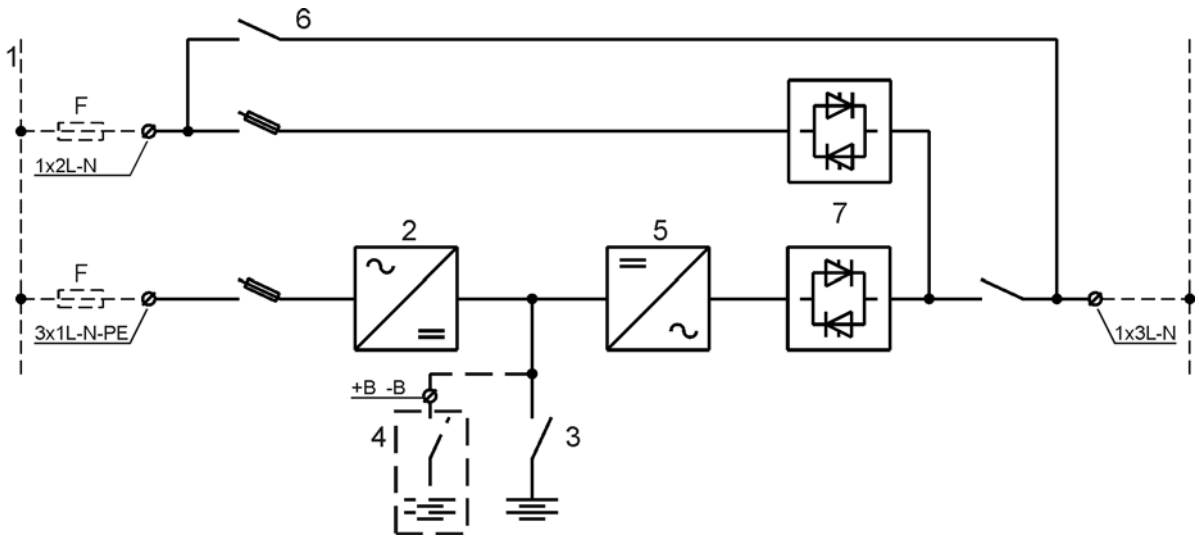
TECHNICAL DATA SHEET "B8031"

10 15 20 kVA 3Ph(in) – 1Ph(out)

GENERAL INFORMATION

POWER - kVA	**10**	**15**	**20**
UPS typology	ON LINE – Double conversion ACTIVE stand by-operation (Optional)		
Nominal output power (Cos Ø 0,8) - kVA	10	15	20
Nominal output power (Cos Ø 1) - kW	8	12	16
Efficiency (AC ÷ AC) - % (ECO mode)	>98	>98	>98
Efficiency (AC ÷ AC) - % (ON LINE Double conversion mode)	>92	>92	>92
Heat dissipation at nominal load: -W -kcal/hour	 695 598	 1040 894	 1390 1195
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"		
Ventilation	FORCED		
Requested cooling air volume - m^3/h	500	500	600
Audible noise level (according EN 50091)	< 52 db		
Standard battery type lead acid 7,2 Ah -n° of cells	2 x180	2x180	2x180
Standard autonomy time at nominal load - min.	15	8	5
Storage time of battery without recharge (at 25°C)	3 months		
Protection degree	IP 20		
EMC compatibility	According to "EN50091-2" (CE label)		
Paint	RAL 7035		
Accessibility	Front and top		
Installation	10 cm from wall		
Dimensions (mm)	W = 450	D = 650	H = 1200
Weights (kg) (without battery - with battery)	90-250	100-260	100-260
Static load (kg/m^2) (without battery - with battery)	310-854	340-890	340-890
Input/output cable connection	Bottom / Rear Side		
Movement	By wheels		
Ambient storage and transportation conditions	According to "IEC62040-3"		
Design standard	According to "EN50091" "IEC 62040"		
Free contact interface	On request		
Standard serial communication interface	RS232		

BLOCK DIAGRAM



1. Input mains (separate for by-pass and rectifier)
2. Rectifier and battery charger
3. Standard internal battery
4. Optional external battery
5. Inverter
6. Emergency line (by-pass)
7. Inverter (SSI) and by-pass (SSB) static switch

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 is available as a 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”)

RECTIFIER and BATTERY CHARGER

POWER - kVA	**10**	**15**	**20**
Input configuration	3 Phase + Neutral		
Nominal Input Voltage – Vac	230 (+10% -20%)		
Input Frequency – Hz	50-60 +/- 5		
Input Power Factor	> 0.99		
Harmonic current distortion rejected in to the mains	< 4%		
DC Output Voltage Accuracy	+/- 1%		
DC Output Voltage Ripple	2% rms		
Battery Recharging Characteristic	IU (DIN 41773)		
Temperature Battery Voltage Compensation	On Request		
Maximum Recharging Current (at nom. load) - A	2x6	2x10	2x6
AC-DC converter type	IGBT		
Input protection	Fuses		
Inrush input current - A			
Earth leakage current - mA			
Nominal Current Absorbed from Mains - A (At nominal load and Battery charged)	12	19	23
Maximum Current Absorbed from Mains - A (@ nom. Load, maximum recharging current, Uin = -20%)	24	36	36

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

POWER - kVA	**10**	**15**	**20**
Type	Without maintenance		
Number of Cells	2 x 180	2 x 186	
Floating Voltage at 25°C - Vdc	2 x 406	2 x 418	
Minimum Discharge Voltage - Vdc	2 x 310	2 x 310	
Typical recharging current	C_{20}		
Power Requested by Inverter (at nominal Load) - kW	8,5	12,7	17
Curr. Req. by Inverter (nominal load –minimum Vdc) - A	12	18	24
Battery Protection	Fuses		
Battery Test	Included as standard		

DESCRIPTION:

- The battery is composed by two strings of 180 or 186 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.
- Long autonomy batteries can be assembled in an external cubicle.
- Several automatic and manual battery tests are available.

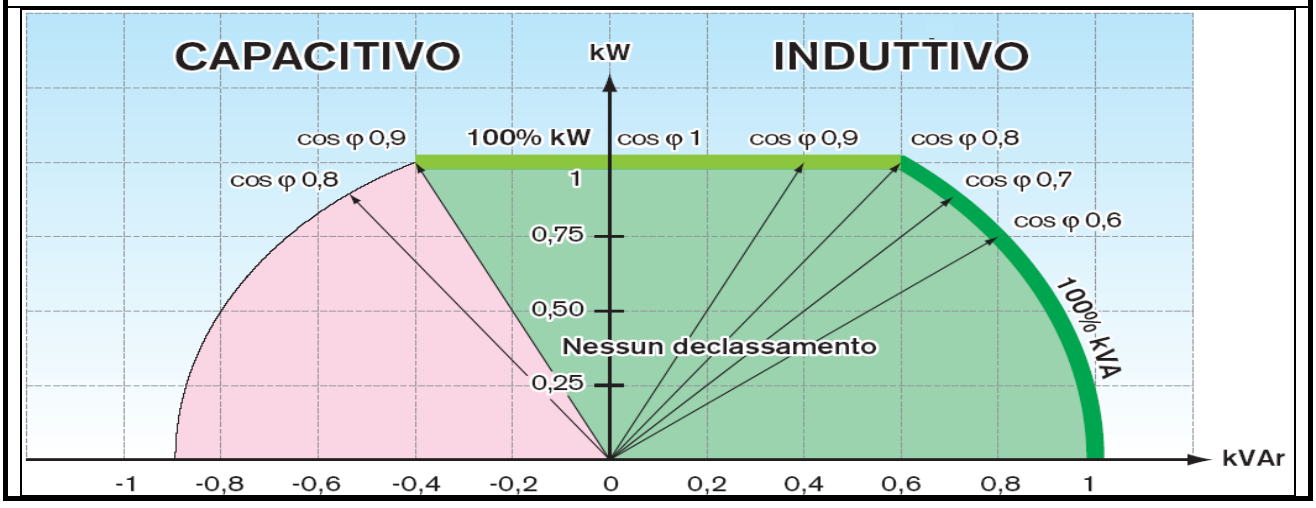
UPS OUTPUT: INVERTER

DESCRIPTION:

- The Inverter design is based on IGBT high frequency bridge, fully digitally controlled.
- The output voltage stability and the dynamic response are optimized. Nested voltage an current mode loops are implemented the DC components 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 not 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.

INVERTER

POWER – kVA	**10**	**15**	**20**
Inverter Bridge	IGBT (transformerless)		
Nominal Output Power (Cos ϕ 0,8)	10	15	20
Nominal Output Power (Cos ϕ 1)	8	12	16
Permissible range of load power factor	See Above		
Nominal Output Voltage - Vac	220-230-240 (On request)		
Output configuration	Mono-phase		
Output Voltage Stability - Static - Dynamic (Step Load 0÷100%÷0) - Output Volt. Recovery Time (after step load) - IEC 62040-3	 +/- 1% rms +/- 2% rms Within 10 msec Classification 1		
Output Frequency - Hz	50 - 60		
Output Frequency Stability - Hz - Internal Quartz Oscillator - Hz - Inverter Sync. with Mains - Hz	 +/- 0,001 +/- 2 (Other on request)		
Nominal Output Current – A (@ 230 Vac output) - PF ϕ 0,8 - PF ϕ 1	 43 35	 65 52	 87 70
Overload Capability	125% for 10 min 200% for 100 msec		
Short Circuit Current – A	70	104	140
Short Circuit Characteristic	Elect. short circuit protection, current limited at 2 times nominal current. Automatic stop after 5 seconds		
Selectivity	Within ½ cicle (Fuse gl 20% In)		
Output Waveform	Sinusoidal		
Output Harmonic Distortion - Linear Load - Non Linear Load (Crest factor 3:1) - IEC 62040-3	 <2% <5% Fully complayed		
Crest Factor (Non linear load)	3:1		



UPS OUTPUT: BY PASS

Automatic Static By-Pass	Electronic Thyristor Switch
Protection	Fuses
Nominal Voltage - Vac	220-230-240 +/-10%
Nominal Frequency - Hz	50 - 60 +/-5Hz
Transfer mode	Without interruption
Transfer Inverter ÷ Static By-Pass	In case of : -Static Switch test -Inverter failure -Input inv. Volt. out of limit -Output Volt. out of limit
Retransfer Static By-Pass ÷ Inverter	- Automatic - Block on bypass after 6 commutations within 2 min. - Reset by front panel or by remote command
Overload Capability	-200% Continously -1000% For 1 Cicle
Manual By-Pass	Standard: - Electronically controlled - No break
Back-feed protection	Included as standard

DESCRIPTION:

- The back feed protection minimizes the danger caused by the inverter voltage feed back in case of by-pass fault.
- 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.

PARALLEL

Automatic Parallel Redundant Configuration	Up to four by an additional card
Parallel Configuration	Redundant N-1 on N
Connection Type	CAN Bus Loop
Share Accuracy	10% max unbalancement
Maximum Distance Between two Units	100 mt
Overload Capability	N x 200% Continuously
Automatic By-Pass	On each unit
Manual By-Pass	On each unit (common as option)

DESCRIPTION:

- The parallel control is full digital and acts on both active and reactive power on each output phase.
- The Loop connection permits to disconnect one of the units from the parallel string allowing the normal operation of the remaining units.
- The can bus communication allows to connect the units by a DB9 standard connector.

ALARMS,CONTROLS AND SIGNALS

LOCAL ON THE "SYSTEM CONTROL PANEL" :

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

REMOTE ON PC (by the means of a special test software):

- All the local indications alarms and measures
- Battery test functions
- Basic troubleshooting

FREE CONTACTS (by the means of an additional card):

- Eight signals are available on free contacts.

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

OPTIONS

1. BATTERY TEMPERATURE VOLTAGE COMPENSATION
2. INSULATION TRANSFORMER
3. FREE CONTACTS CARD
4. SNMP
5. RS-485 MOD-BUS PROTOCOL
6. PARALLEL CARD INTERFACE
7. MODEM