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TRIMOD HE 20/30kW (Dual input)

3 104 68 TRIMOD HE 20/30 empty cabinet 6 slot
3 108 69 Power module 3,4kW
3 108 71 Power module 5kW

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1. GENERAL SPECIFICATIONS

The Legrand **TRIMOD HE 20/30**, is an high efficiency 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 20/30kVA – 20/30kW.

1.1 Modularity

The TRIMOD HE 20/30 UPS has an innovative modular architecture, it means that it's composed by identical modules (3,4kW or 5kW single phase power module) that, working in parallel, form the power section of the UPS. Each power module can be considered a complete single phase UPS who works in parallel with the others in order to supply the required power.
The power module can be divided in the following functional blocs:

- Rectifier/PFC
- Inverter
- Battery Charger
- Command Logic circuit
- Automatic By-pass

It's possible to reach different power and redundancy levels according to the number of installed power module.

1.2 Scalability

The cabinet is designed to accept different number of power modules, this allows to create a huge range of configurations.
It's possible to increase power directly on site easily, without changing settings nor adjustments. This operation can be lead without using any kind special equipment.

1.3 Redundancy

You can easily set up the TRIMOD HE 20/30 as a N+X power redundant system. It will be enough defined how many 3,4kW or 5kW power modules must be installed inside the cabinet.
We can reach redundancy thanks to the load sharing, the overall load is equally shared between the power modules and in case of failure the still-working modules will back up the faulty one.

1.4 Architecture

The TRIMOD HE 20/30 UPS has single/three phase input and output and it's possible manage the output phases in independent way thank to the parallel architecture. The nominal power available is determinate by the sum of the power module per phase. For this reason the UPS is able, if properly sized, to supply the load in case of failure or replacement of one or more power modules.

1.5 Hot-Swap

The power modules of the TRIMOD HE 20/30 are supervised and managed by 2 independent control board which operate in parallel. Each control board is able to manage up to 3 power modules. This architecture allows to enable a single control board and consequently only the power modules managed for the replacement without switch off the others. In case of redundant or upgradable configuration the service technician can operate on the UPS which continues to guarantee high quality energy and protection to the load.

1.6 By-pass

Each power module has an independent automatic bypass system that switch the load on the input line in case of overload, over temperature, inverter failures, and any kind of anomalies. The UPS is equipped as standard with the Manual Bypass, placed in the front side of the cabinet.

1.7 Dual input

On the front side of TRIMOD HE 20/30 there are 2 input lines, one for the main and one for the auxiliary line.
These two input line are bridged by default but the connection can be easily removed obtaining two independent input lines during installation or commissioning.

1.8 Batteries

Batteries are lead-acid, sealed, free maintenance, valve regulated and arranged, inside the UPS and the external battery cabinet; the battery strings are composed by 20 battery blocks. The UPS can manage four independent battery set in order to have full decentralised modularity also on batteries (only for UPS with more Control boards).

1.9 Communication and user interface

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 20/30 (the same functions available on the UPS control panel) and, furthermore, to schedule and program computer remote shutdown (compatible with Windows and Linux).
Optional software (UPS Management Software) and Net Interface card (CS141 SK) allow the multi server shutdown and UPS remote control on the LAN.
Here below 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
- Bypass Line Voltage

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

Power Factor
Frequency

All the measurements and the working parameters are also available on 2 different Net Interface Cards (SNMP) board. On the front side of TRIMOD HE 20/30 are available also:
1 x 5 Dry contacts
1 x RS232 port for service
1x logic level port

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1. GENERAL SPECIFICATIONS *(continue)*

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

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

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

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
- ECO Mode

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

The UPS TRIMOD HE 20/30 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”

2. TECHNICAL SPECIFICATIONS

General Specifications	
UPS Topology	On line double conversion VFI SS 111
Architecture of the UPS	Modular, scalable, redundant based on single phase Power Modules
In/Out phase Configuration	1-1 / 3-3 / 3-1 / 1-3
Neutral	Neutral Passing through
Output wave form on mains run	Sinusoidal
Output wave form on battery run	Sinusoidal
Bypass type	Static, electro-mechanic and maintenance bypass
Transfer time	Zero

Input	
Nominal Voltage	380, 400, 415 3ph+N+PE
Voltage range	-20% +15%
Frequency	45 Hz o 65Hz (autosensing)
$THDI_{in}$	< 3%
Power Factor	> 0.99

Output with mains (AC-AC)	
Nominal voltage	380, 400, 415 3ph+N+PE
Nominal power	20/30kVA
Active power	20/30kW
Efficiency	up to 96%
Voltage variation (static)	± 1%
Voltage variation (dynamic 0-100%; 100-0%)	± 1%
THDv on nominal power (linear load)	< 0,5 %
THDv on nominal power (not linear load P.F.=1)	< 1 %
Frequency	50 Hz o 60Hz
Frequency tolerance	Synchronized with input frequency adjustable range from +/- 1% to +/- 14% or ± 1% free run
Current Crest Factor	3:1 accordingly with IEC 62040-3
Overload capability: • 10 min • 60 sec	 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 3ph+N+PE
Nominal power	20/30kVA
Active power	20/30kW
Voltage variation (static)	± 1%
Voltage variation (dynamic 0-100%; 100-0%)	± 1%
THDv on nominal power (linear load)	< 0,5 %
THDv on nominal power (not linear load)	< 1 %
Frequency	50 Hz o 60Hz (autosensing)
Frequency tolerance	± 1% free run
Current Crest Factor	3:1 accordingly with IEC 62 040-3
Overload capability: • 10 min • 60 sec	 115% 135%

Battery	
Type	Lead Acid, sealed, free maintenance VRLA
Unit Capacity	Depending on backup time
Nominal UPS Battery Voltage	240 Volt DC
Battery charger type	PWM hi efficiency, one in each power module
Charging Cycle	Smart Charge technology 3-step advanced cycle
Max Charging Current	2,5 A each power module

Environmental specs	
Noise level @ 1m	58-62 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	85 kg
Dimensions (WxHxD)	414 x 1370 x 628 (mm)
Colour	RAL 7016
Technology rectifier/booster/inverter	IGBT
Communication Interface	1 x RS232 port for service, 1x 5 Dry contacts 1x logic level port, N.2 SNMP slot
Input/Output connections	3Ph + N + PE
Number of Control boards	2
Number of installable Power Modules	up to 6 of 3,4kW or 5kW
Standards	EN 62040-1, EN 62040-2, EN 62040-3