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TRIMOD HE 20 kVA

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version h 1370


version h 1650

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1. GENERAL SPECIFICATIONS

The Legrand **TRIMOD HE 20** is an UPS on line double conversion with PWM Hi-Frequency technology. It has passing trough neutral and Modular Architecture with the possibility to have N+X redundancy. The nominal power is 20 kVA – 20 kW. Batteries are lead acid, sealed, free maintenance, valve regulated, and arranged, inside the UPS or external battery cabinet, in dedicated Drawers, in order to guarantee compact dimensions reducing weights and DC voltage level.

1.1 Modularity

The UPS **TRIMOD HE 20** has modular architecture, it is composed by identical modules which work in parallel. Modules are:
- Power Modules 6,7 kVA;
- Battery Drawers of five batteries (7.2Ah or 9Ah).

These modules are installed inside the UPS and have identical functions.
Power Modules are composed by the following circuits:
- Rectifier/PFC
- Inverter
- Battery Charger
- Command Logic circuit
- Automatic By-pass

Battery drawers contain 5 batteries, and are easy to be move and replace.

1.2 Adaptabilty

The UPS can be easily configured on site, by the user, to work as three-phase or single phase either in input than output.

1.3 Scalability

The modularità of TRIMOD UPS allows to execute Power and Autonomy upgrade. Thanks to the intelligent Plug N' Play connection, no HW and SW settings are needed to increase or decrease the power or the autonomy.

1.4 Redundancy

The modularità of the UPS allows the N+X redundant configurations. The Redundacy is achieved using more modules than needed, modules will run in "load sharing".

1.5 Architecture

The UPS **TRIMOD HE 20**, if configured as single-phase output has an architecture of distributed parallel type, all power modules share the load running in parallel. In this way no power module stays in stand-by but all of them run in load sharing, giving the continuous protection of the load (the configuration must be previously dimensioned in the appropriate way).
If the UPS is configured as three–phase output, the distributed parallel architecture is in each phase (if there are more modules in the same phase phase).

In case of redundant configuration, whenever one module fails, the other modules in the same phase will guarantee the Energy supply and protection to the load. The available power in each phase will be always the sum of the power of the modules installed in that phase.

1.6 By-pass

In each Power Module there is a static By-pass system which, in case of overload or other anomaly, automatically transfer the load to the mains.

A dedicated software of remote monitoring and management, installed on a PC connected to the UPS, allows to check and set all working parameters of TRIMOD HE (the same functions available on the UPS control panel) and, furthermore, to schedule and program computer remote shutdown. Optional software (UPS SuperviSor) or Net Interface card (CS121 SK) allow the multi server shutdown and UPS remote control on the LAN.

TRIMOD HE is controlled by a main microprocessor which works together with microprocessors in each power modules;
By display is possible to check all measurements, working parameters and status of the system.

Here follow the measurements and working parameters available on the **display**:

Input
Current:
- RMS value
- Peak value
- Crest Factor

Voltage:
- Ph-N RMS value
- Ph-Ph RMS value

Power:
- Nominal (VA)
- Active (W)

Power Factor
Frequency

Output
Current:
- RMS value
- Peak value
- Crest Factor

Voltage:
- Ph-N RMS value
- Ph-Ph RMS value

Power:
- Nominal (VA)
- Active (W)

Power Factor
Frequency

Batteries
- Voltage
- Capacity
- Current
- History data
- Residual Capacity
- Charging status

Misc.
- Internal Temperature
- Fan Speed
- HV DC BUS Voltage

Data log.
- By-pass intervention
- Overheats
- Overloads
- Battery interventions
- Total discharge
- Events (info, warning, critical)
- Alarms

1. GENERAL SPECIFICATIONS *(continue)*

The UPS allows also the following settings by **display**:

Output
- Voltage
- Frequency
- Phases configuration

Input
- Enable freq. synchronizing (PLL)
- Extended synchronizing range (Extended PLL)

By-Pass
- Enabling
- Forced
- DIP Speed
- Off-line Mode
- EPS Mode

Batteries
- Start up on Battery
- Threshold value
- Auto restart
- Max Time on battery

The UPS **TRIMOD HE 20** has the CE Mark accordingly with the EU Directives 2006/95, 2004/108 and it comply with following standards:
- EN 62040-1 “General rules for electric safety”
- EN 62040-2 “Electromagnetic compatibility and immunity (EMC)”
- EN 62040-3 “Performances and testing rules”

General Specifications	
UPS Topology	On line double conversion VFI SS 111
Architecture of the UPS	Modular, scalable, redundant based on 6,7 kVA Power Modules
In/Out phase Configuration	Three phase-Three phase
Neutral	Neutral Passing through
Output wave form on mains run	Sinusoidal
Output wave form on battery run	Sinusoidal
Bypass type	Automatic by-pass (static and electromechanic) & Manual maintenance by-pass
Transfer time	Zero

Input	
Nominal Voltage	380, 400, 415 3F+N+PE (220, 230, 240 1F)
Voltage range	400V -20% +15% 230V -20% +15%
Frequency	45-65Hz (43,0 ÷ 68,4 hz)
$THDI_{in}$	< 3%
Power Factor	1

Output with mains (AC-AC)	
Nominal voltage	380, 400, 415 3F+N+PE (220, 230, 240 1F)
Nominal power	20.000 VA
Active power	20.000 W
Efficiency (VFI)	up to 96%
Voltage variation (static)	± 1%
Voltage variation (dynamic 0-100%; 100-0%)	± 1%
THDv on nominal power (linear load)	< 1 %
THDv on nominal power (not linear load)	< 1 %
Frequency	50/60 Hz user adjustable +/- 2% (Standard), +/- 14% (Extended)
Frequency tolerance	Synchronized with input frequency or ± 1% free run
Current Crest Factor	3:1
Overload capability: • for 10 minutes • for 60 seconds	 115% load rate with no bypass intervention 135% load rate with no bypass intervention

Output in battery Run (DC-AC)	
Nominal voltage	380, 400, 415 3F+N+PE (220, 230, 240 1F)
Nominal power	20000 VA
Active power	20.000 W
Voltage variation (static)	± 1%
Voltage variation (dynamic 0-100%; 100-0%)	± 1%
THDv on nominal power (linear load)	< 1%
THDv on nominal power (not linear load)	< 1%
Frequency	50 Hz o 60 Hz (autosensing or selectable)
Frequency tolerance	± 1% free run
Current Crest Factor	3:1 accordingly with IEC 62 040-3
Overload capability: • for 10 minutes • for 60 seconds	 115% 135%

Battery	
Type	Lead Acid, sealed, free maintenance VRLA (on request longlife battery)
Unit Capacity	7,2 or 9 Ah (12V)
Nominal UPS Battery Voltage	240 Volt DC
Battery charger type	PWM hi efficiency, one in each power module
Charging Cycle	Smart Charger technology, advanced three charging steps
Max Charging Current	1,5 A each power module

Environmental specs	
Noise level @ 1m	46 dBA
Working temperature range	from 0°C to +40°C
Stock temperature range	from -20°C to +50°C (excluded batteries)
Humidity range	0-95% not condensing
Protection degree	IP21

Mechanical an Miscellaneous	
Net Weight without batteries [1]	120/155 kg
Dimensions (WxHxD) [2]	414 x 1370/1650 x 628 (mm)
Colour	RAL 7016
Technology rectifier/booster/inverter	MOSFET/IGBT
Communication Interface	2 serial port RS232, 1 logic level port, 5 outputs with dry contacts, 1 optional interface slot
Input/Output connections	3P + N + PE Connectors on omega bar
Number of Installed Power Modules	3 of 6700 VA
Standards	EN 62040-1, EN 62040-2, EN 62040-3

[1] The weigh depends by the number of the installed batteries accordingly with the required autonomy.

[2] The battery cabinet dimension can change depending battery set accordingly with the required autonomy.