

**UPS  
QUASAR  
5 ÷ 40 kVA**

**DT 0251-E06**

**Document : DT0251 PTX English**

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## INTRODUCTION

Present document defines technical specs of a three phase UPS named *QUASAR* covering the power range from 5 to 40 kVA ON-LINE DOUBLE CONVERSION Uninterruptible Power Supply Systems with forced ventilation cooling. These equipments are characterized by reduced size and high efficiency, thanks to the conversion topology, which doesn't need transformers between mains, inverter and load.

*QUASAR UPS* belongs to the "double conversion" equipments family, with all advantages given by this topology and without any penalty in total efficiency.

All sizes have the same cubicle.

Following is shown the picture of the system :



## GENERAL FEATURES

- Double conversion, digital controlled, high frequency transformer less design.
- Internal battery
- Design standards IEC-EN62040-1, IEC-EN62040-2, IEC-EN62040-3
- IEC 950

Data communication protocol featuring:

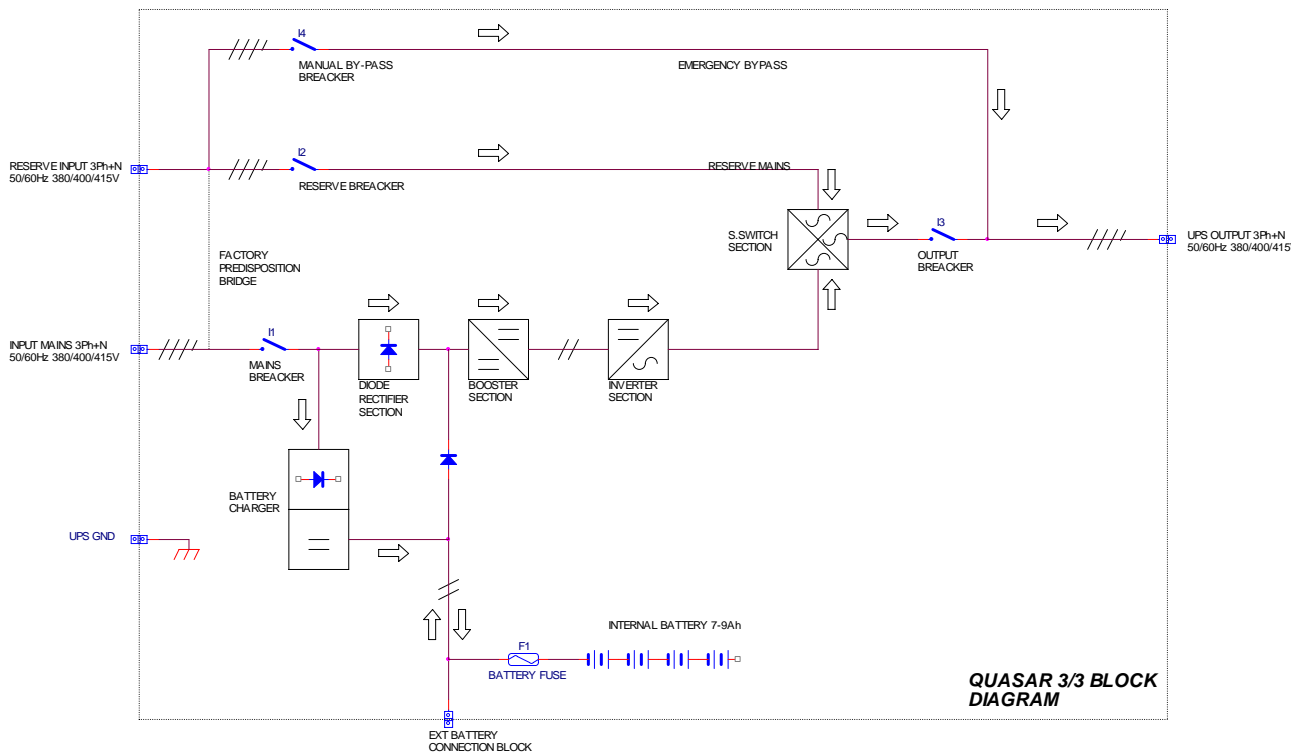
- User friendly front panel with integrated EPO
- Remote EPO available
- RS232 9 pins D type connector
- Software designed for most existing platforms (Windows, Novell, Unix, OS/2, MacOS)

Mechanical design according to Powertronix style guidelines and featuring:

- Bottom cable entry
- Gladding for armoured cabling
- No side access required
- Input protection to IP20
- Service access fully from the front

ONE LINE DIAGRAM:

On this page is given the key block of UPS



**Descriptions :**

1. Rectifier bridge
2. Booster IGBT (step-up)
3. Inverter Power IGBT
4. Static Switch
5. Manual By-Pass
6. Battery Charger
7. Internal Batteries (max 4 series 7-9Ah)

## REGULATIONS AND STANDARDS

This UPS family is designed according to the following regulations and standards:

Electromagnetic compatibility CE 2004/108

CEI-EN 62040-1-1:	Uninterruptible power systems (UPS) Part 1-1: General and safety requirements for UPS used in operator access area
CEI EN 62040-1-2:	Uninterruptible power systems (UPS) Part 1-2: General and safety requirements for UPS used in restricted access locations
CEI EN 62040-2:	Uninterruptible power systems (UPS) Part 2: Electromagnetic compatibility (EMC) requirements
CEI EN 62040-3:	Uninterruptible power systems (UPS) Part 3: Method of specifying the performance and test requirements
STANDARD CEI-EN 60950:	Information technology equipments

## GENERAL DATA

### QUASAR 5 ÷ 40 kVA

#### GENERAL

Configuration	On-Line Double Conversion
Nominal Input Voltage	3ph + N 380Vac 400Vac 415Vac
Inverter	H.F. Technology IGBT switching TrafoLess
S. Switch	Electronic static switch
Cooling system	Forced air

#### MECHANICAL

Housing	Dedicated UPS cabinet
Colour	RAL7035
Grade of protection	IP20
Recommended distances for placement	See pages from 24 to 27
Entry cables	Front from below
Size	530 x 950 x 1230 mm (h x l x p)

#### ENVIRONMENTAL CONDITIONS

Operating temperature	0-40° C
Temperature recommended for batteries	+20 ÷ +30 °C
Relative humidity	< 95% (without condensing)
Maximum altitude	Until 1000 m usl (1% downgrading every 100m from 1000 a 2000)
Storage temperature	-20°+ 70°C (UPS) +20°C ÷ 30°C (battery)

#### DISPLAY

LCD-Display	Display LCD four lines x 20 characters end four function keys + local EPO
Bright alarms	Led status green UPS OK/ Led status red ALARM
Acoustic alarms	Yes

#### COMMUNICATION

RS232	1 Serial standard
Free contacts	N° 4 contact: UPS in operation / UPS in bypass/mains present /battery end discharge
Battery end discharge SNMP SLOT	Yes
Maintenance Software	RS232
Parallel communication	RS232 Optic

## GENERAL DATA

### QUASAR 5 ÷ 40 kVA

#### BATTERY

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Nominal voltage	384 VDC.
Floating voltage	432 VDC.
N° of elements	192
Periodic battery test	Yes/ Programmable
Type of internal battery	5Ah/7Ah/9Ah.
Variation allowed Vbatt.	320-500 Vdc
Max recharge battery Current	7 Amps
Current recharge	1-3-5-7A selectable
Characteristics of recharge	DIN 41773
Stability of Vdc of battery charge	+/- 1%
Alternating residual in continue tension - (Vrms/Vb) x 100	< 1%
Battery Pre-alarm	Adjustable 350Vdc recommended

#### WEIGHTS

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Weight UPS without Battery (Kg)	Until 30 kVA 240 Kg – 40 kVA 290 Kg
Weight UPS with Battery (Kg)	Until 30 kVA 600 Kg – 40 kVA 650 Kg

#### ENVIROMENT CONDITION

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Deletion noise radio	IEC-EN62040-2 CLASS A
noise at 1m of distance	< 52 dBA until 30KVA - <63dBA per 40KVA

#### OPTIONAL

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Extension of battery	Separated cabinet for 30 minutes end 1 hours in all configuration
Transformer	For galvanic isolation (separated cabinet).
Shutdown	Powershut Plus.
Software for diagnostic	Generex PTX.
SNMP-Adapter	Link the UPS on the net.
Remote panel	For indicate the status of the UPS at the distance
Relays board	
Relays contacts available on TagBlock	250Vac/8A Mains present Inverter in function Prealarm of battery Load on reserve

**TYPE kVA**
**5**

Configuration	Standard	12 pulse	12 pulse + Low THD
Power factor	0.8	0.8	0.8

**INPUT**

Input frequency	50÷60Hz +/- 20%		
Number of phases	3PH + N		
Nominal voltage	3ph + N 380/400/415 VAC ±10%		
Reserve Nominal voltage	3ph + N 380/400/415 VAC ±20%		
Nominal frequency	50/60 Hz		
Frequency variation allowed	40/70 Hz		
Max Current absorbed (A) (Vin = -20% 400V )	12.5		
Input current distortion	<28%	<10%	<5%
Soft start	10 sec.		

**OUTPUT**

Number of phases	3PH + N		
Output nominal voltage	3ph + N 380/400/415 VAC		
Output nominal current (A) (400Vnom.)	7.21		
Static variation of the output voltage	±1% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Dynamic variation of the output voltage (0-100% load)	±5% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Output frequency	50/60 Hz		
Synchro tolerance	+/- 1%, +/-4% selectable		
Max Slew Rate whit the main present	± 1 Hz for sec		
Precision of the output frequency with internal oscillator	± 0,005 Hz		
Vout Waveform	Sinusoidal (UPS Class 1 CEI/IEC 62040-3 par 5.3.1.2)		
Output THD with linear load	< 7%		
Output THD whit distorted load	UPS Class 1 (CEI/IEC 62040-3 par 6.3.8.1)		
Efficiency according to load	See chart PERFORMANCE/LOAD pag. 10		
Maximum total losses (W) whit battery charger in Charge MAX			
Power consume whitout load (W)			
Admitted Inverter Overload	125% for 10 minutes; 150% per 5 seconds		
Autonomy with the internal battery	18 ÷ 105 min.		
Symmetry of the tension			
Static whit balanced load	< 1%		
Static whit unbalanced load 50%	< 3%		
Static whit unbalanced load 100%	< 5%		
Dynamic variation of 50% of load	< 3%		
Dynamic variation of 100% of load	< 4%		

TYPE kVA

5

**BYPASS**

Nominal voltage	3ph + N	380/400/415 VAC	±20%
	1ph + N	220/230/240 VAC	±20%
Tolerance of tension		±10%	
Frequency		50/60 Hz	
Overload in current admitted		150% 30 minutes	1000% 100ms.
Maximum temp of communication			
Inverter-Bypass		<1ms	
Bypass – Inverter automatic return		<1ms	
Overload / Failure		<5ms	
Manual by pass		Available with mechanical blocks	

**TYPE kVA**
**10**

Configuration	Standard	12 pulse	12 pulse + Low THD
Power factor	0.8	0.8	0.8

**INPUT**

Input frequency	50÷60Hz +/- 20%		
Number of phases	3PH + N		
Nominal voltage	3ph + N 380/400/415 VAC ±10%		
Reserve Nominal voltage	3ph + N 380/400/415 VAC ±20%		
Nominal frequency	50/60 Hz		
Frequency variation allowed	40/70 Hz		
Max Current absorbed (A) (Vin = -20% 400V )	18.5		
Input current distortion	<28%	<10%	<5%
Soft start	10 sec.		

**OUTPUT**

Number of phases	3PH + N		
Output nominal voltage	3ph + N 380/400/415 VAC		
Output nominal current (A) (400Vnom.)	15		
Static variation of the output voltage	±1% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Dynamic variation of the output voltage (0-100% load)	±5% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Output frequency	50/60 Hz		
Synchro tolerance	+/- 1%, +/-4% selectable		
Max Slew Rate whit the main present	± 1 Hz for sec		
Precision of the output frequency with internal oscillator	± 0,005 Hz		
Vout Waveform	Sinusoidal (UPS Class 1 CEI/IEC 62040-3 par 5.3.1.2)		
Output THD with linear load	< 7%		
Output THD whit distorted load	UPS Class 1 (CEI/IEC 62040-3 par 6.3.8.1)		
Efficiency according to load	See chart PERFORMANCE/LOAD pag. 10		
Maximum total losses (W) whit battery charger in Charge MAX			
Power consume whitout load (W)			
Admitted Inverter Overload	125% for 10 minutes; 150% per 5 seconds		
Autonomy with the internal battery	18 ÷ 105 min.		
Symmetry of the tension			
Static whit balanced load	< 1%		
Static whit unbalanced load 50%	< 3%		
Static whit unbalanced load 100%	< 5%		
Dynamic variation of 50% of load	< 3%		
Dynamic variation of 100% of load	< 4%		

TYPE kVA

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**BYPASS**

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Nominal voltage	3ph + N	380/400/415 VAC	±20%
	1ph + N	220/230/240 VAC	±20%
Tolerance of tension			±10%
Frequency			50/60 Hz
Overload in current admitted			150% 30 minutes 1000% 100ms.
Maximum temp of communication			
Inverter-Bypass			<1ms
Bypass – Inverter automatic return			<1ms
Overload / Failure			<5ms
Manual by pass			Available with mechanical blocks

**TYPE kVA**
**15**

Configuration	Standard	12 pulse	12 pulse + Low THD
Power factor	0.8	0.8	0.8

**INPUT**

Input frequency	50÷60Hz +/- 20%		
Number of phases	3PH + N		
Nominal voltage	3ph + N 380/400/415 VAC ±10%		
Reserve Nominal voltage	3ph + N 380/400/415 VAC ±20%		
Nominal frequency	50/60 Hz		
Frequency variation allowed	40/70 Hz		
Max Current absorbed (A) (Vin = -20% 400V )			
Input current distortion	<28%	<10%	<5%
Soft start	10 sec.		

**OUTPUT**

Number of phases	3PH + N		
Output nominal voltage	3ph + N 380/400/415 VAC		
Output nominal current (A) (400Vnom.)	28.9		
Static variation of the output voltage	±1% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Dynamic variation of the output voltage (0-100% load)	±5% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Output frequency	50/60 Hz		
Synchro tolerance	+/- 1%, +/-4% selectable		
Max Slew Rate whit the main present	± 1 Hz for sec		
Precision of the output frequency with internal oscillator	± 0,005 Hz		
Vout Waveform	Sinusoidal (UPS Class 1 CEI/IEC 62040-3 par 5.3.1.2)		
Output THD with linear load	< 7%		
Output THD whit distorted load	UPS Class 1 (CEI/IEC 62040-3 par 6.3.8.1)		
Efficiency according to load	See chart PERFORMANCE/LOAD pag. 10		
Maximum total losses (W) whit battery charger in Charge MAX			
Power consume whitout load (W)			
Admitted Inverter Overload	125% for 10 minutes; 150% per 5 seconds		
Autonomy with the internal battery	18 ÷ 105 min.		
Symmetry of the tension			
Static whit balanced load	< 1%		
Static whit unbalanced load 50%	< 3%		
Static whit unbalanced load 100%	< 5%		
Dynamic variation of 50% of load	< 3%		
Dynamic variation of 100% of load	< 4%		

TYPE kVA

15

**BYPASS**

Nominal voltage	3ph + N	380/400/415 VAC	±20%
	1ph + N	220/230/240 VAC	±20%
Tolerance of tension			±10%
Frequency			50/60 Hz
Overload in current admitted		150% 30 minutes 1000% 100ms.	
Maximum temp of communication			
Inverter-Bypass			<1ms
Bypass – Inverter automatic return			<1ms
Overload / Failure			<5ms
Manual by pass		Available with mechanical blocks	

**TYPE kVA**
**20**

Configuration	Standard	12 pulse	12 pulse + Low THD
Power factor	0.8	0.8	0.8

**INPUT**

Input frequency	50÷60Hz +/- 20%		
Number of phases	3PH + N		
Nominal voltage	3ph + N 380/400/415 VAC ±10%		
Reserve Nominal voltage	3ph + N 380/400/415 VAC ±20%		
Nominal frequency	50/60 Hz		
Frequency variation allowed	40/70 Hz		
Max Current absorbed (A) (Vin = -20% 400V )			
Input current distortion	<28%	<10%	<5%
Soft start	10 sec.		

**OUTPUT**

Number of phases	3PH + N		
Output nominal voltage	3ph + N 380/400/415 VAC		
Output nominal current (A) (400Vnom.)	28.8		
Static variation of the output voltage	±1% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Dynamic variation of the output voltage (0-100% load)	±5% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Output frequency	50/60 Hz		
Synchro tolerance	+/- 1%, +/-4% selectable		
Max Slew Rate whit the main present	± 1 Hz for sec		
Precision of the output frequency with internal oscillator	± 0,005 Hz		
Vout Waveform	Sinusoidal (UPS Class 1 CEI/IEC 62040-3 par 5.3.1.2)		
Output THD with linear load	< 7%		
Output THD whit distorted load	UPS Class 1 (CEI/IEC 62040-3 par 6.3.8.1)		
Efficiency according to load	See chart PERFORMANCE/LOAD pag. 10		
Maximum total losses (W) whit battery charger in Charge MAX			
Power consume whitout load (W)			
Admitted Inverter Overload	125% for 10 minutes; 150% per 5 seconds		
Autonomy with the internal battery	18 ÷ 105 min.		
Symmetry of the tension			
Static whit balanced load	< 1%		
Static whit unbalanced load 50%	< 3%		
Static whit unbalanced load 100%	< 5%		
Dynamic variation of 50% of load	< 3%		
Dynamic variation of 100% of load	< 4%		

TYPE kVA

20

**BYPASS**

Nominal voltage	3ph + N	380/400/415 VAC	±20%
	1ph + N	220/230/240 VAC	±20%
Tolerance of tension		±10%	
Frequency		50/60 Hz	
Overload in current admitted		150% 30 minutes	1000% 100ms.
Maximum temp of communication			
Inverter-Bypass		<1ms	
Bypass – Inverter automatic return		<1ms	
Overload / Failure		<5ms	
Manual by pass		Available with mechanical blocks	

**TYPE kVA**
**25**

Configuration	Standard	12 pulse	12 pulse + Low THD
Power factor	0.8	0.8	0.8

**INPUT**

Input frequency	50÷60Hz +/- 20%		
Number of phases	3PH + N		
Nominal voltage	3ph + N 380/400/415 VAC ±10%		
Reserve Nominal voltage	3ph + N 380/400/415 VAC ±20%		
Nominal frequency	50/60 Hz		
Frequency variation allowed	40/70 Hz		
Max Current absorbed (A) (Vin = -20% 400V )			
Input current distortion	<28%	<10%	<5%
Soft start	10 sec.		

**OUTPUT**

Number of phases	3PH + N		
Output nominal voltage	3ph + N 380/400/415 VAC		
Output nominal current (A) (400Vnom.)	36		
Static variation of the output voltage	±1% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Dynamic variation of the output voltage (0-100% load)	±5% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Output frequency	50/60 Hz		
Synchro tolerance	+/- 1%, +/-4% selectable		
Max Slew Rate whit the main present	± 1 Hz for sec		
Precision of the output frequency with internal oscillator	± 0,005 Hz		
Vout Waveform	Sinusoidal (UPS Class 1 CEI/IEC 62040-3 par 5.3.1.2)		
Output THD with linear load	< 7%		
Output THD whit distorted load	UPS Class 1 (CEI/IEC 62040-3 par 6.3.8.1)		
Efficiency according to load	See chart PERFORMANCE/LOAD pag. 10		
Maximum total losses (W) whit battery charger in Charge MAX			
Power consume whitout load (W)			
Admitted Inverter Overload	125% for 10 minutes; 150% per 5 seconds		
Autonomy with the internal battery	18 ÷ 105 min.		
Symmetry of the tension			
Static whit balanced load	< 1%		
Static whit unbalanced load 50%	< 3%		
Static whit unbalanced load 100%	< 5%		
Dynamic variation of 50% of load	< 3%		
Dynamic variation of 100% of load	< 4%		

TYPE kVA

25

**BYPASS**

Nominal voltage	3ph + N	380/400/415 VAC	±20%
	1ph + N	220/230/240 VAC	±20%
Tolerance of tension		±10%	
Frequency		50/60 Hz	
Overload in current admitted		150% 30 minutes	1000% 100ms.
Maximum temp of communication			
Inverter-Bypass		<1ms	
Bypass – Inverter automatic return		<1ms	
Overload / Failure		<5ms	
Manual by pass		Available with mechanical blocks	

**TYPE kVA**
**30**

Configuration	Standard	12 pulse	12 pulse + Low THD
Power factor	0.8	0.8	0.8

**INPUT**

Input frequency	50÷60Hz +/- 20%		
Number of phases	3PH + N		
Nominal voltage	3ph + N 380/400/415 VAC ±10%		
Reserve Nominal voltage	3ph + N 380/400/415 VAC ±20%		
Nominal frequency	50/60 Hz		
Frequency variation allowed	40/70 Hz		
Max Current absorbed (A) (Vin = -20% 400V )			
Input current distortion	<28%	<10%	<5%
Soft start	10 sec.		

**OUTPUT**

Number of phases	3PH + N		
Output nominal voltage	3ph + N 380/400/415 VAC		
Output nominal current (A) (400Vnom.)	43.4		
Static variation of the output voltage	±1% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Dynamic variation of the output voltage (0-100% load)	±5% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Output frequency	50/60 Hz		
Synchro tolerance	+/- 1%, +/-4% selectable		
Max Slew Rate whit the main present	± 1 Hz for sec		
Precision of the output frequency with internal oscillator	± 0,005 Hz		
Vout Waveform	Sinusoidal (UPS Class 1 CEI/IEC 62040-3 par 5.3.1.2)		
Output THD with linear load	< 7%		
Output THD whit distorted load	UPS Class 1 (CEI/IEC 62040-3 par 6.3.8.1)		
Efficiency according to load	See chart PERFORMANCE/LOAD pag. 10		
Maximum total losses (W) whit battery charger in Charge MAX			
Power consume whitout load (W)			
Admitted Inverter Overload	125% for 10 minutes; 150% per 5 seconds		
Autonomy with the internal battery	18 ÷ 105 min.		
Symmetry of the tension			
Static whit balanced load	< 1%		
Static whit unbalanced load 50%	< 3%		
Static whit unbalanced load 100%	< 5%		
Dynamic variation of 50% of load	< 3%		
Dynamic variation of 100% of load	< 4%		

TYPE kVA

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**BYPASS**

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Nominal voltage	3ph + N	380/400/415 VAC	±20%
	1ph + N	220/230/240 VAC	±20%
Tolerance of tension			±10%
Frequency			50/60 Hz
Overload in current admitted			150% 30 minutes 1000% 100ms.
Maximum temp of communication			
Inverter-Bypass			<1ms
Bypass – Inverter automatic return			<1ms
Overload / Failure			<5ms
Manual by pass			Available with mechanical blocks

**TYPE kVA**
**40**

Configuration	Standard	12 pulse	12 pulse + Low THD
Power factor	0.8	0.8	0.8

**INPUT**

Input frequency	50÷60Hz +/- 20%		
Number of phases	3PH + N		
Nominal voltage	3ph + N 380/400/415 VAC ±10%		
Reserve Nominal voltage	3ph + N 380/400/415 VAC ±20%		
Nominal frequency	50/60 Hz		
Frequency variation allowed	40/70 Hz		
Max Current absorbed (A) (Vin = -20% 400V )			
Input current distortion	<28%	<10%	<5%
Soft start	10 sec.		

**OUTPUT**

Number of phases	3PH + N		
Output nominal voltage	3ph + N 380/400/415 VAC		
Output nominal current (A) (400Vnom.)	57.73		
Static variation of the output voltage	±1% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Dynamic variation of the output voltage (0-100% load)	±5% (UPS Class 1 CEI/IEC 62040-3 par 5.3.1)		
Output frequency	50/60 Hz		
Synchro tolerance	+/- 1%, +/-4% selectable		
Max Slew Rate whit the main present	± 1 Hz for sec		
Precision of the output frequency with internal oscillator	± 0,005 Hz		
Vout Waveform	Sinusoidal (UPS Class 1 CEI/IEC 62040-3 par 5.3.1.2)		
Output THD with linear load	< 7%		
Output THD whit distorted load	UPS Class 1 (CEI/IEC 62040-3 par 6.3.8.1)		
Efficiency according to load	See chart PERFORMANCE/LOAD pag. 10		
Maximum total losses (W) whit battery charger in Charge MAX			
Power consume whitout load (W)			
Admitted Inverter Overload	125% for 10 minutes; 150% per 5 seconds		
Autonomy with the internal battery	18 ÷ 105 min.		
Symmetry of the tension			
Static whit balanced load	< 1%		
Static whit unbalanced load 50%	< 3%		
Static whit unbalanced load 100%	< 5%		
Dynamic variation of 50% of load	< 3%		
Dynamic variation of 100% of load	< 4%		

TYPE kVA

40

**BYPASS**

Nominal voltage	3ph + N	380/400/415 VAC	±20%
	1ph + N	220/230/240 VAC	±20%
Tolerance of tension		±10%	
Frequency		50/60 Hz	
Overload in current admitted		150% 30 minutes	1000% 100ms.
Maximum temp of communication			
Inverter-Bypass		<1ms	
Bypass – Inverter automatic return		<1ms	
Overload / Failure		<5ms	
Manual by pass		Available with mechanical blocks	

## UPS CONFIGURATIONS

All the sizes are available in the following configurations :

- Three phases input / single phase output
- Three phases input / three phases output
- Stand alone
- Hot stand-by
- Parallel mode or power parallel

The parallel configuration is type bypass distributed.

It is possible to have maximum n°8 unit in parallel.

The communications between the unit of the parallel system is ring type by optical fibres.

## UPS USER INTERFACE

LCD display 4 rows x 20 characters and 4 functions buttons + local EPO

Measures :

- Input Voltage
- Output Voltage
- Input Frequency
- Battery Voltage
- Battery back-up time
- Input Currents
- Output Currents
- Output Frequency
- Battery Current with sign

## UPS REMOTE PANEL

The signals transferred are the following :

- *Inverter Run*
- *On automatic Bypass*
- *Mains Present*
- *Battery Low*

Serial Interface:

CS121 SNMP ADAPTER per il collegamento in rete dell'UPS.

RS 232 port to be connected to a local PC, which has to be equipped with UPSMAN software.

DIMENSION AND POSITONING

