Technical data sheet

PowerLine DPA 3ph UPS
20-120 kVA

Document information

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Contents

1 System description

The PowerLine DPA is a three-phase uninterruptible power system (UPS). It is a true on-line double conversion UPS providing quality power for sensitive equipment in industrial environments. Its modular design consists of:

- *DPA UPS modules*
- *Maintenance bypass switch*
- *Incoming, outgoing and battery protection*
- *Dual input feed*
- *System graphical display*
- *Communication interfaces*
- *Halogen free cable (wiring)*

1.1 Identification

TYPE		NOMINAL POWER RATING	UNIT
PowerLine DPA	:	20	*kVA*
PowerLine DPA	:	40	*kVA*
PowerLine DPA	:	80	*kVA*
PowerLine DPA	:	120	*kVA*

Key features of PowerLine DPA:

Fail safe electrical design

- Patented decentralized parallel architecture (DPA) minimizing point of failure
- Protection against overload and short-circuit currents
- Galvanic isolation and step up-down voltage transformers (option)

Fail safe mechanical design

- Operational ambient temperature up 45°C without derating
- Protection against corrosive and dusty environments
- Modular design

Optimal performance

- Continuous operation 24/7 in rough environments
- Over 95% efficiency
- Long service life design (>15 years)

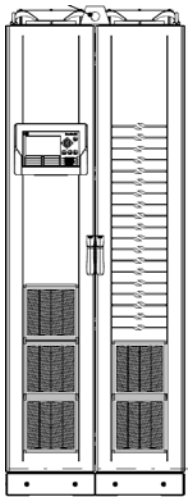
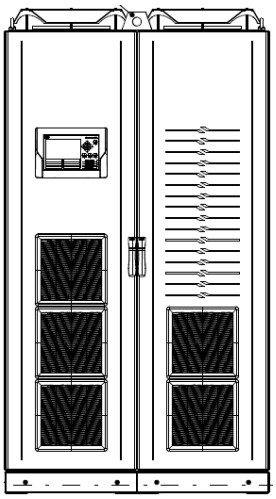
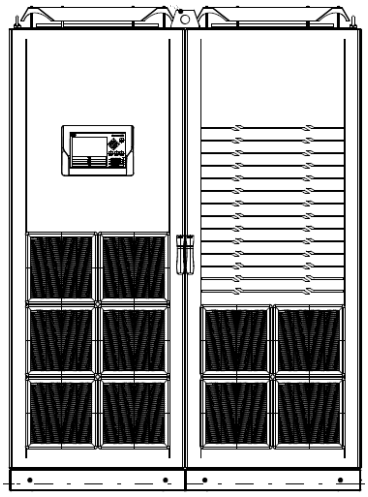
Efficient service concept

- Remote control and monitoring
- No downtime during maintenance
- Low Mean Time to Repair (< 60min)

2 Mechanical characteristics

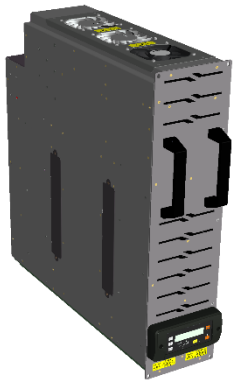
PowerLine DPA		VALUE	UNIT
Enclosure	:	The UPS is housed in a free-standing, fully metal enclosed cabinet arranged for floor mounting.	
Panel Thickness			
- Side and rear	:	20 / 10	*mm*
- Door	:	20 / 10	*mm*
Finishing	:	Galvanized and painted	
Color	:	RAL 7035	
Access	:	Front access only	
Cable entry	:	Bottom	
Protection class	:	IP31	
Ventilation	:	Forced ventilation	
Wiring	:	Halogen free cable	

2.1 Frame general arrangement

PowerLine DPA		20 / 40 kVA	80kVA	120 kVA	UNIT
Frame					
Number of modules	:	1	2	3	
Dimensions (WxDxH)	:	800x800x2200	1200x800x2200	1600x800x2200	*mm*
Weight **Transformerless UPS*	:	300	500	850	*kg*

2.2 DPA UPS module general arrangement

MODULE		VALUE	UNIT
Dimensions (WxDxH)	:	202x710x810	*mm*
Weight	:	68 / 55 (only for 20kVA module)	*kg*
Ventilation	:	Monitored fans with variable speed	
Redundant ventilation (N+N)	:	Optional	



3 Environmental characteristics

The following data declarations are valid for PowerLine DPA:

PowerLine DPA		VALUE	UNIT
Ambient temperature range	:	-5 to +45	*°C*
Derating power factor for high temperature	:	-5% / °C	
Relative humidity range	:	< 95% (non-condensing)	
Installation altitude with full rating ASL	:	1000	*m*
Derating power factor for installation altitude above 1000 m ASL	:	-5% / 1000	*m*
Audible noise at 1 m from front, 100% load	:	<70	*dBA*
Storage temperature	:	-25 - +70	*°C*
Overvoltage category	:	II	

4 Input rectifier characteristics

PowerLine DPA		20 kVA	40 kVA	80kVA	120kVA	UNIT
Nominal input voltage	:	3 x 400 / 230 + N				*V*
Other input voltage	:	On request				
Input voltage tolerance for loads in % (@ 45 °C)	:	(-15%/+10%) for 100% load (-20%/+10%) for < 80% load (-25%/+10%) for < 60% load				*V*
Earthing system	:	TN-S, TN-C, TT, IT (selectable)				
Input frequency	:	50 / 60 (selectable)				*Hz*
Frequency tolerance	:	-30 /+40				*%*
Total harmonic distortion (THDi)	:	4				*%*
Input power factor	:	0.99 @ 100% load				-
Inrush current without input transformer	:	< 100% of rated current				*A*
Inrush current with input/bypass transformer	:	<10 x In of rated current				
Rated short-time withstand current (I_{cw})	:	10 for 1.5 seconds				*kA*
Input protection MCCB, 3p with thermomagnetic unit (TMD)	:	60	125	200	250	*A*
Current (r.m.s), rated (with battery charged and input 400/230V)	:	31	61	121	182	*A*
Maximum input current	:	36	71	143	214	*A*
Recommended external protection (gG type)	:	63	125	200	250	*A*

5 Static Bypass characteristics

PowerLine DPA		20 kVA	40 kVA	80kVA	120kVA	UNIT
Nominal input voltage	:	3 x 400/230 + N				*V*
Other input voltage	:	On request				
Input voltage tolerance	:	-10%/ +10% (@ maximum output current)				*V*
Input frequency	:	50 / 60 (selectable)				*Hz*
Frequency tolerance	:	-4/+4 %, -2/+2 % (selectable)				*%*
Fault clearing capability (bypass mode)	:	10 x In for 20ms				*A*
Overload current on bypass mode (@ 40 °C)	:	110% of rated bypass current, continuous				
Static bypass transfer time: inverter → bypass / bypass → inverter /in bypass-mode	:	<1 / <5 / <6				*ms*
Bypass protection MCCB, 3p with thermomagnetic unit (TMD)	:	60	125	200	250	*A*
Bypass rated current	:	31	61	121	175	*A*
Maximum rated current	:	34	67	128	195	*A*
Recommended external protection (gG type)	:	63	125	200	250	*A*

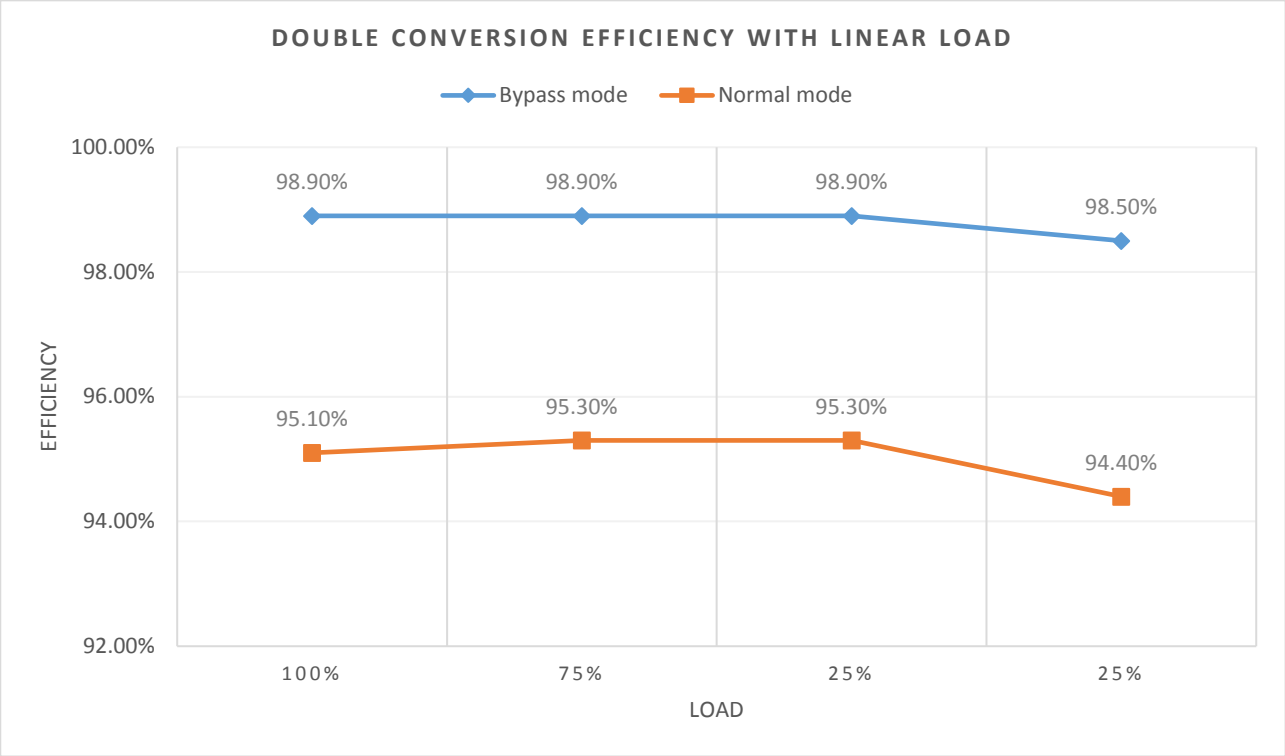
6 Battery characteristics

PowerLine DPA		20 kVA	40 kVA	80kVA	120kVA	UNIT
Battery type	:	VLRA, NiCd				
Number of battery blocks VLRA 12V	:	42-48				
Number of battery blocks NiCd 1.2V	:	420-480				
Floating voltage (VRLA / NiCd)	:	2.25 / 1.40				*Vdc*
End of discharge voltage (VRLA / NiCd)	:	1.65 / 1.05				*Vdc*
R.M.S. ripple current (percentage of the battery capacity)	:	2				*%*
Temperature compensation	:	optional				
Battery test	:	Automatic and periodically (adjustable)				
Max battery charger power capability	:	6	12	24	36	*kW*
Max battery charger current capability	:	12	24	48	72	*A*

7 System output characteristics

PowerLine DPA		20 kVA	40 kVA	80kVA	120kVA	UNIT
Output rated voltage	:	3 x 400/230				*V*
Output voltage stability	:	Static: Dynamic (step load 0%-100% or 100%-0%)			< +/- 1% < +/- 4%	%
Output voltage distortion	:	With linear load With nonlinear load (EN62040-3:2001)			< 2% < 4%	%
Output frequency	:	50 / 60 Hz (selectable)				*Hz*
Output frequency tolerance	:	Synchronized with mains (selectable for bypass operation) or Free running			< +/- 2% < +/- 4% +/- 0.1%	%
Output Power Factor **Transformerless*	:	0.95 / 1*				
Earthing system	:	TN-S, TN-C, TT, IT (selectable)				
Max synch phase error (referred to a 360° cycle)	:	<2				°
Max slew-rate	:	1				*Hz/s*
Overload capability on inverter (@ 40 °C), rectifier and battery available	:	110% load 125% load 150% load	30 min 10 min. 60 sec.			
Overload capability on inverter (@ 40 °C), on battery	:	110% load	30min			*A*
Output short capability on inverter (RMS) for 100ms	:	2.7x In				*A*
Output short term overload capability on static bypass (RMS) for 20ms	:	10 x In				
Double conversion efficiency in normal mode, linear load **Transformerless UPS*						%
100% load	:	95.3	95.5	95.5	95.5	%
75% load	:	95.2	95.3	95.3	95.3	%
50% load	:	95.0	95.3	95.3	95.3	%
25% load	:	93.2	94.4	94.4	94.4	%
Double conversion efficiency in bypass mode, linear load 100%	:	>98.5				%
Permissible unbalanced load (All three phases regulated independently)	:	100%				°
Phase angle tolerance (With 100% unbalanced load)	:	<2				
Crest factor (load supported)	:	3:1				

7.1 Double conversion efficiency in normal operating mode, linear load*



**Transformerless UPS, tolerance of 0.2% applies on all figures*

8 Standards

The product has the CE marking in compliance with the following European directives:

- Low Voltage Directive: 2014/35/EC
- EMC Directive: 2004/30/EC

Further ABB UPS systems are in compliance with following standards:

	Product Standards	Standards
Safety Standard:	IEC/EN 62040-1	IEC/EN 60950-1
Electromagnetic Compatibility Standard (EMC):	IEC/EN 62040-2 Emission cat. C3 Immunity cat. C3	IEC/EN 61000-6-2 IEC/EN 61000-6-4 IEC/EN 61000-4-2 IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6 IEC/EN 61800-4-8
Performance Standard:	IEC/EN 62040-3	

9 Control and monitoring

9.1 System graphical display

The system graphical display of the UPS has four sections:

1) Graphical display unit	The graphical display unit provides mimic diagram, monitoring and measurement information
2) Control & operating	Control keys allowing the operator to manipulate UPS settings
3) Main operating status indication	System operating status
4) Alarm indication	Shows the present faults in the system. The LED is activated as long as the alarm is present

9.1.1 Main operating status indication

Normal operation	The load is supplied from the inverter
Bypass operation	The load is supplier by static transfer switch (STS)
Battery operation	The battery supplies energy to the inverter and the load is supplied from the inverter-
Common alarm	

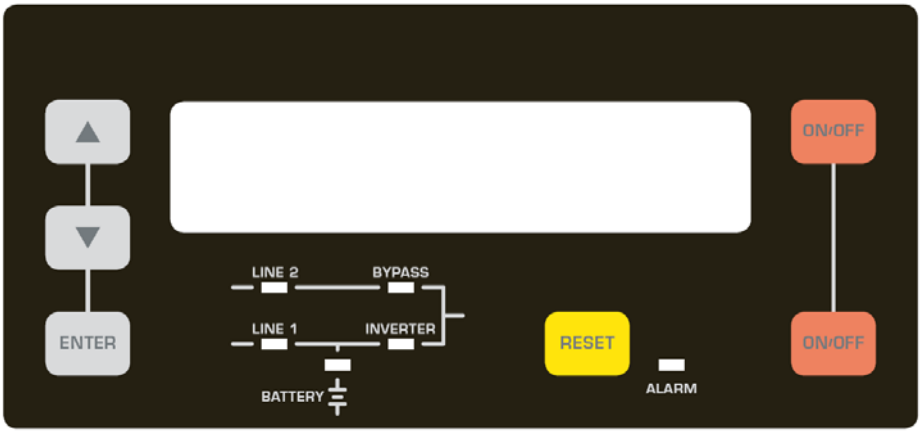
9.1.2 Alarm indication

LED	Alarm
1	Battery Low
2	Battery disconnected
3	Mains input failure
4	Bypass input failure
5	Maintenance bypass switch close
6	Over temperature
7	UPS Module Fan Failure
8	-

9.2 Service display panel

The DPA display and control panel module has three sections:

1. The LCD provides monitoring and measurement information
2. The mimic diagram delivers the general status of the UPS
3. Control keys allow the operator to manipulate UPS settings



9.3 Communication interfaces

9.3.1 Relay input and output board

RELAY INPUT SETTING	DESCRIPTION
Input 1	EPO
Input 2	programmable customer input
Input 3	programmable customer input
Input 4	Battery temperature sensor
Input 5	

RELAY OUTPUT SETTING (NC)	DESCRIPTION
Output 1	Mains input failure
Output 2	Battery low
Output 3	Battery disconnected
Output 4	Maintenance bypass switch closed
Output 5	Common alarm
Output 6	Bypass input failure
Output 7	Overtemperature
Output 8	Bypass operation
Output 9	Fan failure

10 Options

OPTIONS	
System	Cold start
Magnetics (Alu)	Input Transformer
	Bypass Transformer
	Output Transformer
Mechanics	Dust Filter
	Top cable entry
	Lifting eyes
	Anti-condensation heater
	Conformal coating
Control & monitoring	SNMP interface
	Modbus TCP/IP
	Modbus RS-485
	Synchronization kit
Battery	Temperature sensor

11 Heat dissipation with nonlinear load

**Transformer less UPS*

RATED POWER		20 KVA	
Heat dissipation with 100% non-linear load	*W*	1050	
Heat dissipation with 100% nonlinear load	*BTU/h*	3586	
Airflow (25° - 30°C) with 100% nonlinear load	m^3/h	700	UPS Frame
		natural	Incoming/Bypass Frame
Dissipation at no load	*W*	240	

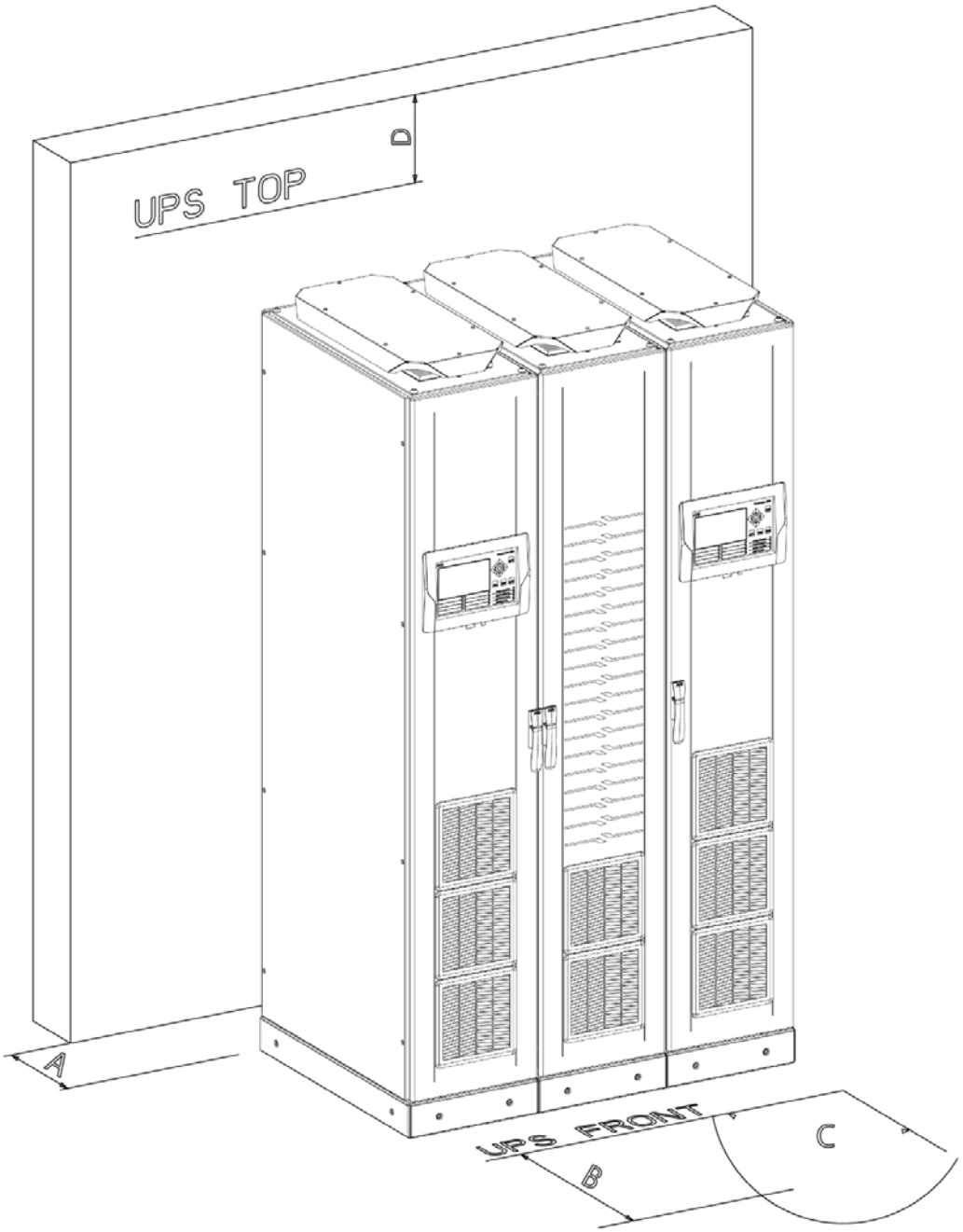
RATED POWER		40 KVA	
Heat dissipation with 100% non-linear load	*W*	2080	
Heat dissipation with 100% nonlinear load	*BTU/h*	7104	
Airflow (25° - 30°C) with 100% nonlinear load	m^3/h	800	UPS Frame
		natural	Incoming/Bypass Frame
Dissipation at no load	*W*	350	

RATED POWER		80 KVA	
Heat dissipation with 100% non-linear load	*W*	4100	
Heat dissipation with 100% nonlinear load	*BTU/h*	14002	
Airflow (25° - 30°C) with 100% nonlinear load	m^3/h	1600	UPS Frame
		natural	Incoming/Bypass Frame
Dissipation at no load	*W*	670	

RATED POWER		120 KVA	
Heat dissipation with 100% non-linear load	*W*	5654	
Heat dissipation with 100% nonlinear load	*BTU/h*	19311	
Airflow (25° - 30°C) with 100% nonlinear load	m^3/h	2400	UPS Frame
		natural	Incoming/Bypass Frame
Dissipation at no load	*W*	980	

12 Installation planning – UPS positioning

The minimum needed clearances to allow proper airflow on the UPS system and to allow proper service and maintenance shall be respected as reported below:



A	Back clearance	10 mm
B	Front clearance needed to allow a correct door opening	800 mm
C	Maximum door opening angle	120°
D	Top clearance (recommended to ensure sufficient space for air outlet)	300 mm
E	Side clearance	-

Contact us

www.abb.com/ups
ups.sales@ch.abb.com