

**UPS Technical Specification**  
**Manufacturer's declaration in accordance with IEC 62040-3**

<i>Subclause</i>	<i>Characteristic of Equipment</i>	<i>Manufacturer's Declared Values</i>
<b>CONSTRUCTION</b>		
	Model catalogue reference	<u>UPS cabinet with number of BAT strings:</u> Powerware 9155-20-N-0 Powerware 9155-20-N-xx-1-xxxxx-xxx Powerware 9155-20-N-xx-2-xxxxx-xxx Powerware 9155-20-N-xx-3-xxxxx-xxx Powerware 9155-20-N-xx-4-xxxxx-xxx  <u>Battery cabinets:</u> Powerware 9X55-BAT-0 Powerware 9X55-BAT-1x24 Ah Powerware 9X55-BAT-2x24 Ah
	Model rating	20 kVA or 18 kW @ 230 Volts
	Classification	VFI-SS-111
MIL 217	MTBF	150 000 h
	Dimensions length x depth x height	494 x 762 x 1684 mm (UPS) 494 x 758 x 1684 mm (battery cabinet)
	Weight without/with batteries	185 kg (UPS without batteries) 285 kg (UPS + 1 bat string) 385 kg (UPS + 2 bat strings) 485 kg (UPS + 3 bat strings) 585 kg (UPS + 4 bat strings) +15 kg (MBS option if selected)
	Weight without/with batteries	150 kg (empty) 510 kg (1 bat string) 870 kg (2 bat string)
<b>ENVIRONMENTAL</b>		
4.1.4	Ambient storage temperature range	-25 to +55°C in the protective package
4.1.2	Ambient service temperature	<u>Power electronics part:</u> +0 to +45°C <u>Battery part:</u> +5 to +25°C without reducing the life time;
4.1.1	Maximum service altitude	1000 m (3300 ft) above sea level, max. 2000 m (6600 ft) with 1% derating per +100 m (330 ft)
4.1.3	Relative humidity range	5 to 95%, no condensation allowed
EN 60529	Degree of protection	IP20
7.3	Acoustic noise at 1 m - Normal mode - Stored energy	50 dBA 55 dBA
<b>ELECTRICAL CHARACTERISTICS – INPUT</b>		
5.2.2 and 6.3.2.1	Rated input voltage and voltage tolerance	Rectifier input: 3x230/400 V nominal; <u>Tolerance:</u> 196/340-276/480 (-15%, +20%) at 100% load Bypass input: 230 V nominal; <u>Tolerance:</u> 196-253 V (-15%, +10%)
5.2.2 and 6.3.2.2	Rated input frequency and frequency tolerance	50 or 60 Hz, tolerance 45-65 Hz
5.2.2 and 6.3.10	Rated input current	28.1 A r.m.s (three phase input)
5.2.2 and 6.3.9.2	Maximum input current	56 A r.m.s (three phase input)
5.2.2	Input current distortion at rated input current	5% THD
5.2.2 and 6.3.10	Input power factor	0.99

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5.2.2 and 6.3.3	Inrush current	<100% of rated current
5.2.2	Number of input phases	3 Phases + N (three phase input)
<b>OUTPUT WAVEFORM</b>		
5.3.1.2	Waveform – Normal mode	Sine waveform
5.3.1.2	Waveform – Stored energy mode	Sine waveform
	Transfer – Normal mode / Stored energy	No break
	Break time / make time	No break
<b>ELECTRICAL OUTPUT CHARACTERISTICS - STATIC CHARACTERISTICS - NORMAL MODE</b>		
5.3.2	Rated output voltage	220, 230 (default), 240 Vac
	Output voltage variation	$\pm 2$ V r.m.s / $\pm 1\%$
	Crest factor	3
	Rated output frequency (nominal)	50 (default) or 60 Hz
6.3.2.2	Output frequency variation (synchronised if applicable)	$\pm 2$ (default), $\pm 0.5$ , or $\pm 1$ Hz with slew rate 1 Hz/s (default), 7 Hz/s, 3 Hz/s, 2 Hz/s, or $\pm 0.5$ Hz/s
6.3.2.3	Output frequency synchronised phase error at change of mode	Max. 8 degrees
	Rated output apparent power	20 kVA
	Rated output active power across linear load	18 kW
	Rated output active power across a reference (p.f. 0.7) non-linear load	14 kW
6.3.4.2	Total voltage distortion across a linear load	< 1%
6.3.8.1	Total voltage distortion across a reference non-linear load	< 5%
6.3.4.2	Individual harmonics voltage	See separate declaration
5.3.2 and 6.3.5.3	Short circuit capability	300 A, < 300 ms
5.3.2 and 6.3.5.1	Overload capability	<p><b>Without bypass:</b></p> <p>10 min &gt;100...110% (29.7 kW) load  1 min &gt;110...125% (33.8 kW) load  5 sec &gt;125...150% (40.5 kW) load</p> <p><b>With bypass:</b></p> <p>Continuous &gt;100...125% load  10 min &gt;125...150% load  5 ms 1000% load</p> <p><b>Note!</b>  Selected bypass fuses may limit the overload capability.</p>
5.3.2 and 6.3.4	Range of load power factor permitted - linear load	0.7 lagging – 0.8 leading
	Number of output phases	1 Phase
5.3.2 and 6.3.4.5	Output voltage unbalance at reference unbalance load (multiphase only)	-
5.3.2 and 6.3.4.5	Maximum phase angle variation (multiphase only)	-
<b>ELECTRICAL OUTPUT CHARACTERISTICS - DYNAMIC CHARACTERISTICS - NORMAL MODE</b>		
5.3.2 and 6.3.6.1 and 6.3.6.2	Output voltage dynamic variation during transfer normal/stored energy mode of operation and vice versa	0%

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6.3.7.1 and 6.3.8.4	Output voltage dynamic variation due to load changes	± 5% with 1 ms recovery (from 10% to 90% load step)
	Maximum rate of change of output frequency	0.5 (default), 2.5, or 7.5 Hz/s
<b>ELECTRICAL OUTPUT CHARACTERISTICS - STATIC CHARACTERISTICS - STORED ENERGY</b>		
5.3.1	Rated output voltage	220, 230 (default), 240 Vac
6.3.4.4	Output voltage variation	± 2 V r.m.s / ± 1%
	Crest factor	3
6.3.4.3	Rated peak output voltage	325 V
6.3.4.4	Rated peak output voltage variation	±20 V
5.3.1.2	Non-sinusoidal voltage rise time 0,1 to 0,9 peak (if waveform exceeds 0,5 V/μs)	-
5.3.2	Output frequency	50 Hz (default) or 60 Hz
5.3.2	Output frequency variation	±0,005 Hz (single), ±0,07 Hz (parallel)
5.3.2	Rated output apparent power	20 kVA
5.3.2	Rated output active power	18 kW
5.3.2	Rated output active power non-linear load	18 kW
6.3.4.4	Total output voltage distortion	5% THD
6.3.4.4	Individual harmonic voltages - linear load	-
6.3.2 and 6.3.8.2	Individual harmonic voltages - non-linear load	-
5.3.2 and 6.3.5.4	Short circuit capability	300 A, <300 ms
5.3.2 and 6.3.5.2	Overload capability	10 min >100...110% (29.7 kW) load 1 min >110...125% (33.8 kW) load 5 sec >125...150% (40.5 kW) load 300 ms >150% load
5.3.2	Range of load power factors permitted	0.7 lagging – 0.8 leading
5.3.2	Number of output phase (multiphase only)	1 Phase
<b>ELECTRICAL OUTPUT CHARACTERISTICS - DYNAMIC CHARACTERISTICS - STORED ENERGY</b>		
6.3.6.1	Output voltage dynamic variation during transfer from stored energy mode to normal mode	0%
6.3.7.1	Output voltage dynamic variation due to load changes	±5% with 1 ms recovery (from 10% to 90% load step)
<b>EFFICIENCY</b>		
6.6.11	Efficiency Input / Output	93% at 100% rated load 92% at 75% rated load 91% at 50% rated load 86% at 25% rated load
	Heat dissipation	1440 W at 100% rated load 1220 W at 75% rated load 900 W at 50% rated load
<b>SYNCHRONIZATION (if applicable)</b>		
6.3.6.4	Acceptable voltage difference	±25%

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6.3.2.2	Range of frequency synch	±2 (default), ±0.5, or ±1 Hz with slew rate 1 Hz/s (default), 7 Hz/s, 3 Hz/s, 2 Hz/s, or ±0.5 Hz/s
6.3.6.4	Maximum phase error	8 degrees
<b>5.4 STORED ENERGY MODE OF OPERATION</b>		
	Duration of maximum permitted stored energy time at rated load	No limit.
6.3.9.1	Stored energy time (for integral batteries) at rated load	See separate declaration
6.3.9.2	Restored energy time to 90% charge (for integral batteries) Battery rating and quantity (for integral battery) Battery recharge profile	Max. 10 h recommended  9 Ah and 36 units (VRLA), max. battery voltage 216*2.35V = 508 V  ABM = 90% resting, 10% float charging
6.3.9.1	Battery cut-off voltage	1.75 / 1.67 VPC
<b>5.8 CONTROL AND MONITORING SIGNALS</b>		
5.8	See separate declaration for complete list of indications and remote alarm/monitoring or interface devices	See User's Manual
<b>5.5.2 BYPASS CHARACTERISTICS</b>		
5.5.2	Type of bypass	Manual and Automatic
5.5.2	Mechanical/static	Mechanical Static
5.5.2	No break transfer / break transfer	No break
5.5.2	Break time / make time	No break
5.5.2	Maintenance bypass	Yes (optional without)
5.5.2	Bypass protection fuse or circuit-breaker rating	100 A
5.5.2	Galvanic isolation fitted	No
<b>5.7 ELECTROMAGNETIC COMPATIBILITY</b>		
	Immunity, see IEC 62040-2	Yes
	Emission, see IEC 62040-2	Yes