001, EXS1... and EXS3... product manuals.

WEB SERVER (DMG8000-9000)

The models with integrated Ethernet port DMG8000 and DMG9000 also include a web server which lets the users access the information in the power analyzer simply by opening a browser on their computer. The device password must be entered to access after the connection. It is possible to:

- view tables with all available measurements and graphs;
- set all parameters with menus similar to those available on the front panel; the built-in web-server also helps to set the parameters of the EASY BRANCH multi-circuit measurement system, such as the descriptions of the individual measurement points;
- manage the built-in memory for archiving historical data: selection of measurements, setting of the sampling frequency, download of .CSV files with the acquired data (Access available after entering the web setup password set in P03.05).

要使用易回路系统，请参见 M20 菜单以及 EXS4000、EXS4001、EXS1... 和 EXS3... 产品手册。

网络服务器 (DMG8000-9000)

带有集成以太网端口的型号 DMG8000 和 DMG9000 还包括一个网络服务器，用户只需在计算机上打开一个浏览器即可访问电力分析仪中的信息。连接后必须输入设备密码才能访问。用户可以：

- 查看包含所有可用测量值和图形的表格；
- 通过类似于前面板上提供的菜单设置所有参数；通过内置的网络服务器还可设置易回路多电路测量系统的参数，例如各个测量点的描述。
- 管理用于存档历史数据的内置存储器：选择测量值、设置采样频率、下载包含所获数据的 .CSV 文件（输入在 P03.05 中设定的网络设置密码后方可访问）。



- Home
- Measures
- Energy
- Polar Diagram
- Graph
- Thd
- Status
- Setup
- Datalog

Measure

	L1	L2	L3	TOT
V	229.6 V	229.7 V	229.6 V	229.6 V
A	7.984 A	8.016 A	7.978 A	7.988 A
P	1.787 kW	1.765 kW	1.753 kW	5.276 kW
Q	522.6 var	528.0 var	521.6 var	1.578 kvar
S	1.832 kVA	1.840 kVA	1.832 kVA	5.505 kVA
PF	0.958 PF	0.959 PF	0.957 PF	0.958 PF
THD VLN	0.0 V/THD	0.0 V/THD	0.0 V/THD	---
THD I	1.0 V/THD	1.0 V/THD	1.0 V/THD	---
THD VLL	0.0 V/THD	0.0 V/THD	0.0 V/THD	---

Tables of measures
测量值表

Energy

	L1	L2	L3	SUM
TOT kWh	000000013.006	000000013.106	000000012.991	000000039.104
kWh	000000000.006	000000000.000	000000000.000	000000000.006
kvarh	000000013.278	000000013.243	000000013.498	000000040.020
kvarh	000000000.003	000000000.000	000000000.000	000000000.003
kWh	000000035.717	000000035.784	000000035.775	000000107.276

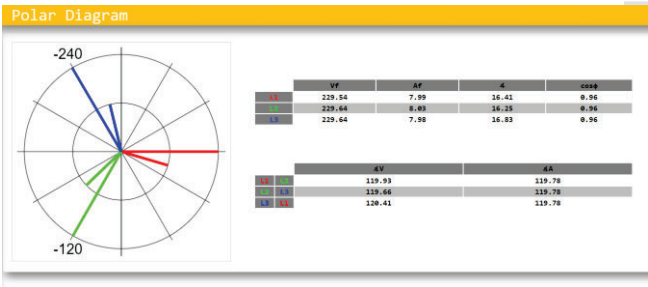
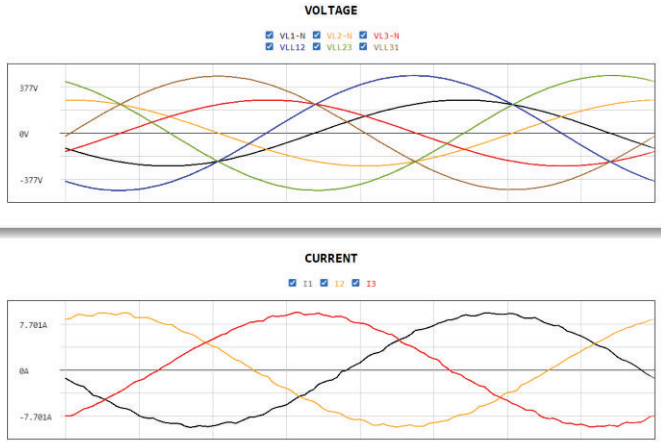
Branch

		HOME	5.276 kW	000000009.457
1	SUP LN	FAST FOOD	2.448 kW	000000044.511
2	L1	SHOE STORE	755.5 W	000000014.854
3	L2	CLOTHING SHOP	624.7 W	000000012.599
4	L3	JEWELLES	613.5 W	000000012.195
5	SUP LN	FOOD MARKET	789.2 W	000000016.008
6	SUP LN	EMPTY	0.0 W	000000000.000

Name of branch points setup
易回路支路设置的名称

Graph

Waveform charts
波形图表



Polar diagram
相位图



- Home
- Measures
- Energy
- Polar Diagram
- Graph
- Thd
- Status
- Setup
- Datalog
- Branch
- System

Setup

- 001 GENERAL
- 002 UTILITY
- 003 PASCOMIO
- 004 INTEGRATION
- 005 HOUR COUNTERS
 - 005 TREND GRAPH
 - 007 CORRECTIONS
 - 008 LIMIT THRESHOLDS
- 009 ALARMS
- 010 COUNTERS
- 011 ENERGY PULSES
- 012 LED
- 013 DIGITAL INPUTS
- 014 DIGITAL OUTPUTS
- 015 ANALOG INPUTS
- 016 ANALOG OUTPUTS
- 017 USER PAGES
- 018 TONES
- 019 ENERGY QUALITY
- 020 EASY BRANCH

Save to File | Load from File

Parameter file management
参数文件管理

DATA LOG

The data log is a data table which records in each row the date, time and relevant samples of the measurements selected by the user.

- Minimum sampling time ($T_s [s]$): 1s.
- Sampling mode: sync (sampling synchronized with the clock), loop (elimination of older files according to FIFO logic), play (sampling activated).
- Number of selectable measurements N : 32 with $T_s [s] \leq 60$ seconds, 128 otherwise.
- History $T [s]$ the web server automatically provides the historical depth that can be memorized as a function of the sampling time and the number of measurements, applying the formula:

$$T[s] = T_s[s] * INT(\frac{5242880}{24 + N * 13})$$

For example, with a sampling time of 60 seconds and 32 measurements, data is stored for 8 days and 6 hours. When the time expires, the oldest data is overwritten, or sampling stops based on the settings defined by the user.

Note: each time a new configuration is sent to the device, the saved data is deleted.

数据日志

数据日志是一个数据表，在每一行中记录了用户所选测量值的日期、时间和和相关采样情况。

- 最小采样时间 ($T_s [s]$): 1s。
- 采样模式: sync (与时钟同步采样)、loop (根据先进先出逻辑删除较旧的文件)、play (采样激活)。
- 可选测量值数量 N : $T_s [s] \leq 60$ 秒时为 32, 否则为 128。
- 历史 $T [s]$: 网络服务器自动提供可记忆的历史深度, 作为采样时间和测量值数量的函数, 应用公式:

$$T[s] = T_s[s] * INT(\frac{5242880}{24 + N * 13})$$

例如, 当采样时间为 60 秒, 测量值数量为 32 时, 将存储 8 天 6 小时的数据。当此时间过后, 最旧的数据会被覆盖, 或者根据用户定义的设置停止采样。

注: 每次向设备发送新配置时, 保存的数据就会被删除。

The screenshot shows the 'Data log' web interface. Callouts point to various features: 'Data log file download' (下载数据日志文件), 'Record number, free memory and time left' (记录数量、可用存储空间和剩余时间), 'Sampling time [s] and mode' (采样时间 [s] 和模式), 'Edit: start configuration' (编辑: 开始配置), 'Configuration: read from and write to device' (配置: 从设备读取和写入设备), 'Clock setting' (时钟设置), and 'Measures selection: origin (DMG or branch points), measure, type (AVG, MIN, MAX of the latest sampling time)' (选择测量值: 原始 (DMG 或分支点)、测量值、类型 (最近采样时间的 AVG、MIN、MAX)).

ENERGY QUALITY (DMG9000)

The energy quality function lets the user check that the quality of the voltage and the frequency of the installation are within the minimum parameters according to the EN 50160 standards.

The following phenomena are monitored (see menu M19):

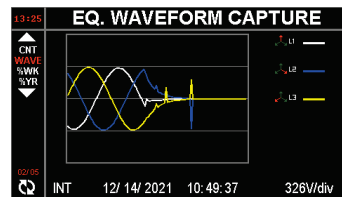
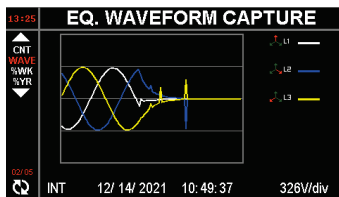
- slight variations of integrated average voltage (VLO - VHI);
 - large variations of integrated average voltage (NLO - NHI);
 - harmonic voltage distortion (THD or single harmonic levels);
 - phase asymmetry (ASY);
 - slight frequency variations (FLO-FHI);
 - large frequency variations (NLO-NHI);
 - sudden voltage reduction (DIPS);
 - sudden increase in voltage (SWELLS);
 - short voltage interruptions (INTERRUPTIONS);
 - long voltage interruptions (INTERRUPTIONS).
- The maximum limit thresholds allowed are adjustable by the user. The factory default values are fixed to the values specified by the EN 50160 standard.
 - Each event can be disabled by setting the corresponding threshold to OFF.
 - For all the phenomena listed above, when an anomaly occurs, an event is recorded in the events list.
 - For phenomena based on integrated measures (VHI-VLO-THD-HAR-ASY-FHI-FLO) time percentages are calculated which the parameters are outside the programmed limits. The display is available referring to the last week, to any week of the last year or to the last year.
 - For "sudden" events, the counters are incremented, indicating the number of times the anomaly has occurred since the date of the last reset via the command menu. These events are checked by comparing the RMS value of the voltage every half cycle of the fundamental frequency (eg 10ms at 50Hz).
 - The integration time for the voltage is 10 minutes, for the frequency 10 seconds.
 - In order to use the energy quality function, P01.03 and P01.08 must be programmed and P01.07 correctly set according to the type of wiring.
 - When the harmonic distortion control mode is set on single contributions (HAR), the thresholds for each harmonic order (up to 25th) are defined in the reference standard EN50160.
 - By enabling the waveform capture, up to 10 events (3 waveforms each event) DIP, SWELL or INTERRUPTION type can be recorded. The values of the waveforms can be downloaded through the built-in web server.

电能质量 (DMG9000)

通过电能质量功能, 用户可检查装置的电压和频率质量是否在 EN50160 标准规定的最小参数之内。

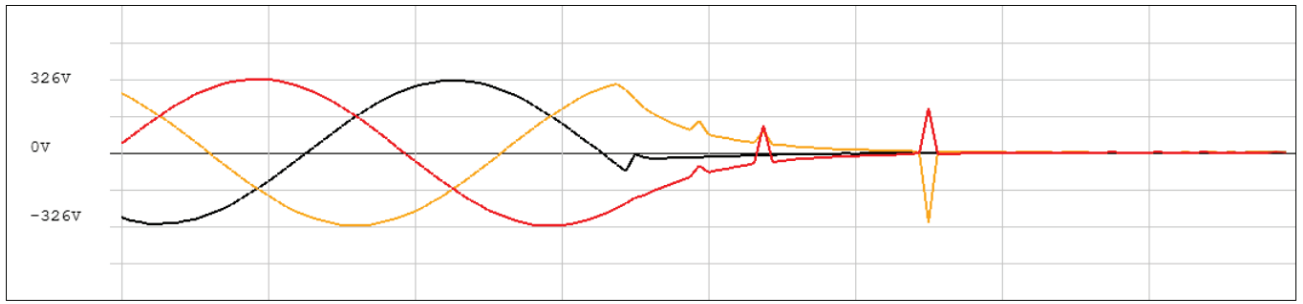
可监测以下现象 (参见菜单 M19):

- 积分平均电压的细微变化 (VLO - VHI);
 - 积分平均电压的显著变化 (VLO - VHI);
 - 谐波电压失真 (THD 或单次谐波电平);
 - 相位不对称 (ASY);
 - 频率的细微变化 (FLO-FHI);
 - 频率的显著变化 (NLO-NHI);
 - 电压骤降 (DIPS);
 - 电压骤升 (SWELLS);
 - 电压短时中断 (INTERRUPTIONS);
 - 电压长时中断 (INTERRUPTIONS);
- 用户可调整允许的最大门限。出厂默认值 被固定为 EN50160 标准规定的值。
 - 每个事件可通过将相应的阈值设置为 OFF 来禁用。
 - 对于上述所有现象, 当发生异常时, 就会在事件列表中记录一个事件。
 - 对于基于积分测量值 (VHI-VLO-THD-HAR-ASY-FHI-FLO) 的现象, 将计算参数超出编程限值的时间百分比。显示内容参考上周、去年任何一周或去年的情况。
 - 对于“突发”事件, 计数器会递增, 指示自上次通过命令菜单复位的日期以来, 发生异常的次数。这些事件通过比较基波频率每半个周期 (例如 50Hz 时为 10ms) 的电压 RMS 值进行检查。
 - 电压的积分时间为 10 分钟, 频率的积分时间为 10 秒。
 - 要使用电能质量功能, 必须对 P01.03 和 P01.08 进行编程, 并根据接线类型正确设置 P01.07。
 - 当基于单次贡献 (HAR) 设置谐波失真控制模式时, 每个谐波次数 (最高 25 次) 的阈值在参考标准 EN50160 中定义。
 - 通过启用波形捕捉功能, 最多可记录 10 个 DIP、SWELL 或 INTERRUPTION 类型的事件 (每个事件 3 个波形)。波形的值可通过内置的网络服务器下载。



14/12/2021 10:49:37 INT

VL1-N VL2-N VL3-N



PASSWORD ACCESS

The password enables access to the setting menu, the commands menu or remote connection via communication ports. At the first start, the DMGs have the password disabled: it must be set using the functions of menu M03.

There are different levels of access:

- user level (code programmed in P03.02): it is possible to access the M02 (utility) menu, the reset commands of the recorded values (excluding the total energy meters) and of the status variables;
- advanced level (code programmed in P03.03): access to all commands and parameter settings is allowed;
- remote password (code programmed in P03.04): entering this code must come first to access through the communication interface (settings, commands and reading of the measures);
- web setup (code programmed in P03.05, only for DMG8000 and DMG9000): this code must be entered to enable access to the parameter settings and the integrated data log via the web server.

To enter the password, access the menu using the ≡ button and select the "key" icon (access to the commands and settings menus is inhibited, as highlighted by the gray icons, which mean not active):



Enter the 4-digit password, then press OK. If the entered password is correct, the relevant unlock message appears.

Once the password is unlocked, access remains enabled until:

- the device is disconnected or restarted by exiting the settings menu;
- more than 2 minutes pass without the operator touching any button.

PARAMETER SETUP

Starting from the measurement reading pages, press the ≡ button to access the menu and then select the "gear" icon to access the setup. If the icon is gray, the password is required.



The list of available menus is displayed.

MENU	DESCRIPTION
M01	General
M02	Utility
M03	Password
M04	Integration
M05	Hour counter
M06	Trend graph
M07	Communication
M08	Limit thresholds
M09	Alarms
M10	Counters
M11	Energy pulses
M12	LED
M13	Digital inputs
M14	Digital outputs
M15	Analog inputs
M16	Analog outputs
M17	User pages
M18	Timers
M19	Energy quality (DMG9000)
M20	EASY BRANCH (DMG7500 - DMG8000 - DMG9000)

密码访问

通过密码可访问设置菜单、命令菜单或通过通讯端口进行远程连接。

首次启动时，DMG 的密码处于禁用状态：必须使用菜单 M03 的功能进行设置。

有三个不同的访问级别：

- 用户级（代码在 P03.02 中编程）：可访问 M02（实用功能）菜单、记录值（不包括总电能表）和状态变量的复位命令；
- 高级（代码在 P03.03 中编程）：允许访问所有命令和参数设置；
- 远程密码（代码在 P03.04 中编程）：必须先输入此代码，才能通过通讯接口访问（设置、命令和测量值读数）；
- 网络设置（代码在 P03.05 中编程，仅适用于 DMG8000 和 DMG9000）：必须输入此代码才能通过网络服务器访问参数设置和积分数据。

要输入密码，请使用 ≡ 按钮访问菜单，然后选择“钥匙”图标（如灰色图标所示，禁止访问命令和设置菜单，这表示未激活）：



输入 4 位密码，然后按 OK。如果输入的密码正确，则将显示相关解锁消息。

一旦密码解锁，访问权限将保持启用，直到：

- 设备断开连接，或通过退出设置菜单重启；
- 操作员超过 2 分钟未触碰任何按钮。

参数设置

从测量值读数页面开始，按 ≡ 按钮访问菜单，然后选择“齿轮”按钮访问设置。如果图标为灰色，则需要密码。



显示可用菜单列表。

菜单	描述
M01	常规
M02	实用程序
M03	密码
M04	积分
M05	计时器
M06	趋势图
M07	通讯
M08	门限
M09	报警
M10	计数器
M11	电能脉冲
M12	LED
M13	数字输入
M14	数字输出
M15	模拟输入
M16	模拟输出
M17	用户页面
M18	定时器
M19	电能质量 (DMG9000)
M20	易回路 (DMG7500 - DMG8000 - DMG9000)

- Keys ▲ ▼ : move the selection to the different menu or parameter items, increase or decrease the values;
- Key ○ : confirms the selection or the entered value;
- Key ⇐ : back to the previous selection or exit setup.

M01 - GENERAL		UdM	Default	Range
P01.01	CT primary (I1-I2-I3)	A	5	1-10000
P01.02	CT secondary (I1-I2-I3)	A	5	1/5
P01.03	Rated voltage	V	400	AUT / 50-50000
P01.04	VT usage		OFF	OFF-ON
P01.05	VT primary	V	100	50-50000
P01.06	VT secondary	V	100	50-500
P01.07	Connection type		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
P01.08	Rated frequency	Hz	AUT	AUT-50-60-400
P01.09	Reactive power calculation method		TOT	TOT-FUND
P01.10	V4 measure		OFF	OFF-Earth
P01.11	CT (4) measure		OFF	OFF-Neutral-Earth
P01.12	CT primary (4)	A	5	1-10000
P01.13	CT secondary (4)	A	5.0	0.1-5.0

P01.01 – Rated current of the CT primary.
P01.02 – CT secondary current.
P01.03 – Rated voltage of the system. Leaving the setting on AUT the multimeter automatically adjusts the scale of the graphic bars.
P01.04 – Set to ON if VTs are used. If set to OFF the following two parameters are ignored.
P01.05 – VT primary rated voltage.
P01.06 – VT secondary rated voltage.
P01.07 – Set in accordance with the connection diagram used. See connection diagrams at the end of the manual.
P01.08 – Rated frequency of the line. With setting on AUT, it is automatically chosen in the range between 50 and 60Hz. In case the energy quality function is enabled or the system works at 400Hz, manually select the mains frequency.
P01.09 – Selects the calculation method for reactive power.
TOT: reactive power also includes harmonic contribution. In this case:
 $P_{\text{reactive}}^2 = P_{\text{apparent}}^2 - P_{\text{active}}^2$
FUND: reactive power includes only the contribution of the fundamental frequency. In this case:
 $P_{\text{reactive}}^2 \leq P_{\text{apparent}}^2 - P_{\text{active}}^2$
Papparent still contains the harmonic contribution (Same value as in the TOT case).
 In the absence of voltage and current harmonics, the two calculation methods provide the same result and $PF = \cos \phi$.
P01.10 (DMG9000 only) – Enabling of voltage measurement between neutral wire and earth.
P01.11 (DMG9000 only) – Selection of the CT 4 position.
OFF: current input 4 disabled.
Neutral: CT 4 is installed on the neutral wire.
Ground: CT 4 is installed on the earth wire.
P01.12 (DMG9000 only) – Rated current of the CT 4 primary.
P01.13 (DMG9000 only) – CT 4 secondary current.

M02 - UTILITY		UdM	Default	Range
P02.01	Language		English	English Italian French Spanish German Portuguese Polish Czech Russian Chinese
P02.02	Themes		Dark 1	Dark 1 Light 1 Dark 2 Light 2 Dark 3 Light 3 Dark 4 Light 4 Dark 5 Light 5 Dark 6 Light 6
P02.03	Backlight high intensity	%	100	0-100
P02.04	Backlight low intensity	%	25	0-50
P02.05	Time to switch to low intensity	sec	180	OFF / 5-600
P02.06	Default page return	sec	300	OFF / 10-600
P02.07	Default page		HOME	HOME Voltages ...
P02.08	Default sub-page		INST	INST-MAX-MIN-AVG-MD 1-40
P02.09	Display update time	sec	0.5	0.1 - 5.0
P02.10	Plant description		HOME	(20 characters free text)
P02.11	Tariff enabling		OFF	OFF-ON

- ▲ ▼ 键：将选择移动到不同菜单或参数项，增加或减少值；
- ○ 键：确认选择或输入的值；
- ⇐ 键：返回之前的选择或退出设置。

M01 — 常规		度量单位	默认值	范围
P01.01	CT 一次电流 (I1-I2-I3)	A	5	1-10000
P01.02	CT 二次电流 (I1-I2-I3)	A	5	1/5
P01.03	额定电压	V	400	AUT / 50-50000
P01.04	VT 使用量		OFF	OFF-ON
P01.05	VT 一次电压	V	100	50-50000
P01.06	VT 二次电压	V	100	50-500
P01.07	连接类型		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
P01.08	额定频率	Hz	AUT	AUT-50-60-400
P01.09	无功功率计算方法		TOT	TOT-FUND
P01.10	V4 测量		OFF	OFF-Earth
P01.11	CT (4) 测量		OFF	OFF-Neutral-Earth
P01.12	CT 一次电流 (4)	A	5	1-10000
P01.13	CT 二次电流 (4)	A	5.0	0.1-5.0

P01.01 — CT 一次额定电流。
P01.02 — CT 二次电流。
P01.03 — 系统的额定电压。将设置保留为 AUT，万用表会自动调整条形图的标度。
P01.04 — 如果使用 VT，则设置为 ON。如果设置为 OFF，将忽略以下两个参数。
P01.05 — VT 一次额定电压。
P01.06 — VT 二次额定电压。
P01.07 — 根据所使用的连接图进行设置。请参见手册末尾的连接图。
P01.08 — 线路的额定频率。设置为 AUT 时，将在 50-60Hz 的范围内自动选择。如果启用了电能质量功能或系统在 400Hz 下工作，则手动选择市电频率。
P01.09 — 选择无功功率的计算方法。
TOT: 无功功率还包括谐波贡献。在此情况下：
 $P_{\text{无功}}^2 = P_{\text{视在}}^2 - P_{\text{有功}}^2$
FUND: 无功功率仅包括基波频率的贡献。在此情况下：
 $P_{\text{无功}}^2 \leq P_{\text{视在}}^2 - P_{\text{有功}}^2$
 $P_{\text{视在}}$ 还包含谐波贡献（与在 TOT 情况下的值相同）。
 在没有电压和电流谐波的情况下，两种计算方法提供相同的结果，且 $PF = \cos \phi$ 。
P01.10（仅限 DMG9000）— 启用中性线和接地线之间的电压测量。
P01.11（仅限 DMG9000）— 选择 CT 4 位置。
OFF: 禁用电流输入 4。
Neutral: CT 4 安装在中性线上。
Ground: CT 4 安装在接地线上。
P01.12（仅限 DMG9000）— CT 4 一次额定电流。
P01.13（仅限 DMG9000）— CT 4 二次电流。

M02 — 实用功能		度量单位	默认值	范围
P02.01	语言		English	English Italian French Spanish German Portuguese Polish Czech Russian Chinese
P02.02	主题		深色 1	深色 1 浅色 1 深色 2 浅色 2 深色 3 浅色 3 深色 4 浅色 4 深色 5 浅色 5 深色 6 浅色 6
P02.03	高强度背光	%	100	0-100
P02.04	低强度背光	%	25	0-50
P02.05	切换到低强度的时间	sec	180	OFF/5-600
P02.06	返回默认页面	sec	300	OFF/5-600
P02.07	默认页面		HOME	HOME

P02.12	DNS server 1		000.000.000.000	000.000.000.000 ... 255.255.255.255
P02.13	DNS server 2		000.000.000.000	000.000.000.000 ... 255.255.255.255
P02.14	Remote server URL		mqtt.lovatoelectric.com	(40 characters free text)

P02.06 – If set to OFF, the display always remains on the page where it was left by the user. If set to a value, after this time the display returns to the page set with P02.07.
P02.07 – Page to which the display automatically returns once the time P02.06 has elapsed since the last time a key was pressed.
P02.08 – Sub-page to which the display automatically returns once the time P02.06 has elapsed since the last time a key was pressed.
P02.10 – Alphanumeric description of the system shown as the title of the HOME page.
P02.11 – Enabling tariff pages.
P02.12, P02.13 – IP addresses of the Domain Name System (DNS) servers.
P02.14 – URL for connecting to remote servers in client mode operation of the 以太网 port.

M03 - PASSWORD		UdM	Default	Range
P03.01	Password enabling		OFF	OFF-ON
P03.02	User level password		1000	0-9999
P03.03	Advanced level password		2000	0-9999
P03.04	Remote password		OFF	OFF / 0001-9999
P03.05	Web setup enabling		ON	OFF-ON

For the use of passwords, refer to the appropriate section.
P03.01 – If set to OFF, password management is disabled and access to the settings and commands menu is free.
P03.02 – With P03.01 active, value to be specified to activate user level access.
P03.03 – With P03.01 active, value to be specified to activate access at an advanced level.
P03.04 – With P03.01 active, value to be specified to activate remote access via software. It does not depend on P03.01.
P03.05 – Value to be specified to activate the modification of parameters and 数据日志 via web server. It does not depend on P03.01.

M04 - INTEGRATION		UdM	Default	Range
P04.01	Integration mode		Mobile	Fixed Sliding Synchronism Bus
P04.02	Power integration time	min	15	1-60
P04.03	Current integration time	min	15	1-60
P04.04	Voltage integration time	min	1	1-60
P04.05	Frequency integration time	min	1	1-60
P04.06	Power integration time (Branch)	min	15	1-60
P04.07	Current integration time (Branch)	min	15	1-60

P04.01 – Selection of the calculation mode of the integrated measures.
Fixed: at each expiration of the set time, the average values (AVG) are updated with the result of the last integration. At the same time, the max demand (MD) is checked and updated if necessary.
Sliding: AVG and MD are updated every 1/15 of the set time, considering a sliding window in time which includes the last 15 calculated values, of total length equivalent to the set time.
Synchronism: as fixed mode, but the expiry of the time is given by an external digital input programmed with the synchronism function.
Bus: as fixed mode, but the expiry of the time is given by synchronism messages sent on the serial bus.
P04.02 – AVG (average) measurement integration time for active, reactive and apparent powers.
P04.03, P04.04, P04.05 – AVG (average) measurement integration time for the relevant quantities.
P04.06 – AVG (average) measurement integration time for active, reactive and apparent powers of the EASY BRANCH measurement points.
P04.07 – AVG (average) measurement integration time for the currents of the EASY BRANCH measurement points.

M05 - HOUR COUNTERS		UdM	Default	Range
P05.01	General hour counter enabling		ON	OFF-ON
P05.02	Partial hour counter enabling 1		ON	OFF-ON
P05.03	Channel number hour counter 1 (x)		1	1-40
P05.04	Partial hour counter enabling 2		ON	OFF-ON
P05.05	Channel number hour counter 2 (x)		1	1-40
P05.06	Partial hour counter enabling 3		ON	OFF-ON
P05.07	Channel number hour counter 3 (x)		1	1-40
P05.08	Partial hour counter enabling 4		ON	OFF-ON
P05.09	Channel number hour counter 4 (x)		1	1-40

P05.01 – If OFF the hour counters are disabled and the hour counter page is not displayed.
P05.02 – If OFF the partial hour counter 1 is not increased. If ON it is increased when the multimeter is powered. If combined with one of the internal variables (LIMx-INPx-PLCx) it is increased only when the variable is active.
P05.03 – Channel number (x) of the internal variable possibly used in the previous parameter. Example: if the partial hour counter 1 must count the time for which a measurement is over a certain threshold, defined by the LIM3 limit, set LIMx in the previous parameter and specify 3 in this parameter.
P05.04, P05.05, P05.06, P05.07, P05.08, P05.09 – Similar to parameters P05.02 and P05.03, but referring to hour counters 2, 3 and 4.

				Voltages
P02.08	默认子页面		INST	INST-MAX-MIN-AVG-MD 1-40
P02.09	显示屏更新时间	sec	0.5	0.1 - 5.0
P02.10	工厂描述		HOME	(20 个字符自由文本)
P02.11	启用费率		OFF	OFF-ON
P02.12	DNS 服务器 1		000.000.000.000	000.000.000.000 ... 255.255.255.255
P02.13	DNS 服务器 2		000.000.000.000	000.000.000.000 ... 255.255.255.255
P02.14	远程服务器 URL		mqtt.lovatoelectric.com	(40 个字符自由文本)

P02.06 – 如果设置为 OFF, 显示屏将一直显示用户离开时的页面。如果设置为一个值, 则此时间过后, 显示屏将返回 P02.07 设置的页面。
P02.07 – 自从上次按下某个键且 P02.06 时间过后, 显示屏会自动返回到该页面。
P02.08 – 自从上次按下某个键且 P02.06 时间过后, 显示屏会自动返回到该子页面。
P02.10 – 系统的字母数字描述, 显示为 HOME 页面的标题。
P02.11 – 启用费率页面。
P02.12, P02.13 – 域名系统 (DNS) 服务器的 IP 地址。
P02.14 – 用于在以太网端口的客户端模式下连接到远程服务器的 URL。

M03 - 一密码		度量单位	默认值	范围
P03.01	启用密码		OFF	OFF-ON
P03.02	用户级密码		1000	0-9999
P03.03	高级密码		2000	0-9999
P03.04	远程密码		OFF	OFF / 0001-9999
P03.05	启用网络设置		ON	OFF-ON

要使用密码, 请参见相应部分。
P03.01 – 如果设置为 OFF, 密码管理将禁用, 并可随意访问设置和命令菜单。
P03.02 – P03.01 激活时, 激活用户级访问需要指定的值。
P03.03 – P03.01 激活时, 激活高级访问需要指定的值。
P03.04 – P03.01 激活时, 激活通过软件远程访问需要指定的值。它不依赖于 P03.01。
P03.05 – 激活通过 网络服务器修改参数和数据日志需要指定的值。它不依赖于 P03.01。

M04 - 积分		度量单位	默认值	范围
P04.01	积分模式		Mobile	Fixed Sliding Synchronism Bus
P04.02	功率积分时间	min	15	1-60
P04.03	电流积分时间	min	15	1-60
P04.04	电压积分时间	min	1	1-60
P04.05	频率积分时间	min	1	1-60
P04.06	功率积分时间 (支路)	min	15	1-60
P04.07	电流积分时间 (支路)	min	15	1-60

P04.01 – 选择积分测量值的计算模式。
Fixed: 在每次设定的时间到期时, 平均值(AVG) 会根据上次积分的结果进行更新。与此同时, 检查最大需量 (MD) 并在必要时更新。
Sliding: AVG 和 MD 每隔 1/15 的设定时间更新一次, 考虑一个时间滑窗, 其中包括最近 15 个计算值, 总长度相当于设定时间。
Synchronism: 与 Fixed 模式一样, 但时间到期由使用同步功能编程的外部数字输入给出。
Bus: 与 Fixed 模式一样, 但时间到期由串行总线发送的同步消息给出。
P04.02 – 有功、无功和视在功率的 AVG (平均) 测量值积分时间。
P04.03, P04.04, P04.05 – 相关电量的 AVG (平均) 测量值积分时间。
P04.06 – 易回路测量点的有功、无功和视在功率的 AVG (平均) 测量值积分时间。
P04.07 – 易回路测量点电流的 AVG (平均) 测量值积分时间。

M05 - 计时器		度量单位	默认值	范围
P05.01	启用常规计时器		ON	OFF-ON
P05.02	启用局部计时器 1		ON	OFF-ON
P05.03	信道编号计时器 1 (x)		1	1-40
P05.04	启用局部计时器 2		ON	OFF-ON
P05.05	信道编号计时器 2 (x)		1	1-40
P05.06	启用局部计时器 3		ON	OFF-ON
P05.07	信道编号计时器 3 (x)		1	1-40
P05.08	启用局部计时器 4		ON	OFF-ON

M06 - TREND GRAPHS (TRDn, n=1...40)		UdM	Default			Range	
P06.n.01	Measure for trend page		n	Measure	Source	Load	OFF VL-N VL-L A kW kvar kVA
			1	kW	MAIN	TOT	
			2	kvar	MAIN	TOT	
			3	kVA	MAIN	TOT	
			4	VL-N	MAIN	TOT	
			5	VL-L	MAIN	TOT	
			6	A	MAIN	L1	
			7	A	MAIN	L2	
			8	A	MAIN	L3	
			9...40	kW	BRN(n-8)	TOT	
P06.n.02	Source		n=1...8: MAIN n=9...40: BRN(n-8)			MAIN BRN0...32	
P06.n.03	Load number		n≠(6, 7, 8): TOT n=6: 1 n=7: 2 n=8: 3			TOT 1 2 3	
P06.n.04	Autoscale		ON			OFF-ON	
P06.n.05	Full scale value		1000			0-1000	
P06.n.06	Full scale multiplier		x1k			x1 - x1k - x1M	
P06.n.07	Vertical scale type		n≠2: POS n=2: POS-NEG			POS NEG POS-NEG	

P06.n.01 - Select the measurement to be displayed on the trend graph. The time scale has the resolution defined by the integration menu for the selected measurement.
P06.n.02 - Source from which the measurement is taken. MAIN is the main multimeter, while BRNx are the measurement points of the EASY BRANCH system in sequence as they are recognized by the main multimeter.
P06.n.03 - Each source is three-phase. With this parameter the load is select, that is if L1, L2, L3 or total.
P06.n.04 - Enable automatic adaptation of the scale to the displayed values.
P06.n.05 - Full scale value defined by the user when parameter P06.n.04 is OFF. The unit of measurement becomes the one of the selected measurement.
P06.n.06 - Multiplier of the full scale value.
P06.n.07 - Defines if the vertical scale of the trend has only positive, negative or symmetrical positive-negative values.

M07 - COMMUNICATION (COMn, n=1...3)		UdM	Default	Range
P07.n.01	Serial node address		1	1-255
P07.n.02	Serial speed	bps	9600	1200 2400 4800 9600 19200 38400 57600 115200
P07.n.03	Data format		8 bit-none	8 bit-none 8 bit-odd 8 bit-even 7 bit-odd 7 bit-even
P07.n.04	Stop bit		1	1-2
P07.n.05	Protocol		Modbus RTU	Modbus RTU Modbus ASCII Modbus TCP
P07.n.06	IP address		192.168.1.1	000.000.000.000 ... 255.255.255.255
P07.n.07	Subnet mask		255.255.255.000	000.000.000.000 ... 255.255.255.255
P07.n.08	IP port		502	0-32000
P07.n.09	Channel function		Slave	Slave-Gateway
P07.n.10	Client / Server		Server	Client Server
P07.n.11	Remote IP address		000.000.000.000	000.000.000.000 ... 255.255.255.255
P07.n.12	Remote IP port		502	0-32000
P07.n.13	Gateway IP address		000.000.000.000	000.000.000.000 ... 255.255.255.255

P07.n.01 - Serial address (node) of the communication protocol.
P07.n.02 - Transmission speed of the communication port.
P07.n.03 - Data format. 7-bit settings only possible for ASCII protocol.
P07.n.04 - Number of stop bits.
P07.n.05 - Choice of communication protocol.
P07.n.06, P07.n.07, P07.n.13 - TCP-IP coordinates for applications with 以太网 interface.
P07.n.08 - Port open for incoming connections when P07.n.10 = server.
P07.n.09 - Enabling the gateway function. See details in the section "Communication channels".
P07.n.10 - Activation of the TCP-IP connection.
Server: waits for connection from a remote client.
Client: if P02.12 or P02.13 are set, it establishes a connection with the URL specified in P02.14, otherwise to a remote server at the address specified by P07.n.11.
P07.n.11, P07.n.12 - Coordinates for the connection to the remote server when P07.n.10 is set to client.

				INPx-LIMx-PLCx
P05.09	信道编号计时器 4 (x)		1	1-40

P05.01 - 如果设置为 OFF, 计时器将禁用, 并且不显示计时器页面。
P05.02 - 如果设置为 OFF, 局部计时器 1 不会增加。如果设置为 ON, 万用表通电时, 该计时器将增加。如果结合其中一个内部变量 (LIMx-INPx-PLCx), 只有当该变量被激活时, 该计时器才会增加。
P05.03 - 前一个参数中可能使用的内部变量的信道编号 (x)。例如: 如果局部计时器 1 必须计算某个测量值高于某一阈值 (由 LIM3 限值定义) 的时间, 则需要在前一个参数中设置 LIMx, 并在此参数中指定 3。
P05.04, P05.05, P05.06, P05.07, P05.08, P05.09 - 与参数 P05.02 和 P05.03 类似, 但参考计时器 2、3 和 4。

M06 - 趋势图 (TRDn, n=1...40)		度量单位	默认值			范围	
P06.n.01	测量值趋势页面		n	测量值	来源	负载	OFF VL-N VL-L A kW kvar kVA
			1	kW	MAIN	TOT	
			2	kvar	MAIN	TOT	
			3	kVA	MAIN	TOT	
			4	VL-N	MAIN	TOT	
			5	VL-L	MAIN	TOT	
			6	A	MAIN	L1	
			7	A	MAIN	L2	
			8	A	MAIN	L3	
			9...40	kW	BRN(n-8)	TOT	
P06.n.02	来源		n=1...8: MAIN n=9...40: BRN(n-8)			MAIN BRN0...32	
P06.n.03	负载编号		n≠(6, 7, 8): TOT n=6: 1 n=7: 2 n=8: 3			TOT 1 2 3	
P06.n.04	自动标度		ON			OFF-ON	
P06.n.05	全标度值		1000			0-1000	
P06.n.06	全标度乘数		x1k			x1 - x1k - x1M	
P06.n.07	垂直标度类型		n≠2: POS n=2: POS-NEG			POS NEG POS-NEG	

P06.n.01 - 选择要在趋势图上显示的测量值。时标的分辨率由所选测量值的积分菜单定义。
P06.n.02 - 采集测量值的来源。MAIN 为主万用表, 而 BRNx 为易回路系统的测量点, 按主万用表识别的顺序排列。
P06.n.03 - 每个来源为三相。通过此参数可选择负载, 即 L1、L2、L3 或总计。
P06.n.04 - 启用自动调整标度以适应显示的值得。
P06.n.05 - 当参数 P06.n.04 为 OFF 时, 由用户定义的全标度值。度量单位变为所选测量值的单位。
P06.n.06 - 全标度值的乘数。
P06.n.07 - 定义趋势的垂直标度是否只有正值、负值或对称的正负值。

M07 - 通讯 (COMn, n=1...3)		度量单位	默认值	范围
P07.n.01	串行节点地址		1	1-255
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-none	8 bit-none 8 bit-odd 8 bit-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		192.168.1.1	000.000.000.000 ... 255.255.255.255
P07.n.07	子网掩码		255.255.255.000	000.000.000.000 ... 255.255.255.255
P07.n.08	IP 端口		502	0-32000
P07.n.09	信道功能		Slave	Slave-Gateway
P07.n.10	客户端/服务器		Server	Client Server

M08 - LIMIT THRESHOLDS (LIMn, n=1...40)		UdM	Default	Range
P08.n.01	Reference measure		OFF	OFF-(measures)
P08.n.02	Source		MAIN	MAIN BRN01...32
P08.n.03	Load number		TOT	TOT-1-2-3
P08.n.04	Channel		1	0-40
P08.n.05	Function		Max	Max - Min - Min+Max
P08.n.06	Upper threshold		0	-9999 - +9999
P08.n.07	Multiplier		x1	/100 /10 x1 x10 x100 x1k x10k
P08.n.08	Delay	sec	0	0.0 - 600.0
P08.n.09	Lower threshold		0	-9999 - +9999
P08.n.10	Channel number hour counter		x1	/100 /10 x1 x10 x100 x1k x10k
P08.n.11	Channel number hour counter	sec	0	0.0 - 600.0
P08.n.12	OFF status		OFF	OFF-ON
P08.n.13	Latch		OFF	OFF-ON
<p>P08.n.01 - Defines to which of the multimeter measurements the limit threshold must be applied. P08.n.02 - Source from which the measurement is taken. MAIN is the main multimeter, while BRNx are the measurement points of the EASY BRANCH system in sequence as they are recognized by the main multimeter. P08.n.03 - Each source is three-phase. By this parameter the load is selected, that is if L1, L2, L3 or total. P08.n.04 - Channel number referred to parameter P08.n.01. P08.n.05 - Defines the operation of the limit threshold. It could be: Max: LIMn active when the measurement exceeds P08.n.06. P08.n.09 is the reset threshold. Min: LIMn active when the measurement is lower than P08.n.09. P08.n.06 is the reset threshold. Min + Max: LIMn active when the measurement is higher than P08.n.06 or lower than P08.n.09. P08.n.06, P08.n.07 - Definition of the upper threshold, which is given by the value of P08.n.06 multiplied by P08.n.07. P08.n.08 - Trip delay on the upper threshold. P08.n.09, P08.n.10 - Definition of the lower threshold, which is given by the value of P08.n.09 multiplied by P08.n.10. P08.n.11 - Trip delay on the lower threshold. P08.n.12 - Reverse the status of the LIMn limit. P08.n.13 - Memory function for the threshold. ON: the threshold remains stored and must be reset manually via the commands menu or from the limits page. OFF: reset is automatic.</p>				

M09 - ALARMS (ALAn, n=1...40)		UdM	Default	Range
P09.n.01	Alarm source		OFF	OFF-LIMx-INPx-PLCx-TIMx
P09.n.02	Channel number (x)		1	1-40
P09.n.03	Latch		OFF	OFF-ON
P09.n.04	Priority		Low	Low - High
P09.n.05	Text		ALAn	(16 characters free text)
<p>P09.n.01 - Signal which causes the alarm. It can be the exceeding of a threshold (LIMx), the activation of an external input (INPx), a logical condition (PLCx) or the expiration of a timer (TIMx). P09.n.02 - Channel number x referred to the previous parameter. P09.n.03 - Memory function for the alarm. ON: the alarm remains stored and must be reset manually via the commands menu or from the alarms page. OFF: reset is automatic. P09.n.04 - If the alarm has high priority (High), when it occurs it causes the automatic shift of the display on the alarm page and is displayed with the "alarm" icon. If, on the other hand, it is set to low priority, the page does not change and is displayed with the "information" icon. P09.n.05 - Free text of the alarm. Max. 16 characters.</p>				

M10 - COUNTERS (CNTn, n=1...8)		UdM	Default	Range
P10.n.01	Counter source		OFF	OFF-ON-INPx-LIMx-PLCx-ALAx
P10.n.02	Channel number (x)		1	1-40
P10.n.03	Multiplier		1	1-1000
P10.n.04	Divider		1	1-1000
P10.n.05	Description		CNTn	(16 characters free text)
P10.n.06	Unit		Umn	(6 characters free text)
P10.n.07	Count reset source		OFF	OFF-ON-INPx-LIMx-PLCx-ALAx
P10.n.08	Channel number (x)		1	1-40
<p>P10.n.01 - Signal that causes the count to increase (on the rising edge). It can be the powering up of the multimeter (ON), the activation of an external input (INPx), the exceeding of a threshold (LIMx), a logical condition (PLCx) or an alarm (ALAx). P10.n.02 - Channel number x referred to the previous parameter. P10.n.03 - Multiplicative K. The counted pulses are multiplied by this value before being displayed. P10.n.04 - Fractional K. The counted pulses are divided by this value before being displayed. If different from 1, the counter is displayed with 2 decimal digits. P10.n.07 - Signal that causes the count to be reset. With this signal active, the count remains at zero. P10.n.08 - Channel number x referred to the previous parameter.</p>				

M11 - PULSES (PULn, n=1...5)		UdM	Default	Range
P11.n.01	Source measure		kWh+	kWh+ kWh- kvarh+ kvarh- kVAh
P11.n.02	Pulse number per k-unit-h		1000	1-10-100-1000-10k
P11.n.03	Pulse duration	sec	0.1	0.01-1.00

P07.n.11	远程 IP 地址		000.000.000.000	000.000.000.000 ... 255.255.255.255
P07.n.12	远程 IP 端口		502	0-32000
P07.n.13	网关 IP 地址		000.000.000.000	000.000.000.000 ... 255.255.255.255
<p>P07.n.01 - 通讯协议的串行地址 (节点)。 P07.n.02 - 通讯端口的传输速度。 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 - 通讯协议选择。 P07.n.06, P07.n.07, P07.n.13 - 以太网接口的应用的 TCP-IP 坐标。 P07.n.08 - 当 P07.n.10 = 服务器时, 为输入连接开放的端口。 P07.n.09 - 启用网关功能。请参见“通讯信道”了解详情。 P07.n.10 - 激活 TCP-IP 连接。 Server: 等待远程客户端连接。 Client: 如果设置了 P02.12 或 P02.13, 将与 P02.14 中指定的 URL 建立连接, 否则与 P07.n.11 中指定的地址的远程服务器建立连接。 P07.n.11, P07.n.12 - 当 P07.n.10 设置为客户端时, 与远程服务器连接使用的坐标。</p>				

M08 - 门限 (LIMn, n=1...40)	度量单位	默认值	范围	
P08.n.01	参考测量值	OFF	OFF- (测量值)	
P08.n.02	来源	MAIN	MAIN BRN01...32	
P08.n.03	负载编号	TOT	TOT-1-2-3	
P08.n.04	信道	1	0-40	
P08.n.05	功能	Max	Max - Min - Min+Max	
P08.n.06	上限	0	-9999 - +9999	
P08.n.07	乘数	x1	/100 /10 x1 x10 x100 x1k x10k	
P08.n.08	延迟	sec	0	0.0 - 600.0
P08.n.09	下限	0	-9999 - +9999	
P08.n.10	信道编号计时器	x1	/100 /10 x1 x10 x100 x1k x10k	
P08.n.11	信道编号计时器	sec	0	0.0 - 600.0
P08.n.12	OFF 状态	OFF	OFF-ON	
P08.n.13	锁存	OFF	OFF-ON	
<p>P08.n.01 定义必须对哪些万用表测量值应用门限。 P08.n.02 采集测量值的来源。MAIN 为主万用表, 而 BRNx 为易回路系统的测量点, 按主万用表识别的顺序排列。 P08.n.03 每个来源为三相。通过此参数可选择负载, 即 L1、L2、L3 或总计。 P08.n.04 参考参数 P08.n.01 的信道编号。 P08.n.05 定义门限的应用。可以是: Max: 当测量值大于 P08.n.06 时, LIMn 激活。P08.n.09 是复位阈值。 Min: 当测量值小于 P08.n.09 时, LIMn 激活。P08.n.06 是复位阈值。 Min + Max: 当测量值大于 P08.n.06 或小于 P08.n.09 时, LIMn 激活。 P08.n.06, P08.n.07 定义上限, 即 P08.n.06 乘以 P08.n.07 得出的值。 P08.n.08 一触发上限延迟。 P08.n.09, P08.n.10 定义下限, 即 P08.n.09 乘以 P08.n.10 得出的值。 P08.n.11 一触发下限延迟。 P08.n.12 一反转 LIMn 限值的状态。 P08.n.13 一阈值的记忆功能。 ON: 一直存储阈值, 必须通过命令菜单或从限值页面手动复位。 OFF: 自动复位。</p>				

M09 - 报警 (ALAn, n=1...40)	度量单位	默认值	范围
P09.n.01	报警来源	OFF	OFF-LIMx-INPx-PLCx-TIMx
P09.n.02	信道编号 (x)	1	1-40
P09.n.03	锁存	OFF	OFF-ON
P09.n.04	优先级	Low	Low - High
P09.n.05	文本	ALAn	(16 个字符自由文本)
<p>P09.n.01 一触发报警的信号。这可以是超出阈值 (LIMx)、外部输入激活 (INPx)、逻辑条件 (PLCx) 或定时器到期 (TIMx)。 P09.n.02 一参考前一个参数的信道编号 (x)。 P09.n.03 一报警的记忆功能。 ON: 一直存储报警, 必须通过命令菜单或从报警页面手动复位。 OFF: 自动复位。 P09.n.04 一如果报警具有高优先级 (High), 当发生报警时, 报警页面上的显示内容会自动转换, 并显示“报警”图标。另一方面, 如果设置为低优先级, 页面将保持不变并显示“信息”图标。 P09.n.05 一报警的自由文本。最多 16 个字符。</p>			

M10 - 计数器 (CNTn, n=1...8)	度量单位	默认值	范围
P10.n.01	计数器来源	OFF	OFF-ON-INPx-LIMx-PLCx-ALAx
P10.n.02	信道编号 (x)	1	1-40

P11.n.04	CT position		Secondary	Primary-Secondary
<p>P11.n.01 – Type of energy to which the impulse is linked. P11.n.02 – Number of pulses for each kWh, kvarh, kVAh. P11.n.03 – ON pulse duration. P11.n.04 – Indicates whether the pulse count refers to the energy value of the CT primary or secondary.</p>				

M12 – LED (LEDn, n=1...3)		UdM	Default	Range
P12.n.01	LED function		n=1: ON n=2: COM n=3: ALA	OFF-ON-LIMx-INPx-OUTx-REMx-PLCx-ALAx-COM-PULx-GLOBAL ALARM-GLOBAL WARNING
P12.n.02	Channel number (x)		1	1-40
P12.n.03	LED flash		OFF	OFF-ON-LIMx-INPx-OUTx-REMx-PLCx-ALAx-COM-PULx-GLOBAL ALARM-GLOBAL WARNING
P12.n.04	Channel number (x)		1	1-40
<p>P12.n.01 – Function associated with the LED. P12.n.02 – Channel number x referred to the previous parameter. P12.n.03 – Function that causes the LED to flash. This function has priority over P12.n.01. P12.n.04 – Channel number x referred to the previous parameter.</p>				

M13 – DIGITAL INPUTS (INPn, n=1...12)		UdM	Default	Range															
P13.n.01	Input function		OFF	OFF-ON-LOCK-SYNC-TARA-TAR-B-Cxx															
P13.n.02	Channel number (x)		1	1-40															
P13.n.03	Contact type		NO	NO-NC															
P13.n.04	Rising delay	s	0.05	0.00 – 300.00															
P13.n.05	Falling delay	s	0.05	0.00 – 300.00															
<p>P13.n.01 – Input function. OFF: input disabled. ON: input enabled, used as a source for other functions. LOCK: settings lock that prevents access to commands and parameters. SYNC: synchronism for power integration. TAR-A, TAR-B: energy tariff selection in binary combination. The tariff is changed immediately when the input configuration changes; if a SYNC input is also programmed, then the tariff change occurs when the SYNC command arrives.</p> <table border="1"> <thead> <tr> <th>TAR-A</th> <th>TAR-B</th> <th>Selected tariff</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>1</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>2</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>3</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>4</td> </tr> </tbody> </table> <p>Cxx – When the input is activated, the corresponding command from the commands menu is executed on the rising edge (applied to C1...C7, C16, C17). P13.n.02 – Channel number x referred to the previous parameter. P13.n.03 – Type of input contact: reverse the activation logic. P13.n.04, P13.n.05 – Delays in activating and deactivating the input in order to filter the state to avoid bounces.</p>					TAR-A	TAR-B	Selected tariff	OFF	OFF	1	OFF	ON	2	ON	OFF	3	ON	ON	4
TAR-A	TAR-B	Selected tariff																	
OFF	OFF	1																	
OFF	ON	2																	
ON	OFF	3																	
ON	ON	4																	

M14 – DIGITAL OUTPUTS (OUTn, n=1...12)		UdM	Default	Range
P14.n.01	Output function		OFF	OFF-ON-SEQ-LIMx-PLCx-ALAx-PULx-REMx-INPx-TIMx-GLOBAL ALARM-GLOBAL WARNING
P14.n.02	Channel number (x)		1	1-40
P14.n.03	Output type		NOR	NOR-REV
<p>P14.n.01 – Output function: OFF: output disabled. ON: output always enabled. SEQ: output activated in case of wrong phase sequence. LIMx – PLCx – ALAx – PULx – REMx – INPx – TIMx: output linked to the status of the programmed variable. The status is available at an output. GLOBAL ALARM – GLOBAL WARNING: OR of priority alarms (alarm) and non-priority alarms (warning). P14.n.02 – Channel number (x) referred to the previous parameter. P14.n.03 – Reverse the operating logic of the output.</p>				

M15 – ANALOG INPUTS (AINn, n=1...6)		UdM	Default	Range
P15.n.01	Input type		OFF	OFF 0...20mA 4...20mA 0...0V -5V...+5V PT100
P15.n.02	Starting scale value		0	-9999 – +9999
P15.n.03	Multiplier		x1	/100 /10 x1 x10 x100 x1k
P15.n.04	Full scale value		100	-9999 – +9999
P15.n.05	Multiplier		x1	/100 /10 x1 x10 x100 x1k

P10.n.03	乘数		1	1-1000
P10.n.04	除数		1	1-1000
P10.n.05	描述		CNTn	(16 个字符自由文本)
P10.n.06	单位		Umn	(6 个字符自由文本)
P10.n.07	计数复位来源		OFF	OFF-ON-INPx-LIMx-PLCx-ALAx
P10.n.08	信道编号 (x)		1	1-40
<p>P10.n.01 – 导致计数增加 (上升沿) 的信号。这可以是万用表通电 (ON)、外部输入激活 (INPx)、超过阈值 (LIMx)、逻辑条件 (PLCx) 或报警 (ALAx)。 P10.n.02 – 参考前一个参数的信道编号 (x)。 P10.n.03 – 乘数 K。在显示前, 计数的脉冲会乘以该值。 P10.n.04 – 除数 K。在显示前, 计数的脉冲会除以该值。如果不是 1, 计数器会保留 2 位小数。 P10.n.07 – 导致计数器复位的信号。该信号激活后, 计数保持为零。 P10.n.08 – 参考前一个参数的信道编号 (x)。</p>				

M11 – 脉冲 (PULn, n=1...5)	度量单位	默认值	范围
P11.n.01	来源测量值		kWh+ kWh- kvarh+ kvarh- kVAh
P11.n.02	每 k-unit-h 的脉冲数		1000
P11.n.03	脉冲持续时间	sec	0.1
P11.n.04	CT 位置		Secondary
<p>P11.n.01 – 脉冲连接的电能类型。 P11.n.02 – 每 kWh、kvarh、kVAh 的脉冲数。 P11.n.03 – 脉冲持续时间。 P11.n.04 – 指示脉冲计数是否参考 CT 一次或二次电能值。</p>			

M12 – LED (LEDn, n=1...3)		度量单位	默认值	范围
P12.n.01	LED 功能		n=1: ON n=2: COM n=3: ALA	OFF-ON-LIMx-INPx-OUTx-REMx-PLCx-ALAx-COM-PULx-GLOBAL ALARM-GLOBAL WARNING
P12.n.02	信道编号 (x)		1	1-40
P12.n.03	LED 闪烁		OFF	OFF-ON-LIMx-INPx-OUTx-REMx-PLCx-ALAx-COM-PULx-GLOBAL ALARM-GLOBAL WARNING
P12.n.04	信道编号 (x)		1	1-40
<p>P12.n.01 – 与 LED 相关的功能。 P12.n.02 – 参考前一个参数的信道编号 (x)。 P12.n.03 – 导致 LED 闪烁的功能。此功能的优先级高于 P12.n.01。 P12.n.04 – 参考前一个参数的信道编号 (x)。</p>				

M13 – 数字输入 (INPn, n=1...12)		度量单位	默认值	范围
P13.n.01	输入功能		OFF	OFF – ON – LOCK – SYNC – TAR-A – TAR-B – Cxx
P13.n.02	信道编号 (x)		1	1-40
P13.n.03	触点类型		NO	NO-NC
P13.n.04	上升延迟	s	0.05	0.00 – 300.00
P13.n.05	下降延迟	s	0.05	0.00 – 300.00

M13 – 数字输入 (INPn, n=1...12)		度量单位	默认值	范围															
<p>P13.n.01 – 输入功能。 OFF: 禁用输入。 ON: 启用输入, 用作其他功能的来源。 LOCK: 设置锁定, 以防止访问命令和参数。 SYNC: 同步功率积分。 TAR-A, TAR-B: 在二进制组合中选择电能费率。当输入配置更改时, 费率会立即改变; 如果还编程了 SYNC 输入, 那么费率会在 SYNC 命令到达时发生改变。</p> <table border="1"> <thead> <tr> <th>TAR-A</th> <th>TAR-B</th> <th>所选费率</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>1</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>2</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>3</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>4</td> </tr> </tbody> </table>					TAR-A	TAR-B	所选费率	OFF	OFF	1	OFF	ON	2	ON	OFF	3	ON	ON	4
TAR-A	TAR-B	所选费率																	
OFF	OFF	1																	
OFF	ON	2																	
ON	OFF	3																	
ON	ON	4																	

<p>Cxx – 当输入被激活时, 在上升沿执行命令菜单中的相应命令 (应用于 C1...C7、C16、C17)。 P13.n.02 – 参考前一个参数的信道编号 x。 P13.n.03 – 输入触点的类型: 反转激活逻辑。 P13.n.04, P13.n.05 – 激活和停用输入延迟, 以便筛选状态, 避免反弹。</p>				
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M14 – 数字输出 (OUTn, n=1...12)		度量单位	默认值	范围
P14.n.01	输出功能		OFF	OFF-ON-SEQ-LIMx-PLCx-ALAx-PULx-REMx-INPx-TIMx-GLOBAL ALARM-GLOBAL WARNING
P14.n.02	信道编号 (x)		1	1-40
P14.n.03	输出类型		NOR	NOR-REV
<p>P14.n.01 – 输出功能: OFF: 禁用输出。 ON: 始终启用输出。</p>				

P15.n.06	Description		AINn	(16 characters free text)
P15.n.07	Unit		UMn	(6 characters free text)

P15.n.01 – Specifies the type of sensor connected to the analog input. Depending on the type selected, the sensor must be connected to the appropriate terminal. See expansion module manual.
P15.n.02, P15.n.03 – They define the value to be displayed when the sensor signal is at a minimum, i.e. at the beginning of the range defined by the type of sensor.
 When the sensor is of the PT100 type, these parameters define a constant that is added to the temperature measurement, in the unit of measurement defined by P15.n.07. This feature can be used to compensate for reading errors due to cable length.
P15.n.04, P15.n.05 – These define the value to be displayed when the sensor signal is at maximum, i.e. at the full scale of the range defined by the sensor type. These parameters are not used when the sensor is of the PT100 type.
P15.n.06 – Description of the analog input.
P15.n.07 – Unit of the analog input. If a PT100 type sensor is used and this description is equal to °F, then the measured temperature will be converted to degrees Fahrenheit, otherwise it will be degrees Celsius.

M16 – ANALOG OUTPUTS (AOUn, n=1...6)			
	UdM	Default	Range
P16.n.01	Output type	OFF	OFF 0...20mA 4...20mA 0...0V -5V...+5V PT100
P16.n.02	Reference measure	OFF	OFF- (measures)
P16.n.03	Source	MAIN	MAIN BRN01...32
P16.n.04	Load number	TOT	TOT-1-2-3
P16.n.05	Channel	1	1-40
P16.n.06	Starting scale value	0	-9999 – +9999
P16.n.07	Multiplier	x1	/100 /10 x1 x10 x100 x1k x10k
P16.n.08	Full scale value	0	-9999 – +9999
P16.n.09	Multiplier	x1	/100 /10 x1 x10 x100 x1k x10k

P16.n.01 – Specifies the type of analog output signal. Depending on the type selected, the connection must be made on the appropriate terminal. See expansion module manual.
P16.n.02 – Electrical quantity on which the analog output value depends.
P16.n.03 – Source from which the measurement is taken. MAIN is the main multimeter, while BRNx are the measurement points of the EASY BRANCH system in sequence as they are recognized by the main multimeter.
P16.n.04 – Each source is three-phase. By this parameter the load is selected, that is if L1, L2, L3 or total.
P16.n.05 – Channel number referred to parameter P16.n.02.
P16.n.06, P16.n.07 – They define the value of the electrical quantity which corresponds to an output value at the minimum of the range defined by the type of sensor.
P16.n.08 and P16.n.09 – They define the value of the electrical quantity that corresponds to the maximum of the range defined by the type of sensor.

M17 – USER PAGES (PAGn, n=1...4)			
	UdM	Default	Range
P17.n.01	Enabling	OFF	OFF-ON
P17.n.02	Title	PAGn	(16 characters free text)
P17.n.03	Measure 1	OFF	OFF- (measures)
P17.n.04	Measure 2	OFF	OFF- (measures)
P17.n.05	Measure 3	OFF	OFF- (measures)
P17.n.06	Measure 4	OFF	OFF- (measures)
P17.n.07	Measure 5	OFF	OFF- (measures)
P17.n.08	Measure 6	OFF	OFF- (measures)
P17.n.09	Measure 7	OFF	OFF- (measures)
P17.n.10	Measure 8	OFF	OFF- (measures)
P17.n.11	Measure 9	OFF	OFF- (measures)

P17.n.01 – Enabling the page to view it.
P17.n.02 – Title assigned to the page.
P17.n.03... P17.n.11 – Selection of the measures to include in the page up to a maximum of 9.

M18 – TIMER (TIMn, n=1...8)			
	UdM	Default	Range
P18.n.01	Timer source	OFF	OFF-ON-INPx-OUTx-LIMx-REMx-PLCx-ALAx
P18.n.02	Channel number (x)	1	1-40
P18.n.03	Delay	sec	0

P18.n.01 – Source that activates the timer. If the variable is deactivated, the timer is reset.
P18.n.02 – Channel number (x) referred to the previous parameter.
P18.n.03 – Time after which the TIMn variable is activated.

M19 – ENERGY QUALITY (DMG9000 only)			
	UdM	Default	Range
P19.01	Energy quality enabling	OFF	OFF-ON
P19.02	Average voltage threshold [NLO]	%Un	85.0
P19.03	Average voltage threshold [VLO]	%Un	90.0
P19.04	Average voltage threshold [VHI]	%Un	110.0
P19.05	Average voltage threshold [NHI]	%Un	115.0
P19.06	Voltage harmonics control	HARM	OFF-THD-HARM

SEQ: 相序错误时激活输出。
LIMx – PLCx – ALAx – PULx – REMx – INPx – TIMx: 连接至已编程变量状态的输出。该状态在输出中可用。
GLOBAL ALARM – GLOBAL WARNING: 优先报警 (报警) 和非优先报警 (警告)。
P14.n.02 – 参考前一个参数的信道编号 (x)。
P14.n.03 – 反转输出的工作逻辑。

M15 – 模拟输入 (AINn, n=1...6)		度量单位	默认值	范围
P15.n.01	输入类型		OFF	OFF 0...20mA 4...20mA 0...0V -5V...+5V PT100
P15.n.02	初始标度值		0	-9999 – +9999
P15.n.03	乘数因子		x1	/100 /10 x1 x10 x100 x1k
P15.n.04	全标度值		100	-9999 – +9999
P15.n.05	乘数因子		x1	/100 /10 x1 x10 x100 x1k
P15.n.06	描述		AINn	(16 个字符自由文本)
P15.n.07	单位		UMn	(6 个字符的自由文本)

P15.n.01 – 指定连接模拟输入的传感器类型。根据所选类型, 传感器必须连接到正确的端子。请参见扩展模块手册。
P15.n.02, P15.n.03 – 定义当传感器信号处于最小值时 (即在传感器类型所定义范围的开端) 要显示的值。
 当传感器为 PT100 类型时, 这些参数定义了一个添加到温度测量值中的常数, 度量单位由 P15.n.07 定义。该功能可用于补偿由于电缆长度引起的读数误差。
P15.n.04, P15.n.05 – 定义当传感器信号处于最大值时 (即在传感器类型所定义范围的全标度上) 要显示的值。当传感器为 PT100 类型时, 不使用这些参数。
P15.n.06 – 模拟输入的描述。
P15.n.07 – 模拟输入的单位。如果使用 PT100 类型的传感器, 且此描述等于 °F, 则测得的温度将被换算成华氏度, 否则将使用摄氏度。

M16 – 模拟输出 (AOUn, n=1...6)		度量单位	默认值	范围
P16.n.01	输出类型		OFF	OFF 0...20mA 4...20mA 0...0V -5V...+5V
P16.n.02	参考测量值		OFF	OFF- (测量值)
P16.n.03	来源		MAIN	MAIN BRN01...32
P16.n.04	负载编号		TOT	TOT-1-2-3
P16.n.05	信道		1	1-40
P16.n.06	初始标度值		0	-9999 – +9999
P16.n.07	乘数因子		x1	/100 /10 x1 x10 x100 x1k x10k
P16.n.08	全标度值		0	-9999 – +9999
P16.n.09	乘数因子		x1	/100 /10 x1 x10 x100 x1k x10k

P16.n.01 – 指定模拟输出信号的类型。根据所选类型, 必须连接到正确的端子。请参见扩展模块手册。
P16.n.02 – 模拟输出值依据的电量。
P16.n.03 – 采集测量值的来源。MAIN 为主万用表, 而 BRNx 为 易回路系统的测量点, 按主万用表识别的顺序排列。
P16.n.04 – 每个来源为三相。通过此参数可选择负载, 即 L1、L2、L3 或总计。
P16.n.05 – 参考参数 P16.n.02 的信道编号。
P16.n.06, P16.n.07 – 定义电量值, 该值对应于由传感器类型所定义范围下限的输出值。
P16.n.08, P16.n.09 – 定义电量值, 该值对应于由传感器类型所定义范围上限的输出值。

M17 – 用户页面 (PAGn, n=1...4)		度量单位	默认值	范围
P17.n.01	启用		OFF	OFF-ON
P17.n.02	标题		PAGn	(16 个字符自由)

P19.07	Average THDV threshold	%	8	1-50
P19.08	Asymmetry threshold	%	2.0	OFF / 1-50
P19.09	Average frequency threshold [NLO]	%	94.0	OFF / 80-100
P19.10	Average frequency threshold [FLO]	%	99.0	OFF / 80-100
P19.11	Average frequency threshold [FHI]	%	101.0	OFF / 100-120
P19.12	Average frequency threshold [NHI]	%	104.0	OFF / 100-120
P19.13	DIP threshold	%Un	90.0	OFF / 5-100
P19.14	SWELL threshold	%Un	110.0	OFF / 100-150
P19.15	DIP/SWELL hysteresis	%	2.0	0-10.0
P19.16	Waveform capture on DIP/SWELL		OFF	OFF-ON
P19.17	Interruption threshold	%Un	5.0	OFF / 0.1-10.0
P19.18	Interruption hysteresis	%Un	1.0	0-10.0
P19.19	Waveform capture on interruption		OFF	OFF-ON

P19.01 – Global enabling of the energy quality control function.
P19.02, P19.05 – Extreme thresholds applied to the integrated voltage, for the generation of NHI and NLO events, with an increase in the relative counters.
P19.03, P19.04 – Voltage thresholds for the generation of VLO and VHI events and weekly, monthly and annual energy quality percentages.
P19.06 – Harmonic distortion quality control mode.
OFF: disabled.
THD: control based on THD, with threshold adjustable via P19.07.
HAR: control based on the percentage of the single voltage harmonics, from the 2nd to the 25th order, with thresholds defined as per the EN50160 standard.
P19.07 – Total harmonic distortion (THD) threshold for the generation of THD events and weekly, monthly and annual energy quality percentage count.
P19.08 – Voltage asymmetry threshold for generating asymmetry events and counting the weekly, monthly and annual energy quality percentages.
P19.09, P19.12 – Extreme thresholds applied to the integrated frequency, for the generation of NHI and NLO events, with an increase in the relative counters.
P19.10, P19.11 – Frequency thresholds for the generation of FLO and FHI events and weekly, monthly and annual energy quality percentages.
P19.13 – Threshold for generation of DIP event (fast voltage drops).
P19.14 – Threshold for generating the SWELL event (fast voltage rises).
P19.15 – Hysteresis for the previous two thresholds.
P19.16 – Enables the capture of the waveform on DIP or SWELL event.
P19.17 – Threshold for generating interruption event.
P19.18 – Hysteresis for the previous threshold.
P19.19 – Enables the capture of the waveform on an interruption event.

M20 – EASY BRANCH (BRNn, n=1...32)		UdM	Default	Range
P20.n.01	Load type		3ph	OFF 3ph 3x1ph 1ph
P20.n.02	CT primary (I1-I2-I3)	A	5	1-10000
P20.n.03	CT secondary (I1-I2-I3)	A	5	1/5
P20.n.04	Voltage source		L1-L2-L3	L1-L2-L3 L1-L1-L1 L2-L2-L2 L3-L3-L3
P20.n.05	Modbus address		n+1	2-254
P20.n.06	Accumulator number		OFF	OFF / 1-8

P20.n.01 – Type of load associated with the measuring point.
OFF: input disabled
3ph: the three current inputs measure a three-phase load
3x1ph: the three current inputs measure three single-phase loads, one for each phase. For the choice of the reference voltage, see P20.n.04.
1ph: only one of the three current inputs (I1) is connected and measures a single-phase load.
P20.n.02 – Rated current of the CT primary.
P20.n.03 – CT secondary current.
P20.n.04 – Voltage source to which the loads are connected, in the case of P20.n.01 = 3x1ph or 1ph.
L1-L2-L3: valid for the 3x1ph case, I1 is associated with L1, I2 with L2 and I3 with L3
L1-L1-L1: I1, I2, I3 use L1 as the reference voltage
L2-L2-L2: I1, I2, I3 use L2 as the reference voltage
L3-L3-L3: I1, I2, I3 use L3 as the reference voltage.
P20.n.05 – Modbus node associated with the measurement point for reading from remote software. The data network must be connected to the main multimeter to which the EASY BRANCH system is connected: through this, the remote software queries the various measuring points as if they were independent multimeters, each with its own modbus node.
P20.n.06 – Association of the measuring point to a virtual sum point: total and partial active energy and active power are added. The values are available on the EASY BRANCH page, they can be used in the limit thresholds and are readable via modbus.

P17.n.03	测量值 1			文本)
P17.n.04	测量值 2		OFF	OFF- (测量值)
P17.n.05	测量值 3		OFF	OFF- (measures)
P17.n.06	测量值 4		OFF	OFF- (measures)
P17.n.07	测量值 5		OFF	OFF- (measures)
P17.n.08	测量值 6		OFF	OFF- (measures)
P17.n.09	测量值 7		OFF	OFF- (measures)
P17.n.10	测量值 8		OFF	OFF- (measures)
P17.n.11	测量值 9		OFF	OFF- (measures)

P17.n.01 – 启用该页面进行查看。
P17.n.02 – 分配给该页面的标题。
P17.n.03...P18.n.11 – 选择该页面中要包括的测量值, 最多 9 个。

M18 – 定时器 (TIMn, n=1...8)	度量单位	默认值	范围
P18.n.01	定时器来源	OFF	OFF-ON -INPx-OUTx- LIMx-REMX-PLCx-ALAx
P18.n.02	信道编号 (x)	1	1-40
P18.n.03	延迟	sec 0	0.0-6000.0

P18.n.01 – 激活定时器的来源。如果变量被停用, 则定时器复位。
P18.n.02 – 参考前一个参数的信道编号 (x)。
P18.n.03 – 在此时间后 TIMn 变量被激活。

M19 – 电能质量 (仅限 DMG9000)	度量单位	默认值	范围
P19.01	启用电能质量	OFF	OFF-ON
P19.02	平均电压阈值 [NLO]	%Un	85.0 OFF / 50-100
P19.03	平均电压阈值 [VLO]	%Un	90.0 OFF / 50-100
P19.04	平均电压阈值 [VHI]	%Un	110.0 OFF / 100-150
P19.05	平均电压阈值 [NHI]	%Un	115.0 OFF / 100-150
P19.06	电压谐波控制	HARM	OFF-THD-HARM
P19.07	平均 THDV 阈值	%	8 1-50
P19.08	不对称阈值	%	2.0 OFF / 1-50
P19.09	平均频率阈值 [NLO]	%	94.0 OFF / 80-100
P19.10	平均频率阈值 [FLO]	%	99.0 OFF / 80-100
P19.11	平均频率阈值 [FHI]	%	101.0 OFF / 100-120
P19.12	平均频率阈值 [NHI]	%	104.0 OFF / 100-120
P19.13	DIP 阈值	%Un	90.0 OFF / 5-100
P19.14	SWELL 阈值	%Un	110.0 OFF / 100-150
P19.15	DIP/SWELL 滞后	%	2.0 0-10.0
P19.16	DIP/SWELL 波形捕捉		OFF OFF-ON
P19.17	中断阈值	%Un	5.0 OFF / 0.1-10.0
P19.18	中断滞后	%Un	1.0 0-10.0
P19.19	中断时捕捉波形		OFF OFF-ON

P19.01 – 全局启用电能质量控制功能。
P19.02, 19.05 – 应用于积分电压的极端阈值, 用于产生 NHI 和 NLO 事件, 相应计数器增加。
P19.03, P19.04 – 电压阈值, 用于产生 VLO 和 VHI 事件以及每周、每月和每年电能质量百分比。
P19.06 – 谐波失真质量控制模式。
OFF: 禁用。
THD: 基于 THD 的控制, 通过 P19.07 调整阈值。
HAR: 基于单次电压谐波百分比的控制, 从 2 次到 25 次, 阈值根据 EN50160 标准定义。
P19.07 – 总谐波失真 (THD) 阈值, 用于产生 THD 事件并计算每周、每月和每年电能质量百分比。
P19.08 – 电压不对称阈值, 用于产生不对称事件并计算每周、每月和每年的电能质量百分比。
P19.09, P19.12 – 应用于积分频率的极端阈值, 用于产生 NHI 和 NLO 事件, 相应计数器增加。
P19.10, P19.11 – 频率阈值, 用于产生 FLO 和 FHI 事件以及每周、每月和每年电能质量百分比。
P19.13 – 用于产生 DIP 事件 (电压骤降) 的阈值。
P19.14 – 用于产生 SWELL 事件 (电压骤升) 的阈值。
P19.15 – 前两个阈值滞后。
P19.16 – 启用在发生 DIP 或 SWELL 事件时捕捉波形。
P19.17 – 用于产生中断事件的阈值。
P19.18 – 前一个阈值滞后。
P19.19 – 启用在发生中断事件时捕捉波形。

M20 – 易回路 EASY BRANCH (BRNn, n=1...32)	度量单位	默认值	范围
P20.n.01	负载类型	3ph	OFF 3ph 3x1ph 1ph
P20.n.02	CT 一次电流 (I1-I2-I3)	A	5 1-10000
P20.n.03	CT 二次电流 (I1-I2-I3)	A	5 1/5
P20.n.04	电压来源		L1-L2-L3 L1-L1-L1 L2-L2-L2 L3-L3-L3
P20.n.05	Modbus 地址		n+1 2-254

PARAMETER SETUP WITH NFC

Thanks to NFC technology, it is possible to configure and modify parameters (even when the power analyzer is not powered) through the LOVATO NFC App which can be downloaded for free from the Google Play Store and App Store for Android and iOS smart devices. The same menus and parameters available on the display are presented and it is possible to save the configuration file compatible with the built-in web server and with the Xpress configuration software.

INFRARED OPTICAL PORT

The optical port on the back of the power analyzer is compatible with CX01 and CX02 communication devices.

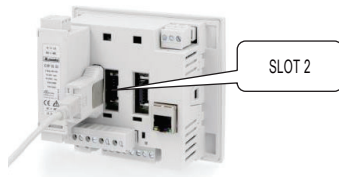
With CX01 it is possible to connect with the Xpress software (freely downloadable at www.lovatoelectric.com web site) for:

- the configuration of the parameters;
- electrical network diagnostics;
- firmware update of the power analyzer.

With CX02 it is possible to connect with the LOVATO Electric SAM1 app that can be downloaded for free from the Google Play Store and App Store for Android and iOS smart devices for:

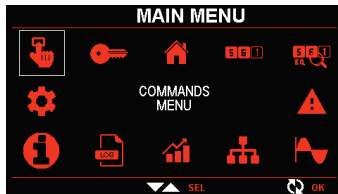
- the configuration of the parameters;
- electrical network diagnostics;
- the clone of the data memory, for example to transfer the values of the energy meters from one DMG to another.

The optical port is located under the cover of the second expansion slot.



COMMANDS

Starting from the measurement reading pages, press the \equiv button to access the menu and then select the "command" icon to access the commands list. If the icon is gray, the password is required



The list of available commands is displayed.

COMMAND	ACCESS LEVEL	DESCRIPTION
C01	User/Advanced	Reset MAX-MIN
C02	User/Advanced	Reset MAX demand
C03	User/Advanced	Reset partial and tariff energy counters
C04	User/Advanced	Reset partial hour counters
C05	User/Advanced	Reset counters
C06	User/Advanced	Reset alarms
C07	User/Advanced	Reset limit thresholds
C08	Advanced	Reset total energy counters
C09	Advanced	Setup to default
C10	Advanced	Backup of the setup
C11	Advanced	Restore the setup backup
C12	Advanced	Wiring test
C13	Advanced	Reset event list
C14	Advanced	Force output status
C15	Advanced	Delete PLC program
C16	User/Advanced	Reset energy quality counters (DMG9000)
C17	User/Advanced	Reset energy quality statistics (DMG9000)

- Keys \blacktriangle \blacktriangledown : move the selection to the different command items;
- Key \circ : confirms the selection;
- Key \equiv : exit command menu.

P20.n.06	累加器编号	OFF	OFF / 1-8
<p>P20.n.01 — 与测量点相关联的负载类型。 OFF: 禁用输入 3ph: 三个电流输入测量三相负载 3x1ph: 三个电流输入测量三个单相负载，每个相位一个。要选择参考电压，请参见 P20.n.04。 1ph: 仅连接三个电流输入中的一个 (I1)，并测量单相负载。 P20.n.02 — CT 一次额定电流。 P20.n.03 — CT 二次电流。 P20.n.04 — 在 P20.n.01 = 3x1ph 或 1ph 的情况下，负载连接到的电压来源。 L1 - L2 - L3: 对 3x1ph 有效，I1 与 L1 相关联，I2 与 L2 相关联，I3 与 L3 相关联 L1 - L1 - L1: I1、I2、I3 将 L1 用作参考电压 L2 - L2 - L2: I1、I2、I3 将 L2 用作参考电压 L3 - L3 - L3: I1、I2、I3 将 L3 用作参考电压 P20.n.05 — 与测量点相关联的 Modbus 节点，用于从远程软件读取数据。数据网络必须连接到易回路系统所连接的主万用表，以便远程软件可查询各个测量点，就像它们是独立的万用表一样，每个都有自己的 Modbus 节点。 P20.n.06 — 测量点与虚拟累加点相关联：添加总计和分计有功电能和有功功率。这些值在易回路页面上提供，可用于门限，并且可通过 Modbus 读取。</p>			

通过 NFC 设置参数

得益于 NFC 技术，可通过 LOVATO NFC 应用来配置和修改参数（即使在电力分析仪未通电的情况下），该应用可从 Google Play 商店和 App Store 免费下载，适用于 Android 和 iOS 智能设备。应用显示相同的菜单和参数，并且可保存与内置网络服务器和 Xpress 配置软件兼容的配置文件。

红外光学端口

电力分析仪背面的光学端口与 CX01 和 CX02 通讯设备兼容。

通过 CX01 可与 Xpress 软件（可在 www.lovatoelectric.com 或 www.lovatoelectric.cn 网站上免费下载）连接，

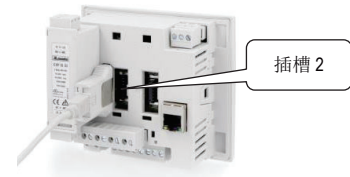
可用于：

- 配置参数；
- 诊断电网；
- 对电力分析仪进行固件更新。

通过 CX02 可与 LOVATO Electric SAM1 应用连接，该应用可从 Google Play 商店和 App Store 免费下载，适用于 Android 和 iOS 智能设备。

- 配置参数；
- 诊断电网；
- 克隆数据存储，例如将电能表的值从一台 DMG 传输到另一台。

光学端口位于第二个扩展插槽盖下方。



命令

从测量值读数页面开始，按 \equiv 按钮访问菜单，然后选择“命令”按钮访问命令列表。如果图



显示可用命令列表。

命令	访问级别	描述
C01	用户/高级	复位最大和最小值
C02	用户/高级	复位最大需求
C03	用户/高级	复位分计和费率电能计数器
C04	用户/高级	复位分计计时器
C05	用户/高级	复位计数器
C06	用户/高级	复位报警
C07	用户/高级	复位门限
C08	高级	复位总计电能计数器
C09	高级	设置为默认值
C10	高级	备份设置
C11	高级	恢复设置备份
C12	高级	接线测试
C13	高级	复位事件列表
C14	高级	强制输出状态
C15	高级	删除 PLC 程序
C16	用户/高级	复位电能质量计数器 (DMG9000)
C17	用户/高级	复位电能质量统计 (DMG9000)

- \blacktriangle \blacktriangledown 键：将选择移动到不同的命令项；
- \circ 键：确认选择。
- \equiv 键：退出命令菜单。

WIRING TEST

The connection test checks if the power analyzer has been correctly installed.

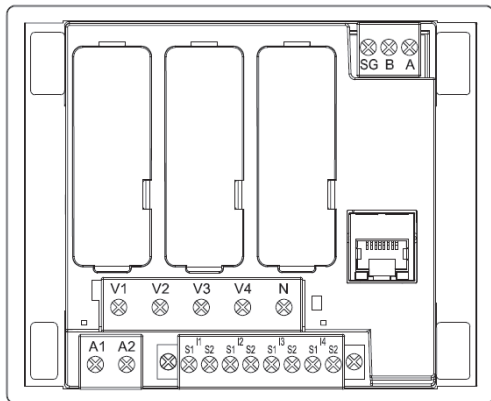
The test can be performed in the following conditions:

- three-phase system with all phases present ($V > 50V \sim L-N$);
- minimum current flowing on each phase $> 1\%$ of the CT full scale set;
- positive energy direction (the load absorbs energy from the utility);
- $\cos\phi > 0.5$ Inductive.

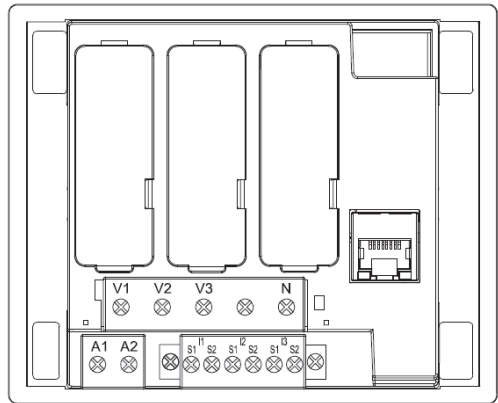
The test checks the following points:

- reading of the three voltages;
- phase sequence;
- voltage asymmetry;
- inversion of the polarity of one or more CTs;
- non-correspondence of phases between voltages/currents.

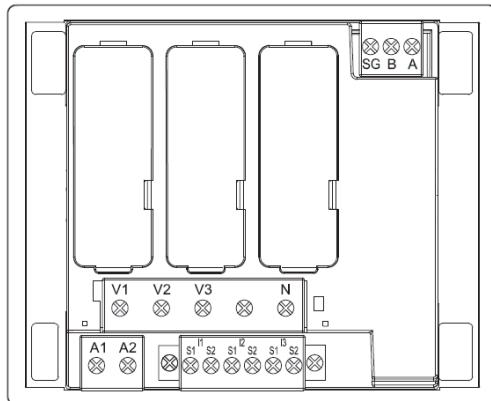
MECHANICAL DIMENSIONS AND TERMINALS POSITION



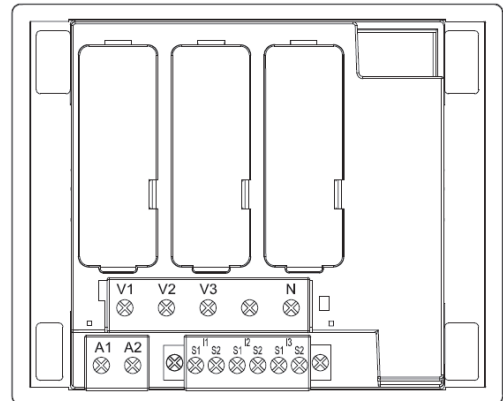
DMG9000



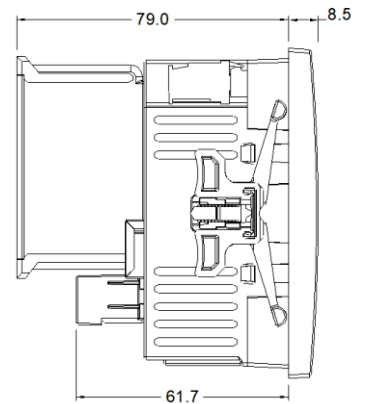
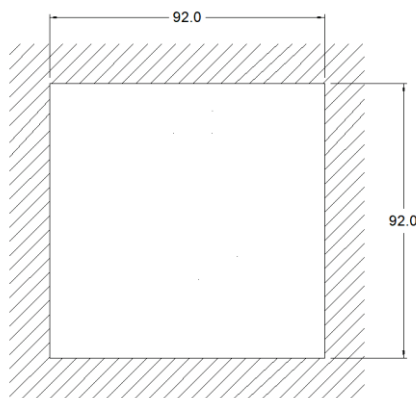
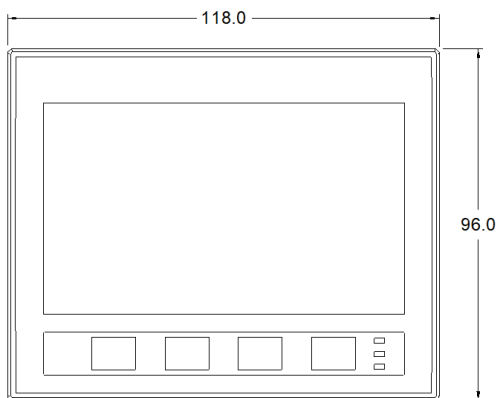
DMG8000



DMG7500



DMG7000



接线测试

连接测试用于核实电力分析仪是否正确安装。

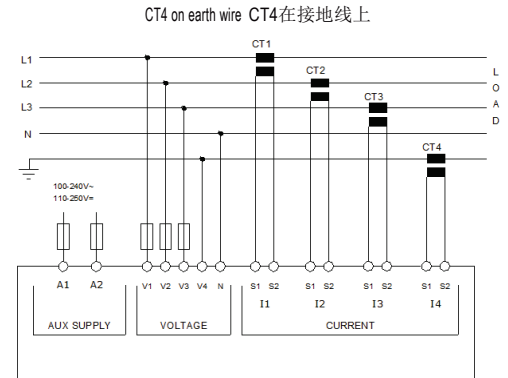
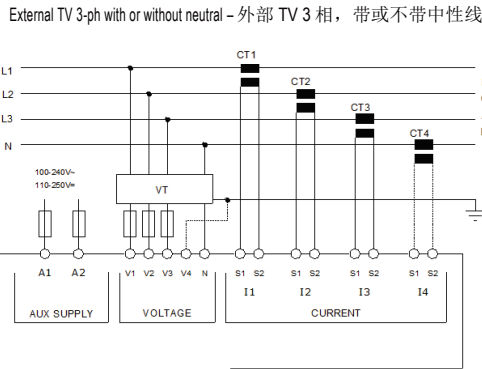
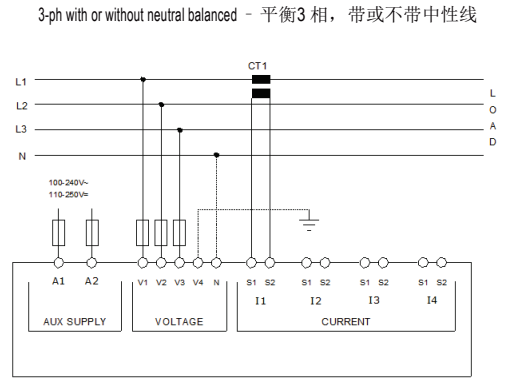
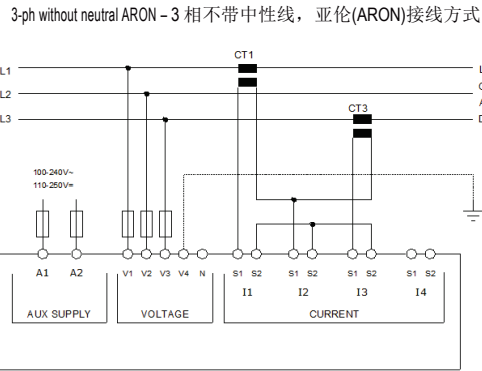
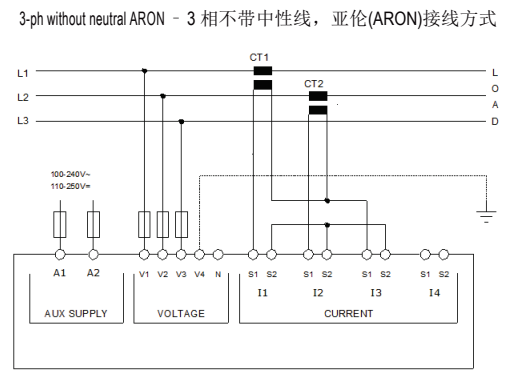
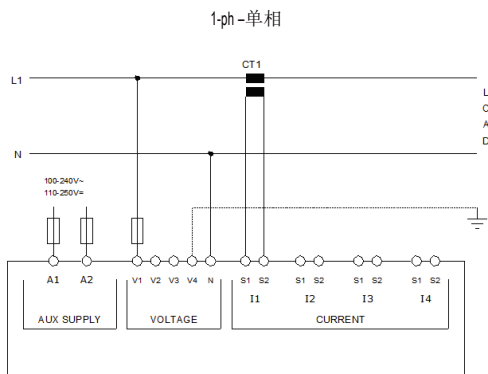
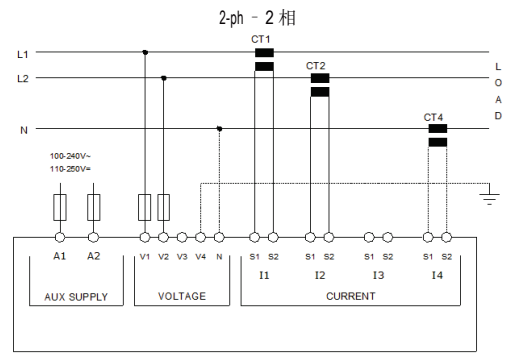
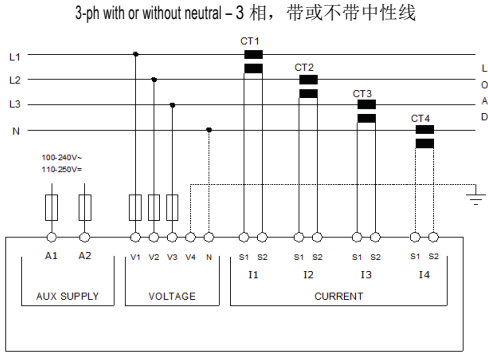
测试可在以下条件下执行：

- 三相系统且各相均存在 ($V > 50V \sim L-N$)；
- 流入各相的最小电流 $> CT$ 全标度设置的 1%；
- 正向电能（负载从市电吸收电能）；
- $\cos\phi > 0.5$ 电感性。

此测试用于核实以下几点：

- 三个电压的读数；
- 相序；
- 电压不对称；
- 一个或多个 CT 的极性反转；
- 电压/电流之间的相位不对等。

机械尺寸和端子位置



TECHNICAL CHARACTERISTICS		技术特性	
Auxiliary power supply		辅助电源	
Rated voltage Us	100 - 240 V~ 110 - 250 V~	额定电压 Us	100 - 240 V~ 110 - 250 V~
Operating voltage range	90 - 264 V~ 100 - 300 V~	工作电压范围	90 - 264 V~ 100 - 300 V~
Frequency	45 - 66 Hz	频率	45 - 66 Hz
Power consumption/dissipation	15 VA - 6 W	功耗	15 VA - 6 W
Immunity time for microbreakings	50 ms	掉电保持	50 ms
Voltage inputs		电压输入	
Input type (DMG7000 - DMG7500 - DMG8000)	3-phase + neutral	输入类型 (DMG7000 - DMG7500 - DMG8000)	3相 + 中性线
Input type (DMG9000)	3-phase + neutral + earth	输入类型 (DMG9000)	3相 + 中性线 + 接地线
Rated voltage Ue max	600V~ phase - phase 347V~ phase - neutral	额定电压 Ue 最大值	600V~ 线电压 347V~ 相电压
Measurement range	40 - 830V~ phase - phase 5 - 480V~ phase - neutral	测量范围	40 - 830V~ 相间 5 - 480V~ 相对中性线
Frequency range	45 - 66Hz	频率范围	45 - 66 Hz
Measurement mode	True root mean square (TRMS)	测量模式	真均方根 (TRMS)
Current inputs		电流输入	
Rated current Ie	5A~ / 1A~	额定电流 Ie	5A~ / 1A~
Measurement range	0.004 - 6A~	测量范围	0.004 - 6A~
Input type	Internal CT	输入类型	内部 CT
Measurement mode	True root mean square (TRMS)	测量模式	真均方根 (TRMS)
Overload capacity	1.2 Ie	过载容量	1.2 Ie
Overload peak	120A x 0.5s	过载峰值	120A x 0.5s
Burden (per phase)	0.6 VA	负荷 (各相)	0.6 VA
Measurement accuracy		测量精度	
Reference temperature	+23°C ± 2°C	参考温度	+23° C ± 2° C
Phase - neutral voltage	Class 0.2 (IEC/EN 61557-12), V: 50 - 480 V~	相电压	0.2级 (IEC/EN 61557-12), V: 50 - 480 V~
Phase - phase voltage	Class 0.2 (IEC/EN 61557-12), V: 87 - 830 V~	线电压	0.2级 (IEC/EN 61557-12), V: 87 - 830 V~
Current	Class 0.2 (IEC/EN 61557-12), In: 5 A~	电流	0.2级 (IEC/EN 61557-12), 输入: 5 A~
Active power	Class 0.5 (IEC/EN 61557-12)	有功功率	0.5级 (IEC/EN 61557-12)
Reactive power	Class 1 (IEC/EN 61557-12)	无功功率	1级 (IEC/EN 61557-12)
Active energy	Class 0.5s (IEC/EN 62053-22)	有功电能	0.5s级 (IEC/EN 62053-22)
Reactive energy	Class 1 (IEC/EN 62053-24)	无功电能	1级 (IEC/EN 62053-24)
Power factor	Class 0.5 (IEC/EN 61557-12)	功率因数	0.5级 (IEC/EN 61557-12)
Frequency	Class 0.02 (IEC/EN 61557-12)	频率	0.02级 (IEC/EN 61557-12)
THD V - I	Class 5 (IEC/EN 61557-12)	THD V - I	5级 (IEC/EN 61557-12)
Harmonics 2nd - 15th order	Class 5 (IEC/EN 61557-12)	2 - 15 次谐波	5级 (IEC/EN 61557-12)
Ambient conditions		环境条件	
Operating temperature	Min -20°C - Max +60°C	工作温度	最低 -20° C - 最高 +60° C
Storage temperature	Min -30°C - Max +80°C	储存温度	最低 -30° C - 最高 +80° C
Relative humidity	<80% (IEC/EN 60068-2-78)	相对湿度	<80% (IEC/EN 60068-2-78)
Maximum pollution degree	2	最大污染度	2
Measurement category	III	测量类别	III
Overvoltage category	3	过电压类别	3
Altitude	≤ 2000 m for > 2000m: VLN ≤ 300 V~, VLL ≤ 520 V~, Vaux ≤ 110 V~	海拔高度	≤ 2000 m 对于 > 2000 m: VLN ≤ 300 V~、 VLL ≤ 520 V~、Vaux ≤ 110 V~
Climatic sequence	Z/ABDM (IEC/EN 60068-2-61)	气候顺序	Z/ABDM (IEC/EN 60068-2-61)
Shock resistance	10g (IEC/EN 60068-2-27)	耐冲击性	10g (IEC/EN 60068-2-27)
Vibration resistance	0.7g (IEC/EN 60068-2-6)	抗振性	0.7g (IEC/EN 60068-2-6)
Insulation voltage		绝缘电压	
Rated insulation voltage Ui	600 V~	额定绝缘电压 Ui	600 V~
Rated impulse withstand voltage Uimp	9.6 kV	额定冲击耐受电压 Uimp	9.6 kV
Power frequency withstand voltage	5.4 kV	工频耐压	5.4 kV
Auxiliary supply and voltage input connections		辅助电源和电压输入连接	
Type of terminals	Screw (removable)	端子类型	螺丝端子 (可拆卸)
N° of terminals	2 for power supply 4 for voltage measurement DMG9000: 5 for voltage measurement	端子数量	2 个 (电源) 4 个 (电压测量) DMG9000: 5 个 (电压测量)
Conductor cross section (min and max)	0.2 - 2.5 mmq (24 - 12 AWG)	导线横截面 (最小和最大值)	0.2 - 2.5 mm² (24 - 12 AWG)
Tightening torque	0.5 Nm (4.5 lbin)	上紧扭矩	0.5 Nm (4.5 lbin)
Current input connections		电流输入连接	
Type of terminals	Screw (removable with safety screws)	端子类型	螺丝端子 (可拆卸, 安全螺丝端子)
N° of terminals	6 for external CT connection DMG9000: 8 for external CT connection	端子数量	6 个 (外部 CT 连接) DMG9000: 8 个 (外部 CT 连接)
Conductor cross section (min and max)	0.2 - 2.5 mmq (24 - 12 AWG)	导线横截面 (最小和最大值)	0.2 - 2.5 mm² (24 - 12 AWG)
Tightening torque	0.5 Nm (4.5 lbin)	上紧扭矩	0.5 Nm (4.5 lbin)
RS-485 port connection (DMG7500-DMG9000)		RS-485 端口连接 (DMG7500-DMG9000)	
Type of terminals	Screw (removable)	端子类型	螺丝端子 (可拆卸)
N° of terminals	3 (A-B-SG)	端子数量	3 (A-B-SG)
Conductor cross section (min and max)	0.2 - 2.5 mmq (24 - 12 AWG)	导线横截面 (最小和最大值)	0.2 - 2.5 mm² (24 - 12 AWG)
Tightening torque	0.5 Nm (4.5 lbin)	上紧扭矩	0.5 Nm (4.5 lbin)
Ethernet port connection (DMG8000-DMG9000)		以太网端口连接 (DMG8000-DMG9000)	
Type of connector	RJ45	接头类型	RJ45
Mode	10Base-T, 100Base-TX, Auto MDIX	模式	10Base-T、100Base-TX、Auto MDIX
Max cable length	100m TIA-EIA 568-5-A	最大电缆长度	100m TIA-EIA 568-5-A

Housing		外壳	
Material	Xantar RAL 7035	材质	Xantar RAL 7035
Type	Panel mount	类型	面板安装
Cut-out dimension	92 x 92 mm according to IEC61554	开孔尺寸	92 x 92 mm, 符合 IEC61554
Dimensions	118 x 96 x 62 mm – without expansion modules 118 x 96 x 79 mm – with EXP... expansion modules	尺寸	118 x 96 x 62 mm – 不带扩展模块 118 x 96 x 79 mm – 带 EXP... 扩展模块
Protection degree	IP65 frontal with gasket, IP20 housing and terminals	防护级别	IP65(前面板, 带密封圈) IP20 (外壳和端子)
Weight	Max 0.440 kg	重量	最大 0.440 kg
Certification and compliance		认证及合规性	
Certification	CE, UKCA, EAC	认证	CE, UKCA, EAC
Compliance	IEC/EN/BS 61010-1, IEC/EN/BS 61010-2-030 IEC/EN/BS 61000-6-2, IEC61000-6-4	合规性	IEC/EN/BS 61010-1、IEC/EN/BS 61010-2-030 IEC/EN/BS 61000-6-2、IEC61000-6-4