

# TECHNICAL DATA SHEET “B8033”

## 30-40 kVA 3Ph(in) – 3Ph(out)

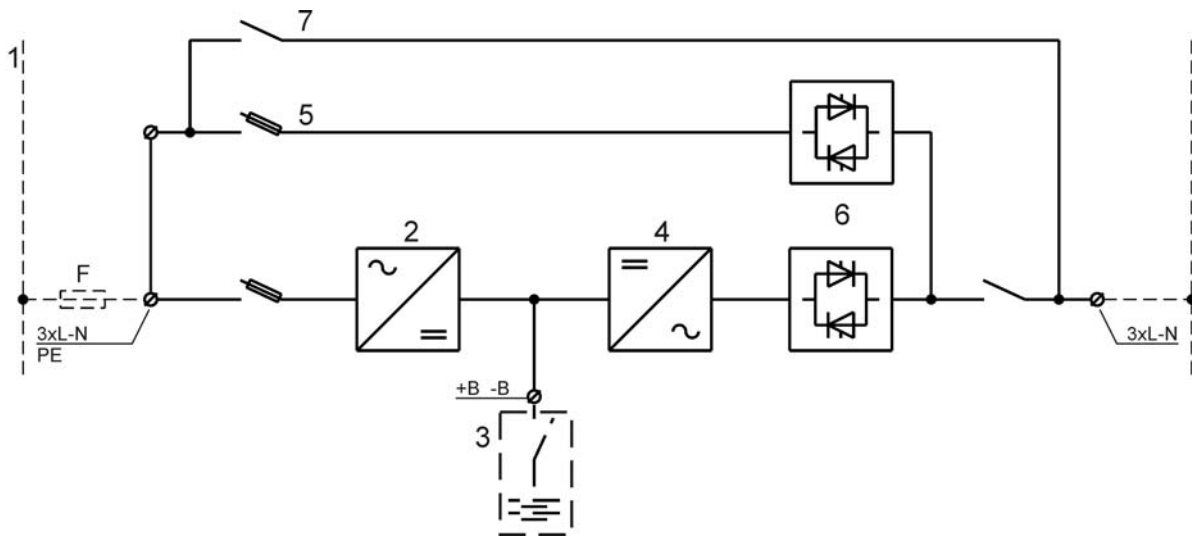
### GENERAL INFORMATION

<b>POWER</b>	<b>kVA</b>	<b>30</b>	<b>40</b>
UPS typology		ON LINE - Double conversion ECO MODE - Stand by (On request)	
Nominal output power (Cos Ø 0,8) - kVA	kVA	30	40
Nominal output power (Cos Ø 1) - kW	kW	24	32
Efficiency (AC ÷ AC) - % (ECO Mode)	%	> 92	
Efficiency (AC ÷ AC) - % (ON LINE Double conversion mode)	%	> 98	
Heat dissipation at nominal load:	W	2080	2780
	kcal/h	1788	2390
UPS ambient temperature	°C	0 ÷ 40	
BATTERY ambient temperature	°C	0 ÷ +25	
UPS storage temperature	°C	-10 ÷ +70	
BATTERY storage temperature	°C	-10 ÷ +60	
Relative humidity (non condensing)	%	< 95	
Altitude		< 1000 mt (Above See Level)	
Power derating for altitude > 1000mt		According to “IEC62040-3”, from 1000m to 2000m max with 1% derating for +100m	
Ventilation		Forced	
Requested cooling air volume	m <sup>3</sup> /h	800	900
Audible noise level (according EN 50091)	dB	< 60	
Standard battery type lead acid	n° of cells	2 x 180	
Protection degree		IP 20	
EMC compatibility		According to “EN 62040-2” (CE label)	
Safety		IEC EN 62040-1-1	
Test and performances		IEC EN 62040-3	
Paint		RAL 7035	
Accessibility		Front and top	
Installation		10 cm from the wall	
Dimensions	mm	L=450 P=650 H=1200	
Weights	kg	141	
Static load	kg/m <sup>2</sup>	483	
Input/output cable connection		Bottom / Front Side	
Movement		By wheels	
Ambient storage and transportation		According to “IEC62040-3”	

Rev.	Descrizione Description	Data Date	Emesso Issued	Controllato Checked	Approvato Approved	Lingua Language	Pagina Page	di Pag. of Pag.
/	Preliminary	30.01.2008	P. Conti	E. Simoni	E. Simoni	E	1	11
A	See VR JSE410292	01.02.2008	P. Conti	E. Simoni	E. Simoni			
B	See VR JSE410514	29.04.2008	P. Conti	E. Simoni	E. Simoni			
						<b>JUD410290</b>		

conditions		
Design standard		According to "IEC EN 62040" "ISO 9000:2000"
Free contact interface		On request
Serial communication interface		Standard: RS232 - USB Optional: RS485 (ModBus protocol)
Parallel configuration (optional)		Up to 3+1 (redundant parallel) Up to 4 (power parallel)

## BLOCK DIAGRAM



1. Input mains (common for by-pass and rectifier)
2. Rectifier and battery charger
3. External battery
4. Inverter
5. Emergency line (by-pass)
6. Inverter (SSI) and by-pass (SSB) static switch
7. External bypass

## **DESCRIPTION:**

- The UPS is designed following the criteria of low environmental impact.
- The quantity of the raw material used on the magnetic components and the number of semiconductors is minimized by the means of very advanced design criteria.
- The high overall efficiency minimizes the power consumption.
- The ECO mode function is available as standard.
- The expected battery lifetime is maximized by the very advanced digital battery charger.
- The UPS is designed in a full modular structure. Starting from a very high reliability basis (by the mean of a preliminary test and burn in of each module) and a very low time repairing time (the faulty module can be substituted in the field and repaired in the factory).
- The UPS is equipped by a built in very advanced self diagnostic program indicating the problems and suggesting to the service people how to repair the faults.
- Additional digital loops are included controlling:
  - the DC components on the output voltage (Anti Saturation Loop “ASL”)
  - the short circuit current (Soft Short Recovery Loop “SSRL”)
  - the high crest factor load current (Current Boost Gain “CBG”)

## UPS INPUT: RECTIFIER and BATTERY CHARGER

<b>POWER</b>	<b>kVA</b>	<b>30</b>	<b>40</b>
Input		3 Phase + Neutral	
Nominal input voltage	Vac	400	
Range	%	-20/+10	
Input frequency	Hz	50 - 60	
Range	Hz	±5	
Input power factor		> 0.99	
Input current THDi	%	< 3	
DC output voltage accuracy	%	±1	
Walk-in time duration	s	10	
DC output voltage ripple	% rms	1	
Battery recharging characteristic		IU (DIN 41773)	
Temperature voltage compensation		Optional	
Boost charge function (NiCd or Lead Open Battery)		Configurable	
Maximum recharging current at nominal load	A	10	8
AC-DC converter type		PFC a IGBT	
Input protection		Fuses	
Inrush input current	A	< Maximum nominal current	
Nominal Current Absorbed from Mains - A (At nominal load and Battery charged)	A	38	50
Maximum Current Absorbed from Mains - A (@ nom. Load, maximum recharging current, Uin = -20%)	A	58	72

### **DESCRIPTION:**

- The Input rectifier is designed to minimize the harmonics rejected into the input mains.
- The technology is based on a full bridge 6-IGBT matrix, fully digitally controlled.
- Large input mains variations are allowed.
- The battery charger function is included on the same converter.
- The converter is designed to recharge the battery for long time autonomies.

## BATTERY

<b>POWER</b>	<b>kVA</b>	<b>30</b>	<b>40</b>
Type (standard) other on request		Lead Sealed (Without maintenance)	
Number of Cells		2 x 180 2 x 186 (for output 415V)	
Floating voltage at 25°C	Vdc	2 x 406 2 x 418 (for output 415V)	
Minimum discharge voltage	Vdc	2 x 310	
Typical recharging current		C <sub>20</sub>	
Power requested by inverter (at nominal Load)	kW	25.4	34
Curr. req. from inverter (nominal load-minimum Vdc)	A	36	48
Battery Protection (external to the UPS)		Fuses	
Battery Test		Included as standard	

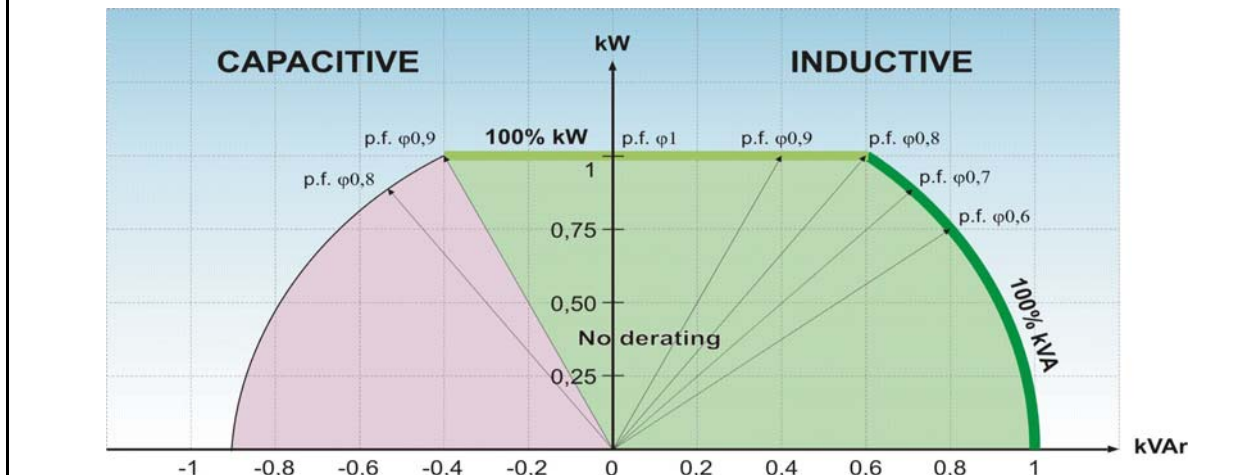
### DESCRIPTION:

- The standard battery is composed by two strings of 180 sealed lead cells.
- The recharging mode is constant current followed by constant voltage type (DIN 41773).
- The battery temperature compensation is available as an option.
- Diesel generator mode selectable.
- Several automatic and manual battery tests are available.

## UPS OUTPUT: INVERTER

<b>POWER</b>	<b>kVA</b>	<b>30</b>	<b>40</b>
Inverter Bridge		IGBT(transformerless)	
Nominal output power (Cos Ø 0,8)	kVA	30	40
Nominal output power (Cos Ø 1,0)	kW	24	32
Efficiency (DC ÷ AC)	%	> 95	
Permissible range of load power factor		See diagram	
Output		Triphase + Neutral	
Nominal Output Voltage	Vac	380 - 400 - 415	
Output Voltage Stability			
- Static (Balanced Load)	% rms	± 1	
- Static (Unbalanced Load)	% rms	± 2	
- Dynamic (Step Load 0÷100%÷0)	% rms	± 5	
- Output Volt. Recovery Time (after step load)	ms	<10	
- IEC 62040-3		Class 1	
Phase Angle			
- Balanced Load	°	±1	
- 100% Unbalanced Load			
Output Frequency	Hz	50 – 60	
Output Frequency Stability			
- Free Running Quartz Oscillator	Hz	± 0,001	
- Inverter Sync. with Mains	Hz	± 2 (configurable)	
- Slew rate	Hz/s	1	
Nominal Output Current (@ 400 Vac output)			
- Cos φ 0,8	A	45	60
- Cos φ 1		36	48
Overload Capability		125% for 10 min 200% for 100 ms	
Short Circuit Current	A	72	96
Short Circuit Characteristic		Elect. short circuit protection, current limited at 2 times nominal current Automatic stop after 5 seconds	
Selectivity		Within ½ cycle (Fuse gl 20% In)	
Output		Sinusoidal	
Output Harmonic Distortion			
- Linear Load	%	< 1	
- Non Linear Load (Crest factor 3:1)		< 5	
- IEC 62040-3		Fully compliant	
Crest Factor (Non linear load)		3 : 1	

Power factor diagram:



**DESCRIPTION:**

- The Inverter design is based on a full bridge 6-IGBT matrix, fully digitally controlled.
- The output voltage stability and the dynamic response are optimized. Nested voltage and current mode loops are implemented. The DC component on the output voltage is controlled by a separate loop (Anti Saturation Loop “ASL”).
- The output voltage total harmonic distortion is kept very low with both linear and non-linear (switching) load (Current Boost Gain “CBG”).
- The selectivity in case of short-circuit is very high and the recovery of the voltage is digitally controlled (Soft Short Recovery Loop “SSRL”).
- The Inverter is designed to minimize the battery stress during the discharge.
- ECO mode available: load on by-pass and inverter on, the load transfer time is less than 5 msec.

## UPS OUTPUT: BYPASS

Automatic static by-pass		Interruttore elettronico a tiristori
Protection		Fusibili
Bypass		Trifase + Neutro
Nominal Voltage Range	Vac %	380-400-415 ±10
Nominal Frequency Range	Hz Hz	50-60 ± 2 (configurabile)
Transfer mode		Without interruption
Trasfer inverter → automatic bypass		In case of : - Static Switch test - Inverter failure - Input inv. Volt. out of limit - Output Volt. out of limit
Retransfer automatic bypass → inverter		- Automatic - Block on bypass after 6 switches within 2 minutes, reset by front panel
Overload capability	%	- 150 continuously - 500 for 1 cycle
Manual bypass		Standard: - Electronically controlled - No break
Back feed protection		Optional

### **DESCRIPTION:**

- The back feed protection minimizes the danger caused by the inverter voltage feed back in case of by-pass fault (OPTIONAL).
- The manual by-pass is included as a standard. The electronic control avoids the risks of power interruption in case of transfer from inverter to manual by-pass and vice-versa.
- It is possible to install an external maintenance bypass, with the same functions as the internal one by means of the connection of an external auxiliary signal contact.

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## PARALLEL

Automatic parallel redundant configuration		Up to 4 by an additional card
Parallel configuration		Redundant N+1
Connection type		CAN Bus Loop
Share accuracy (max unbalancement)	%	10
Maximum sistance between two units	m	10 (more on request)
Overload capability		N x 200%
Automatic by-pass		On each unit
Manual by-pass		On each unit (common as option)

### **DESCRIPTION:**

- The parallel control is fully digital and acts on both active and reactive power on each output phase, allowing an accurate load current sharing among the UPSs', even during transient conditions.
- The parallel UPS configuration is provided with control for operation both redundant and capacity increasing.
- The Loop connection permits to disconnect one of the units from the parallel string allowing the normal operation of the remaining units.
- Parallel control is distributed (not centralised control, but on each UPS microcontroller) and communication among units uses CAN BUS connection loop, providing a highly reliable system without "single points of failure".
- Extremely simple parallel control and interconnections make easy installations and on field upgrading, adding new units to the system according to the customer's needs.

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## MONITORING

### LOCAL ON FRONT PANEL

- Synoptic diagram showing : power flow, circuit breaker status and alarms
- Battery test indicator
- LCD display
- Keyboard

### PC (Windows OS):

- o Connection point-point UPS-PC by RS232
- o Remote connection through modem
- o All the local indications, alarms and measures
- o Basic troubleshooting
- o History Events

### RELAY CARD

- **SRC card free relay contact**
  - o Eight signals Alarms/Statuses are available remote connections
  - o Free relay contact

<b>Relay</b>	<b>Description</b>	<b>Allarms/Status</b>
RL1	Common alarm	<b>A30</b>
RL2	Mains failure	<b>A01</b>
RL3	Battery end of discharge	<b>A09</b>
RL4	Inverter not OK	<b>A13</b>
RL5	Bypass feeding load	<b>A16</b>
RL6	Rectifier OK	<b>S01</b>
RL7	Inverter feeding load	<b>S04</b>
RL8	Bypass OK	<b>S06</b>

### REMOTE:

- **SNMP adapter. Optional**
  - o LAN, WAN , web server features and monitoring by a browser.
  - o UPS operation monitoring and servers management.
- **RS485 interface board. Optional**
  - o ModBus protocol
  - o UPS operation monitoring
- **Remote Panel. Optional**
  - o 4 Alarms/Statuses monitoring and common alarm

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## OPTIONS

1. BATTERY TEMPERATURE VOLTAGE COMPENSATION
2. INSULATION TRANSFORMER ON BY-PASS
3. FREE CONTACTS RELAY CARD
4. SNMP ADAPTER
5. SERIAL INTERFACE RS-485 (MOD-BUS protocol)
6. PARALLEL CARD INTERFACE
7. MODEM
8. VOLTAGE ADAPTATION AUTO-TRANSFORMERS
9. REMOTE MONITORING PANEL
10. EXTERNAL BATTERY CABINET
11. WALL MOUNTED FUSED SWITCH BOX
12. SEPARATED BYPASS INPUT
13. SPECIAL PAINT