

# KEOR T 20 kVA

3 102 08 - 3 102 09 - 3 102 10 - 3 102 11



| INDEX                             | Page |
|-----------------------------------|------|
| 1. General specifications .....   | 1    |
| 2. Technical specifications ..... | 2    |

## 1. GENERAL SPECIFICATIONS

Legrand UPS model KEOR T 20 is an uninterruptible power source with 3-Level IGBT switching technology, high frequency PWM technology, Double Conversion On-line, solid neutral, with the possibility to have N+X on site modular redundancy up to total 8 units, Rated Power 20 kVA–18 kW.

Batteries are lead acid, sealed, free maintenance, valve regulated, and arranged, inside the UPS in dedicated Drawers or external battery cabinet.

The architecture of this UPS is a Tower type. Two different cabinet sizes are available for internal battery configuration. 1345h cabinet is sized to guarantee a minimum uptime of 8 minutes and 1650h cabinet is sized to guarantee a minimum uptime of 24 minutes at 70% of 0,9PF load.

It is possible to install 60pcs battery (7Ah or 9Ah) to 1345h cabinet and 120pcs battery (7Ah or 9Ah) to 1650h cabinet.

### 1.1 Architecture

Legrand UPS model KEOR T 20 has stand-alone architecture. UPS is composed by following parts;

- IGBT Rectifier/PFC
- 3-Level IGBT Switching Technology
- Digital Signal Processor (DSP)
- 3.5" TFT Touch Panel
- Automatic Bypass
- Dual Input Bypass
- Internal Manual Bypass
- Standard Internal Backfeed Protection
- Internal Battery Drawer Shelves

The UPS can be easily configured on site, by the authorized personnel, to operate in parallel. Also it is possible to arrange the dual bypass by removing bridge connection on each input phase.

Legrand KEOR T 20 has 3-Level IGBT switching technology and there is no transformer in the unit. These provide high efficiency for the unit.

Backfeed protection provides additional protection at the input in the event of bypass thyristors are short circuited.

By using internal backfeed contactor in bypass line provides safety when fault situation occurs in static bypass line and prevents upstream energy to the input. The internal backfeed protection provides an easy on site installation without any additive cabling or special MCCB type in the upstream distribution panel.

### 1.2 Redundancy:

The Redundancy of the UPS allows N+X redundant configurations. Up to 8 units of same size UPS can be connected in parallel.

### 1.3 By-pass

KEOR T has internal both static bypass and mechanical (maintenance) bypass as standard. Addition to this input and bypass inputs can easily be separated to obtain dual input by removing the bridge on the connector.

### 1.4 Control and Monitoring:

KEOR T is equipped with a touch screen graphic TFT display that provides information, measurements, statuses and alarms of the UPS in different languages. Below this display, there is a multicolour LED bar showing status of UPS.

- GREEN: Normal or ECO Mode Operation
- ORANGE: Bypass or Battery Operation
- RED: Load not Supplied

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 KEOR T (the same functions available on the UPS control panel) and, furthermore, to schedule and program computer remote shutdown. Optional software (UPSMAN) or Net Interface card (CS121 SK) allow the multi server shutdown and UPS remote control on the LAN. Also, standard interface board comes with;

- RS232 Serial Communication Port
- Emergency Power Off (UPS OFF)
- Generator Contact (GEN ON)
- 4pcs programmable Dry Contact Information
- 2 contactor relays for Bypass and Battery
- ModBus (over RS485, with 2400 Baud Rate)

Standard Dry Contact Alarms are General Alarm, Bypass Active, Input Failure and Synchronization OK. Addition to these; High Temperature, Battery Test Failure, Output Failure alarms can be assigned to the contacts. Each alarm can be assigned to separate contacts but also one alarm may be assigned to all contacts. KEOR T front panel is controlled by DSP microprocessor which works together with DSP microprocessors in rectifier and inverter; 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**:

#### RECTIFIER (INPUT)

Voltage (Vac), per phase  
Current (Aac), per phase  
DC BUS Voltage (±Vdc)  
Heatsink Temperature (°C)

#### INVERTER (OUTPUT)

Voltage (Vac), per phase  
Current (Aac), per phase  
Apparent Power (kVA), per phase  
Active Power (kW), per phase  
Power Factor (load), per phase  
Bypass Voltage, per phase  
Load (%), per phase  
Heatsink Temperature (°C)

#### FREQUENCY

Input Frequency (Hz)  
Output Frequency (Hz)

#### BATTERY

Voltage (±Vdc)  
Current (±Adc)  
Temperature  
Autonomy (minute)

## 1. GENERAL SPECIFICATIONS *(continue)*

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

### OUTPUT

Voltage (380/400/415)  
Frequency (50Hz/60Hz)

### PARALLEL MODE

Parallel Mode  
(Enable/Disable(Single))  
UPS ID

### BATTERY

Battery String  
Battery Capacity

Redundancy (+1, +2, ..., +7)  
Operation Mode (Redundancy  
Power Increase)

### COMMAND MENU

Priority (Online (Inverter) /Green (Bypass))  
Battery Test (KEOR T tests the battery automatically once  
each 90 days)  
Maintenance (Rectifier, Inverter, Bypass, Load Supply – YES/NO)

### RELAY FUNCTIONS

Relay 1 (General Alarm as standard. Can be adjusted from 7 different  
alarms)  
Relay 2 (Input Failure as standard. Can be adjusted from 7 different  
alarms)  
Relay 3 (Battery Failure as standard. Can be adjusted from 7  
different alarms)  
Relay 4 (Output Failure as standard. Can be adjusted from 7 different  
alarms)

### OPTIONS

Alarm Voice (Enable/Disable)  
Key Voice (Enable/Disable)  
Warning Window (Enable/Disable)

### OTHER

Display Brightness (0 to 100)  
Emergency Power Off (NC/NO)  
Generator Mode (NC/NO)  
ModBus ID  
Time (hh:mm. Required for Event Log stamp)  
Date (dd:mm:yyyy. Required for Event Log stamp)  
Language (English)

Legrand KEOR T displays up to 380 last events. Events are stored in  
EEPROM using FIFO method. Order number of last occurred event is  
001 and the last event in the list is erased when there are 380 events.

The UPS KEOR T has the CE Mark accordingly with the EU Directives  
73/23, 93/68, 89/336, 92/31, 93/68 and it complies 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               | Stand alone, transformerless, On-Site<br>Paralleling         |
| In/Out phase Configuration            | Three phase-Three phase (Optional Three<br>phase-Mono phase) |
| Neutral                               | Neutral Passing through                                      |
| Switching Technology                  | 3-Level IGBT   |
| Backfeed Protection                   | Internal, standard   |
| Output wave form on mains operation   | Sinusoidal   |
| Output wave form on battery operation | Sinusoidal   |
| Standards                             | EN 62040-1, EN 62040-2, EN 62040-3                           |

| Input           |   |
|-----------------|---|
| Nominal Voltage | 400 3ph+N+PE  |
| Voltage Range   | 312 - 467 Ph-Ph full load<br>208 - 467 Ph-Ph half load" |
| Frequency       | 45 - 65Hz   |
| THDin           | < 7% at full load                                       |
| Power Factor    | > 0.99  |

| Bypass          |                             |
|-----------------|-----------------------------|
| Nominal Voltage | 400 3ph+N+PE                |
| Voltage Range   | ±10% (adjustable)           |
| Frequency       | ±3Hz (adjustable)           |
| Bypass type     | Static and electro-mechanic |
| Transfer time   | Zero                        |
| Manual Bypass   | Built-in                    |

| Output with mains (AC-AC)                |  |
|--|--|
| Nominal Voltage                          | 380, 400, 415 3ph+N+PE   |
| Nominal Power                            | 20.000 VA  |
| Active Power                             | 18.000 W   |
| Voltage variation (static)               | ± 1%   |
| THDv on nominal power (linear load)      | < 2%   |
| THDv on nominal power (non-linear load)  | < 4%   |
| Frequency                                | 50 Hz or 60 Hz (selectable)  |
| Frequency tolerance                      | ± 0,1% Synchronized with input frequency   |
| Current Crest Factor                     | 2,5:1 accordingly to IEC 62040-3   |
| Overload capability:<br>10 min<br>60 sec | 125% load rate with no bypass transfer<br>150% load rate with no bypass transfer |

| Output in battery Operation (DC-AC)      |                                  |
|--|----------------------------------|
| Nominal Voltage                          | 380, 400, 415 3ph+N+PE           |
| Nominal Power                            | 20.000 VA                        |
| Active Power                             | 18.000 W                         |
| Voltage variation (static)               | ± 1%                             |
| THDv on nominal power (linear load)      | < 2%                             |
| THDv on nominal power (non-linear load)  | < 4%                             |
| Frequency                                | 50 Hz or 60 Hz (selectable)      |
| Frequency tolerance                      | ± 0,01% free run                 |
| Current Crest Factor                     | 2,5:1 accordingly to IEC 62040-3 |
| Overload capability:<br>10 min<br>60 sec | 125%<br>150%                     |

| Battery                                      |   |
|--|---|
| Type   | Lead Acid, sealed, free maintenance VRLA                  |
| Unit Capacity                                | 7 or 9 Ah (12V)   |
| Nominal UPS Battery Voltage                  | ±360 Volt DC  |
| Max. n. of possible internal battery - 1345H | 60pcs   |
| Max. n. of possible internal battery - 1650H | 120pcs  |
| Battery charger type                         | IGBT Rectifier also charges batteries                     |
| Charging Cycle                               | Intelligent with boost charge and advanced<br>management" |
| Max Charging Current without derating        | 2 A   |

| Environmental specs         |                       |
|-----------------------------|-----------------------|
| Noise level @ 1m            | < 55dBA               |
| Operating temperature range | from 0°C to +40°C     |
| Stock temperature range     | from -20°C to +50°C   |
| Humidity range              | 20-95% not condensing |
| Protection degree           | IP20                  |

| Mechanical and Miscellaneous                      |   |
|---|---|
| Net Weight without batteries <sup>1</sup> - 1345h | 134 kg  |
| Dimensions (WxHxD) - 1345h                        | 400 x 1345 x 800 mm   |
| Net Weight without batteries <sup>1</sup> - 1650h | 185 kg  |
| Dimensions (WxHxD) - 1650h                        | 400 x 1650 x 800 mm   |
| Colour  | Enclosure: RAL 7016<br>Front Door Metal: RAL 9005   |
| Communication Interface                           | 1 serial port RS232, 1 RS485,<br>1 smart port for internal SNMP,<br>4 Dry Contacts, 1 EPO, 1 GENSET |
| Input/Output connections                          | 3Ph + N + PE  |
| Input/Output Circuit Breaker                      | 63A   |
| Internal Battery Shelf                            | Drawer type   |

<sup>1</sup> The weigh depends by the number of the installed batteries accordingly with the required  
autonomy.