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1 System Data

System Data	UPS Power Rating			
	10	15	20	25
System configuration	On-line			
Nominal input voltage	3x380/400/415 V Tolerance: $\pm 10\%$			
Nominal input frequency	50 (60) Hz Tolerance: $\pm 5\%$			
Nominal output voltage	220 V, 230 V, 240 V			
Nominal output frequency	50 (60) Hz			
Output volt. dist. (THD), linear load Output volt. dist. (THD), non linear load	< 1,5% < 4% (CF $\leq 3:1$)			
Output voltage tolerances static dynamic	$\pm 1\%$ $\pm 10\%$			
Output frequency tolerance mains synchronisation (adjustable) free running	$\pm 0,5 / 1 / 1,5 / 2$ Hz $\pm 0,01\%$			
Rated output power (p.f.=0,8lag.) [kVA]	10	15	20	25
Rated output power (p.f.= 1,0) [kW]	8	12	16	20
System efficiency at rated load [%]	90	90	91	91
Losses at nominal load [kW]	1	1,5	1,8	2,2
Overload capability Inverter Static bypass switch	125 % 10 minutes, 150 % 1 minute 2000 % full load for 20 ms, 200 % 1 minute, 150 % continually			
Permissible inverter output voltage variation for bypass switching	$\pm 15\%$ (adjustable)			
Design standards	IEC, VDE, SEV			
Insulation test for 60 sec.	2,0 kV			
Voltage transient protection	Complies with VDE 0160			
Enclosure	IP 30 acc. to DIN 40050 excl. air exit			
Ambient temperature for operation for storage	0 to 40 °C -20 to 85 °C (excl. battery)			
Permissible relative humidity	95 %			
Permissible altitude above sea level at full load	1500 m. Higher altitudes require power derating or increased cooling			
EMC Compatibility	Complies with EN 50091-2 (1995)			
Audible noise level <= [db(A)]	60	60	60	60

FIG. 1.1 - System Data

2 Rectifier Data

Rectifier Data	UPS Power Rating			
	10	15	20	25
Input voltage Tolerance with reduced output DC-voltage	refer to system data -10 % -20 %			
Input frequency Tolerance	refer to system data ± 5 %			
Rated input power with charged battery [kVA]	10,9	16,3	21,8	27,2
Rated input current with charged battery (at 380 V) [A]	17	25	34	42
Maximal input power (rated output power & max. recharging current) [kVA]	13,6	20,4	27,2	34,0
Maximal input current at max. input power (at 380 V) [A]	21	31	41	51
Input power factor (100 % load, 380 V input voltage)	~ 0,8 lagging			
Output control characteristic	I/U characteristic			
Rated output voltage	432 VDC			
Range of adjustment of floating voltage	± 25 %			
Soft start	2 seconds			
Tolerance of floating voltage	1 %			
Voltage ripple with battery disconnected	RMS 1 %			
Max. battery discharge current (VDC = 320 V, nominal load) [A]	27	41	54	69
Max. battery charger current at rated load [A]	5	7,5	10	12,5
Battery charge current limitation	complies with battery manufacturer's recommendations, standard setting app. 10 % of rated 10h battery capacity			

FIG. 2.1 - Rectifier Data

3 Battery Data

Battery Data	UPS Power Rating			
	10	15	20	25
Capacity [Ah]	24	24	24	24
Autonomy times at full load				
24Ah	30	20	12	6
38Ah	50	33	22	12
65Ah	100	67	45	25
[min]				
Number of cells (standard)				
Lead open	192			
Sealed lead maintenance free	192			
Ni-Cd	300			
Floating voltage at 20°C				
Lead open 2,25 V/Cell	432			
Sealed lead 2,27 V/Cell	436			
Ni-Cd 1,42 V/Cell	426			
[VDC]				
Minimum battery voltage				
lead 1,68 V/Cell	322			
Ni-Cd 1,06 V/Cell	320			
[VDC]				
Recommended charging current	10 % of rated 10h battery capacity			
Protections	- batt. protection disconnecter switch *1) - automatic shutdown of the inverter at min. DC-voltage			
Permissible DC voltage range [VDC]	min. 320 max. 462			
Floating voltage adjustment range	± 25 % of nominal value (manual)			
Ambient temperature	follow battery manufacturer`s instructions			
1) battery disconnecter fuse for free standing battery optional				

FIG. 3.1 - Battery Data

4 Inverter Data

Inverter Data	UPS Power Rating			
	10	15	20	25
Permissible input DC-voltage range	320 - 480 VDC			
Input power at rated load [kW]	8,7	13	17,4	21,8
Inverter input current at 320 VDC and rated load [A]	27	41	54	69
Nominal output current at rated load (380 V, p.f.= 0,8) [A]	45,5	68,2	91	113,6
Nominal output current (380 V, p.f.= 1,0) [A]	36,4	54,5	77,7	90,9
Efficiency at rated load [%]	92	92	92,5	93
Load power factor range at nominal load at reduced load	0,7 - 0,8 lag. 0,5 lag. - 0,5 Lead.			
Output voltage	refer to system data			
Output voltage distortion THD	refer to system data			
Voltage adjustment range	± 5 % of programmable nominal value			
Voltage tolerances static dynamic	± 1 % ±10 %			
Voltage transient recovery time	<= 40 ms to within ±2 % of output voltage			
The unit is short circuit proof (Short circuit current)	150 % of nominal current			
Frequency adjustment range	± 2 Hz			
Max. frequency variation during synchronisation	± 1 Hz/sec.			

FIG. 4.1 - Inverter Data