




Energy meters



 **Lovato**
electric
100% electricity

Energy meters

For efficient control of energy consumption

In a modern world in which energy must be monitored and controlled in the most efficient way possible, LOVATO Electric presents the new series of its energy meters for single and three-phase systems.

The compatibility with EXM... expansion modules and the availability of the data concentrator allow LOVATO Electric energy meters connectivity to the most common communication systems (USB, RS232, RS485 and Ethernet).

The need for optimising energy control in a number of sectors of industrial and civil activities.



Commercial buildings

Shopping centres, malls, supermarkets, restaurants, hotels, offices, ...



Services and infrastructures

Hospitals, schools, stadiums, camping and mobile home grounds, parking lots, ...



Production lines

Power consumption control of each production line or sector, ...



Transportation

Airports, boat docks and platforms, train stations, ...



Waterworks

Treatment and distribution of drinking water, ...



Telecommunications

Telecommunication antennas, ...

Energy meters

Best control, energy quality and saving



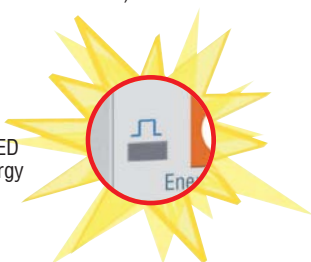
Multifunction keys

Multifunction keys allow to program the device, to reset the partial count and scroll the measurements.



Active energy

All the versions do measurements of active energy with accuracy class 1 (IEC/EN 62053-21).



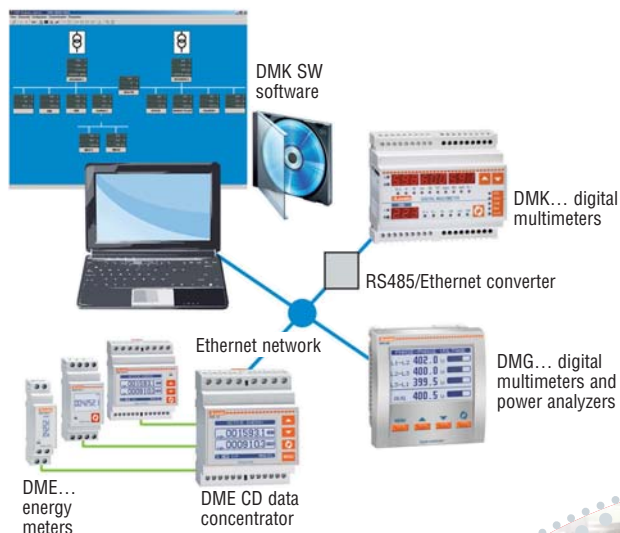
Metrologic LED

The flashing rate of the LED is proportional to the energy consumption.

Integration with other LOVATO Electric products

The DME series energy meters can be integrated with DMK and DMG series digital multimeters since units have in common:

- Expansion modules
- Digital inputs and outputs
- Communication ports (RS485, Ethernet, USB and RS232)
- Software.



CE M11

Certified MID energy meters

DME D... type energy meters (with digital display) will be available even in the MID certified version.

In the European Union, each measuring instrument, which data is used for an monetary transaction (billing), must be compulsorily certified according to the MID - Measuring Instruments Directive.



Sealable terminal covers included

The energy meters are duly equipped with a set of two sealable terminal covers.

Accuracy

- Active energy measurement accuracy Class 1 per IEC/EN 62053-21.
- Reactive energy measurements accuracy Class 2 per IEC/EN 62053-23.
- For MID certified versions: Class B per EN 50470-3.

DME M... compliance (with mechanical display)

Comply with standards:
- IEC/EN 61010-1, IEC/EN 61326-1.

DME D... certifications and compliance (with digital display)

Certifications pending:
- MID class B (EN 50470-1-3) issued for types with MID suffix only; certificates per module B (type tests) and module D (production conformity).
- UL for USA and Canada (single-phase types only).

Comply with standards:
- IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3 for non MID versions;
EN 50470-3 for MID versions.



single phase

Mechanical energy meters



DME M100

- Maximum 32A current
- Direct current connection
- Display with 6+1 digits
- Active energy measurement (Class 1)
- 1-module housing.

DME M100 T1

- Features as DME M100 and with 1 static pulse output.

Digital energy meters



DME D100 T1

- Maximum 40A current
- Direct current connection
- LCD screen with 5+1 digits
- Active energy measurement (Class 1)
- 1 static pulse output
- 1-module housing.

DME D100 T1 MID

- MID certified version (Class B).



DME D110 T1

- Maximum 40A current
- Direct current connection
- Backlight LCD screen with 5+1 digits
- Active energy measurement (Class 1)
- Multi-measurements
- 1 function key
- 1 programmable static output
- 1-module housing.

DME D110 T1 MID

- MID certified version (Class B).



DME D120 T1

- Maximum 63A current
- Direct current connection
- LCD screen with 6+1 digits
- Active energy measurement (Class 1)
- Multi-measurements
- 1 function key
- 1 programmable static output
- 2-module housing.

DME D120 T1 MID

- MID certified version (Class B).

three phase

Digital energy meters



DME D300 T2

- Maximum 63A current
- Direct current connection
- Backlight LCD screen with 6+1 digits
- Active energy measurement (Class 1)
- Multi-measurements
- 1 function key
- Tariff selection input (2 tariffs)
- 2 programmable static outputs
- 4-module housing.

DME D300 T2 MID

- MID certified version (Class B).



DME D310 T2

- Rated current input /5A
- Current connection by CT
- Backlight LCD screen (128x80 pixels)
- Active energy measurement (Class 1)
- Multi-measurements
- 3 function keys
- Tariff selection input (2 tariffs)
- 2 programmable static outputs
- Expandable with EXM... modules
- 4-module housing.

DME D310 T2 MID

- MID certified version (Class B).

TYPE OF DISPLAY	Mechanical		Digital				
	DMEM 100	DMEM 100 T1	DMED 100 T1	DMED 110 T1	DMED 120 T1	DMED 300 T2	DMED 310 T2
Type of connection							
Single phase	•	•	•	•	•		
Three phase							•
Three phase + neutral						•	•
Maximum current							
Direct connection up to 32A	•	•					
Direct connection up to 40A			•	•			
Direct connection up to 63A					•	•	
Connection by CT (/5A)							•
Inputs/Outputs							
Static outputs		•	•				
Programmable static output				•	•	•	•
Tariff selection input						•	•
Expandability							•
Display and keypad							
Mechanical display	•	•					
LCD screen			•	•	•	•	•
Function keys				•	•	•	•
MID certification (pending)			•	•	•	•	•



MID certification (Directive 2004/22/EC) warrants that the energy meter is designed and produced to be safe and accurate in the measurements.

LOVATO Electric products are pending MID certification per B module (type test) and D module (production conformity).



single phase non-expandable

Mechanical energy meters

Meter with 6+1 digits

The active energy count is from 0 to 999999.9kWh. The mechanical energy meter provides the consumption reading for a User even when its power supply is removed.

123456.0

Compact housing

Units have a 1-module housing per DIN standards (17.5mm wide). Maximum current is 32A.

1 module
32A



Digital energy meters

High current

The 40A rated current (direct connection) is the highest of digital meter category in a 1-module housing size (17.5mm wide).

1 module
40A

Multi-measurement

DME D110 T1 and DME D210 T1 meters register measurements of voltage, current, frequency, active-reactive-apparent power, active-reactive energy (total and partial counts) and power factor.

V-A-Hz
kWh-P.F.



LCD screen

A white-backlight icon display ensures top-quality readings even in poor light conditions.

02452.1

three phase expandable

Digital energy meters

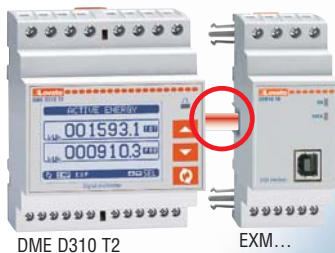
Expansion modules for DME D310 T2

The DME D310 T2 type energy meter can integrate additional functions by using the following modules:

- Digital inputs and outputs, static and relay type
- USB, RS232, RS485 and Ethernet communication interface
- Data memory with clock calendar (RTC) for events.

Optical interface

The interface between the DME D310 T2 and expansion modules is obtained by infrared beam. Appropriate connectors provide for a secure fixing of the expansion modules on the energy meter.



USB connection

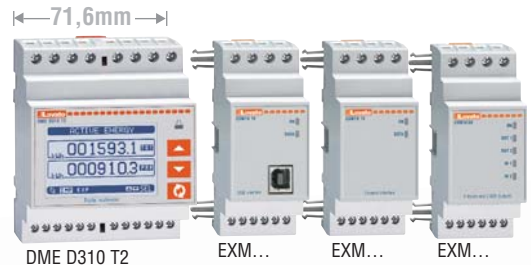
The EXM 10 10 type expansion module permits to quickly connect the energy meter to any type of computer equipped with USB port to consult data and to program the meter.

Memory module with clock calendar

Allows event and alarm storage with time stamp.



MAX
3
MODULES



Maximum of 3 expansion modules

Up to 3 EXM... expansion modules can be fitted on a DME D310 T2 and permit to:

- Communicate
- Control alarms, pulses and tariffs
- Event storage with time stamp.

Ethernet connection

The EXM 10 13 type expansion module permits the DME D310 T2 energy meter to be connected to a normal Internet network and be viewed, in this way, by one or more company computers connected online.



three phase non-expandable

Digital energy meters

02452.1

LCD screen

A white-backlight icon display ensures top-quality readings even in poor light conditions.



DME D300 T2

V-A-Hz
kWh-P.F.

Multi-measurement

Detect measurements of phase and phase-to-phase voltage, current, frequency, active-reactive-apparent (phase and total) power, active-reactive energy (total and partial counts) and power factor values.

Up to 63A direct connection in only 71.6mm

4 module
63A

It is an energy meter with one of the highest direct connection current value on the market, in a compact 4-module housing (only 71.6mm wide).

Tariffs

Consumption and tariffs (kWh) can be monitored with the digital input, for instance, considering different day and night time frames.

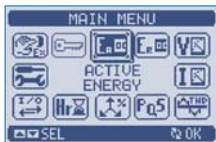
Multiple energy meters

Total and partial meters are available, showing active and reactive energy (import/export).



Graphic symbology for:

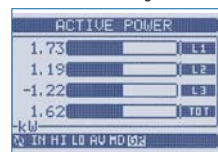
Function choice



Access status



Measurement range



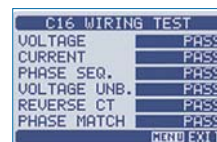
All measurements at a glance

A system can be instantaneously controlled through the display, which simultaneously views different measurements.



Wiring test

- The wiring test allows to check if the meter installation has been carried out correctly.
- The test permits to check the following:
 - Reading of the three voltages
 - Reading of the three currents
 - Phase sequence
 - Voltage imbalance
 - Polarity reversal of one or more CTs
 - Phase swap between voltage/current.



Graphic LCD screen (128x80 pixels)

White backlight with adjustable intensity.

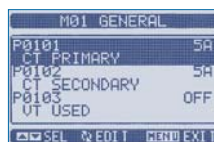


5-language texts facilitate:

Measurement consultation



Parameter setting



V-A-Hz
kWh-P.F.

Multi-measurement

Detect measurements of phase and phase-to-phase voltage, current, frequency, active-reactive-apparent (phase and total) power, power factor and active-reactive-apparent energy (total and partial counts) values.

Tariffs

Consumption and tariffs (kWh) can be monitored with the digital input, for instance, considering different day and night time frames.



Data concentrator

Data collection of energy consumption to send to the PC

Expandable data concentrator

The DME CD data concentrator has been designed in combination with energy meters. It allows to connect devices without communication interface online. It is capable of pulse count coming in from the static outputs of connected energy meters (up to 8), storing data and viewing it on the display or directly on a PC through the built-in RS485 port, using the DMK SW software.

The data concentrator permits to:

- Be connected also to an Ethernet network or to serial ports, such as USB and RS232 using EXM... type expansion modules
- Make available on its display all the data of single digital meters connected and dislocated in the system
- Reduce wiring time and materials.

Characteristics

- Graphic backlight LCD screen (128x80 pixels)
- 4 function keys
- 8 inputs for pulse count, expandable up to 14 using EXM 10 00 and EXM 10 01 type expansion modules
- 8 total energy meters or else up to 14
- 8 partial energy meters or else up to 14, clearable
- Built-in RS485 interface (Modbus®-RTU or ASCII)
- Compatible with DMK SW software
- Expandable with EXM... type modules.

Up to 16 energy meters are available and can have the following functions:

- Enabling
- Page description
- Unit of measure
- Count up and count down
- Clearing (total and partial)
- "Weight" count source and type of count (multiplier or divider).



DME CD



EXM...

Derivative measurement calculation

Starting from pulses received, the mean of instantaneous quantities, such as power (instantaneous energy consumption), speed, production rate, can be possibly determined.

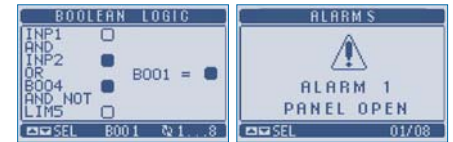


Arithmetic operations among meters

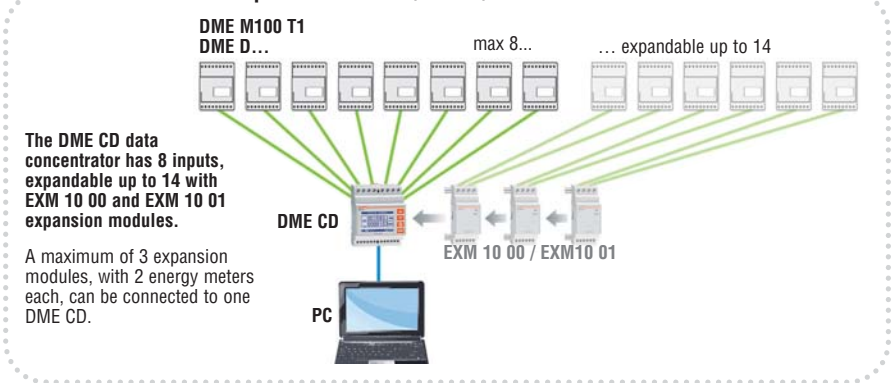
- Addition, subtraction, multiplication, division
- Sum of constants.

The following functions can also be programmed

- hour counter, limit threshold, logic operation, remote variable (via Modbus), alarm and programmable input/output.



Connection example for 14 stores/rooms/offices



Software

Control, monitoring and data supervision for energy consumption

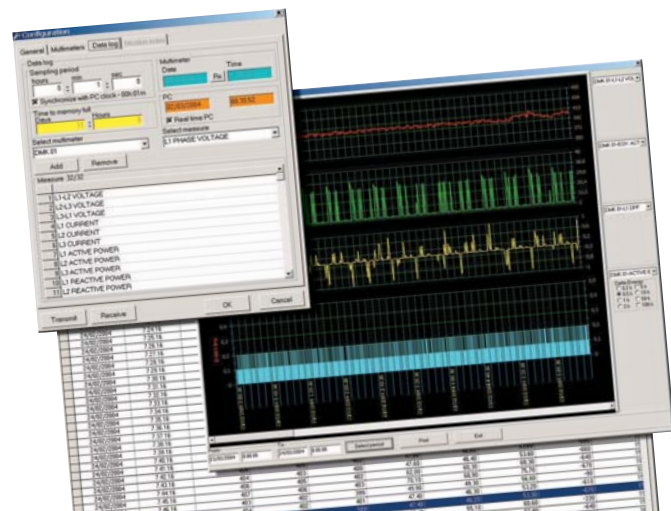
DMK SW software

Data and energy consumption are displayed. Data, related to different machinery, production lines and areas in a building, can be collected and a balance of consumption thereby be obtained according to the type of required setting.

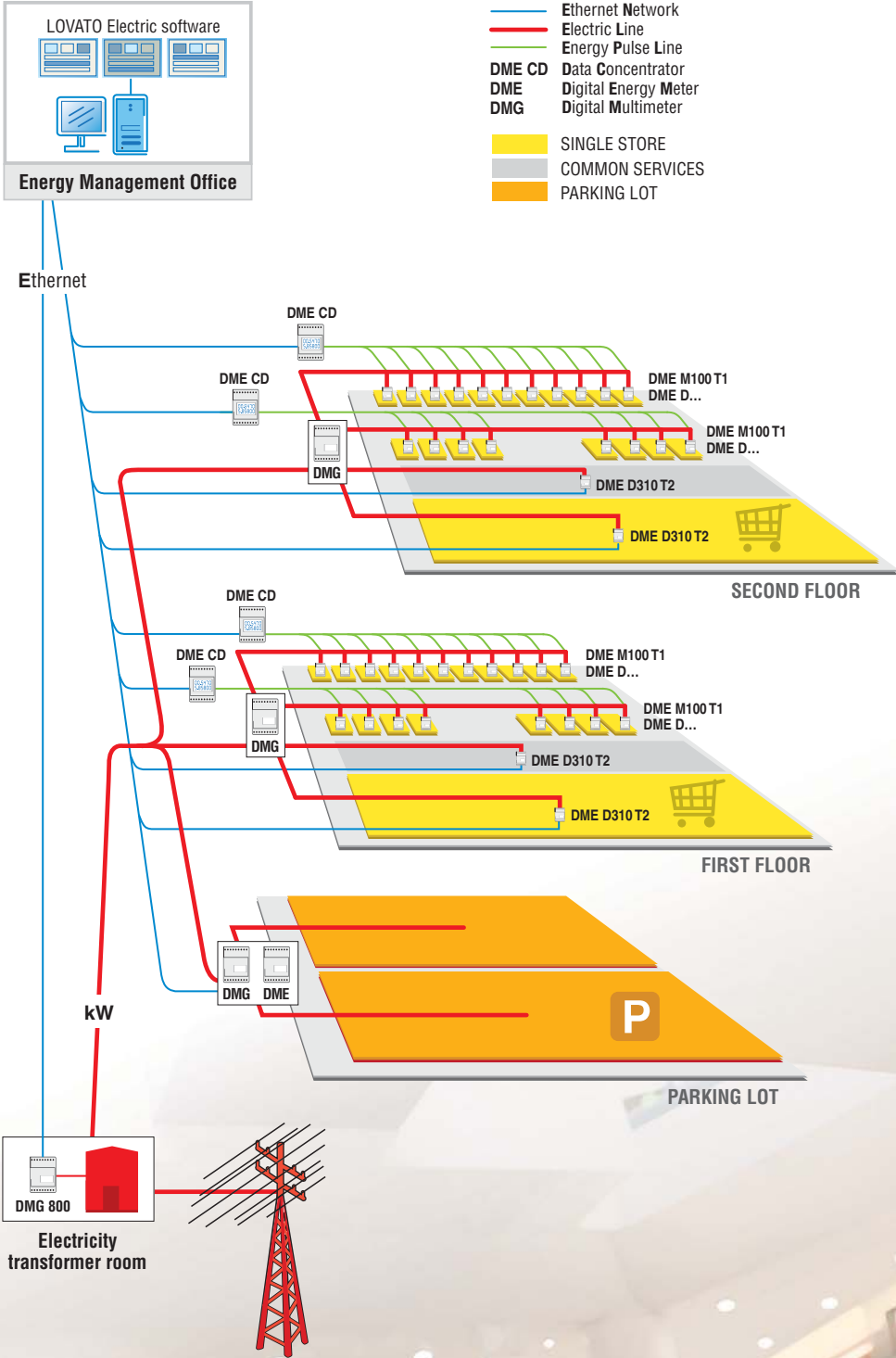
This software also allows communications between DME series energy meters and LOVATO Electric DMK and DMG series digital multimeters, using expansion modules or the data concentrator.

It is possible to view:

- Interactive synoptic chart of a system
- Real-time electrical measurements
- Trend graphs
- Consumption estimates
- Statistical analysis
- Alarms and events.



Application example: shopping centre



How to order

Order code	Description	Qty per pkg	Wt [kg]
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ENERGY METERS

Single phase with mechanical display

DME M100	32A, direct connection, 230VAC 50/60Hz	1	0.084
DME M100 T1	32A, direct connection, 1 pulse output, 230VAC 50/60Hz	1	0.088

Single phase with digital display

DME D100 T1	40A, direct connection, 1 pulse output, 220-240VAC 50/60Hz	1	0.086
DME D100 T1 MID	40A, direct connection, 1 pulse output, 230VAC 50Hz, MID certified ②	1	0.086
DME D100 T1 A120	40A, direct connection, 1 pulse output, 120VAC 50/60Hz	1	0.086
DME D110 T1	40A, direct connection, 1 programmable output, multi-measurements, 220-240VAC 50/60Hz	1	0.090
DME D110 T1 MID	40A, direct connection, 1 programmable output, multi-measurements, 230VAC 50Hz, MID certified ②	1	0.090
DME D110 T1 A120	40A, direct connection, 1 programmable output, multi-measurements, 120VAC 50/60Hz	1	0.090
DME D120 T1	63A, direct connection, 1 programmable output, multi-measurements, 220-240VAC 50/60Hz	1	0.148
DME D120 T1 MID	63A, direct connection, 1 programmable output, multi-measurements, 230VAC 50Hz, MID certified ②	1	0.148
DME D120 T1 A120	63A, direct connection, 1 programmable output, multi-measurements, 120VAC 50/60Hz	1	0.148

Three phase with neutral (non-expandable) with digital display

DME D300 T2	63A, direct connection, 2 programmable outputs, 1 input for tariff selection, multi-measurements, 220-240/380-415VAC 50/60Hz	1	①
DME D300 T2 MID	63A, direct connection, 2 programmable outputs, 1 input for tariff selection, multi-measurements, 230/400VAC 50Hz, MID certified ②	1	①

Three phase with or without neutral (expandable) with digital display

DME D310 T2	CT/5A connection, 2 programmable outputs, 1 input for tariff selection, multi-measurements, 220-240/380-415VAC 50/60Hz, expandable with EXM... type modules	1	0.332
DME D310 T2 MID	CT/5A connection, 2 programmable outputs, 1 input for tariff selection, multi-measurements, 230/400VAC 50Hz, expandable with EXM... type modules, MID certified ②	1	0.332

DATA CONCENTRATOR (EXPANDABLE)

DME CD	Data concentrator for DME M... and DME D... types, equipped with pulse output, inputs for up to 8 energy meters, RS485 interface, 220-240VAC 50/60Hz and 120-250VDC, expandable with EXM... type modules	1	0.327
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ACCESSORIES

DMK SW	Remote control software for PC-DME D...	1	0,246
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Expansion modules for DME D310 T2, DME D310 T2 MID and DME CD

EXM 10 00	2 digital inputs and 2 static outputs, opto-isolated	1	0.137
EXM 10 01	2 opto-isolated digital inputs and 2 output relays rated 5A 250VAC	1	0.147
EXM 10 10	Opto-isolated USB interface	1	0.140
EXM 10 11	Opto-isolated RS232 interface	1	0.125
EXM 10 12	Opto-isolated RS485 interface	1	0.140
EXM 10 13	Opto-isolated Ethernet interface	1	0.140
EXM 10 20	Opto-isolated RS485 interface and 2 output relays rated 5A 250VAC	1	0.140
EXM 10 30	Data storage, clock-calendar (RTC) with backup battery for event logging	1	0.140

① Contact our Customer Service (Tel. +39 035 4382422; email: service@LovatoElectric.com).

② Certification pending.

DME M... technical characteristics

- Auxiliary supply: Self powered
- Active energy measurement accuracy: Class 1 per IEC/EN 62053-21
- Degree of protection: IP20 on terminals
IP40 on front
- Operating temperature: -25...+55°C
- Storage temperature: -30...+80°C
- Power consumption: 7VA
- Power dissipation: 0.1W

DME D... technical characteristics

- Auxiliary supply: Self powered
- Active energy measurement accuracy: Class 1 per IEC/EN 62053-21
- Degree of protection: IP20 on terminals
IP51 on front
- Operating temperature: -25...+55°C
- Storage temperature: -25...+70°C
- Power consumption: <10VA
- Power dissipation: <2W



Switch disconnectors
16 to 1600A



Fuse holders



10x38 DC fuses



Modular digital multimeters



Flush mount digital multimeters
and power analyzers

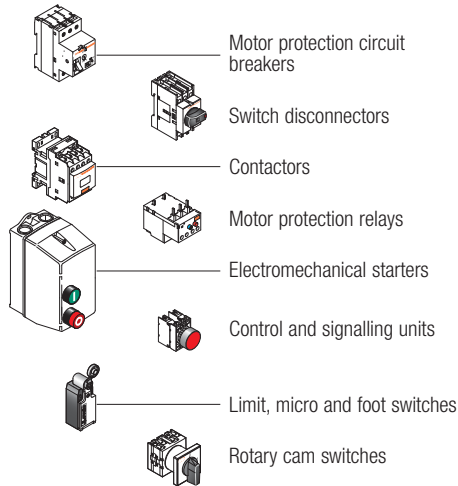


Switching power supplies

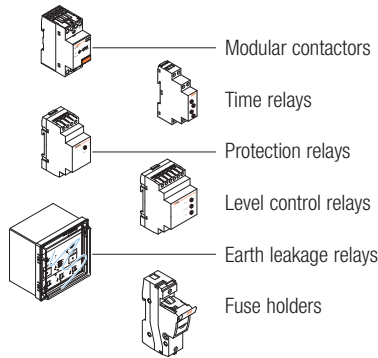


100% electricity

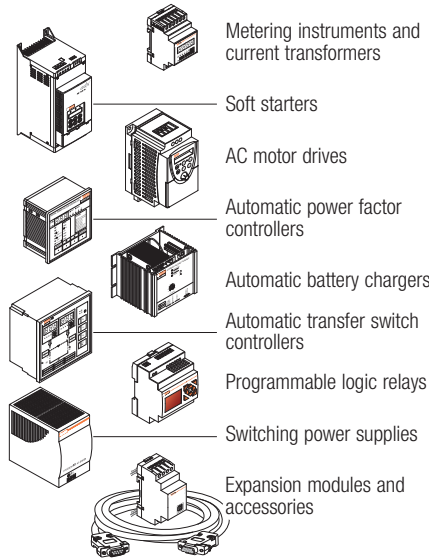
Planet Switch



Planet Din



Planet Logic



www.LovatoElectric.com

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