



ИБП ABB DPA UPScale ST (10-200 кВт) - технические спецификации. Юниджет

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DPA UPSCALE™ ST 10 – 200 kW

Technical Specifications



TABLE OF CONTENTS

10.1	DPA UPScale ST SYSTEM DESCRIPTION	3
10.2	TECHNICAL CHARACTERISTICS	4
10.2.1	MECHANICAL CHARACTERISTICS FRAMES AND MODULES	4
10.3	INPUT CHARACTERISTICS	5
10.4	BATTERY CHARACTERISTICS	5
10.5	OUTPUT CHARACTERISTICS	6
10.5.1	GRAPH: AC – AC EFFICIENCY with Linear load @ cosphi 1	6
10.5.2	GRAPH: Output Power in kW and kVA VERSUS cosphi	7
10.6	ENVIRONMENTAL CHARACTERISTICS	8
10.7	STANDARDS	8
10.8	COMMUNICATION	9
10.8.1	POWER MANAGEMENT DISPLAY (PMD).....	9
10.8.2	MIMIC DIAGRAM.....	9
10.8.3	DISPLAY	9
10.8.4	CUSTOMER INTERFACES Terminals X1...X2	10
10.8.5	CUSTOMER INPUTS DRY PORT s: Terminal block X2.....	10
10.8.6	CUSTOMER OUTPUTS DRY PORTs : Terminal blocks X1	10
10.9	OPTIONS	11
10.9.1	SNMP card / WaveMon Management Software	11
10.9.2	BATTERY CABINETS	11
10.10	BATTERY AUTONOMIES	12
10.10.1	Examples of Internal Battery Autonomy of DPA UPScale ST40 and ST 60	12
10.10.2	Examples of External Battery Autonomy	13
10.11	INSTALLATION PLANNING – UPS POSITIONING –	14
10.11.1	HEAT DISSIPATION PER MODULE WITH NON-LINEAR LOAD	15
10.12	WIRING AND BLOCK DIAGRAMS FOR ALL FRAMES AND MODULES.....	16
10.12.1	TERMINAL CONNECTIONS OVERVIEW	16
10.12.2	SINGLE FEED INPUT	18
10.12.3	SINGLE FEED INPUT / Cable Sections	18
10.12.4	DUAL FEED INPUT	19
10.12.5	Dual FEED INPUT / Cable Sections.....	19

10.1 DPA UPScale ST SYSTEM DESCRIPTION

In environments that demand zero downtime, continuous power protection availability is essential. In order to respond to today's dynamic IT and process-related environments that experience daily change through new server technologies, migration and centralization, resilient and easily adaptable power protection concepts are required. DPA UPScale is the foundation for continuous power protection availability of network-critical infrastructures in enterprise data centers where business continuity has paramount importance and in process control environment where manufacturing continuity is essential.

DPA UPScale's is a second generation high-power-density (HPD), leading-edge double-conversion power protection technology that has standardized on a modular component approach which helps speed deployment, improve adaptability and increase system availability while reducing total cost of ownership.

DPA UPScale's is a unique on-demand architecture that integrates the power rack, power distribution unit, back-up battery rack and monitoring and management solutions to allow easy selection of optimized configurations.

DPA UPScale's (Distributed Parallel Architecture) provides highest availability, unmatched flexibility and at the same time lowest cost of ownership in IT environments.

This Technical Specification provides detailed technical information on the mechanical, electrical and environmental performance of the DPA UPScale model types that can support to give answers to tender and end-user requirements. The DPA UPScale family was designed to respond to the most stringent safety, EMC and other important UPS standards. DPA UPScale family is offered in two types of solutions:

DPA UPScale ST is a rack-mounted modular design offering 5 types of Racks (Frames) types. This solution can accommodate 2 types of DPA UPScale Rack based Modules for a wide range of power requirements:

DPA UPScale ST (standard) frames:

- DPA UPScale ST 40 (40kW)
- DPA UPScale ST 60 (60kW)
- DPA UPScale ST 80 (80kW)
- DPA UPScale ST 120 (120kW)
- DPA UPScale ST 200 (200kW)

DPA UPScale Modules types:

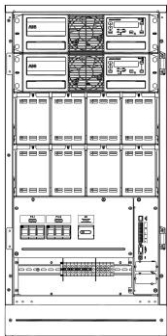
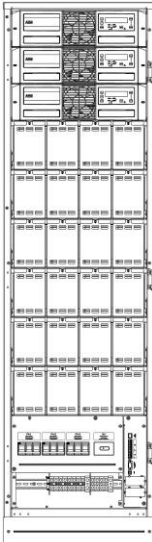
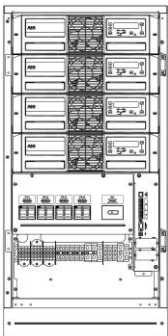
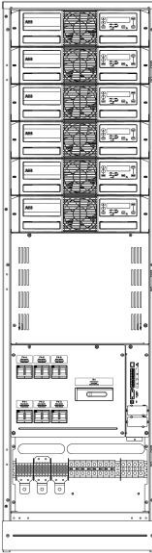
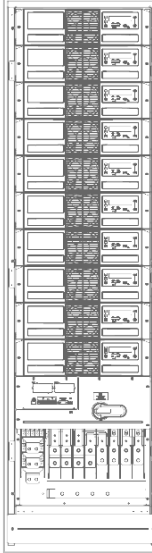
- UPScale M 10 (10kW)
- UPScale M 20 (20kW)

Key Features of DPA UPScale ST:

- | | |
|---|---|
| • Highest Availability
Modular, Decentralized Parallel Architecture (DPA) | <i>Near-zero down time</i> |
| • High Power Density (up to 472 kW / m ²),
Small Footprint | <i>Space-saving of expensive floor space</i> |
| • Unity Output Power Factor
Full power for loads with unity PF | <i>No de-rating for loads with Unity PF</i> |
| • Highest Efficiency even with partial loads
Efficiency = 94.5 - 95.5% for loads 25-100%
(depending on Module power and type of load) | <i>Energy cost saving during UPS-life-cycle</i> |
| • Very low input current distortion THDi
THDi =<3.0% @ 100 % load | <i>Gen-set power and installation cost saving</i> |

10.2 TECHNICAL CHARACTERISTICS

10.2.1 MECHANICAL CHARACTERISTICS FRAMES AND MODULES

DPA UPScale	unit	ST 40	ST 60	ST 80	ST 120	ST 200
DPA UPScale ST FRAMES						
Configuration Accommodates Maximal		2 modules (10 or 20kW) and 80 x 7/9Ah batteries	3 modules (10 or 20kW) and 240 x 7/9Ah batteries	4 modules (10 or 20kW) and NO batteries	6 modules (10 or 20kW) and NO batteries	10 modules (10 or 20kW) and NO batteries
Max. Power connection	kW	40	60	80	120	200
Dimensions (WxHxD)	mm	550x1135x770	550x1975x770	550x1135x770	550x1975x770	
Weight empty frame w/o modules w/o batteries	kg	92	173	82	133	174
Weight of Frame with modules and w/o batteries	kg	130 - 136	229 - 238	157 - 169	245 - 263	360 - 389
Audible noise at 1m from front, 100% / 50% Load, 20kW modules	dBA	66 / 60 ¹⁾ 1) approx.	66 / 60 ¹⁾	68 / 62 ¹⁾	68 / 62 ¹⁾	70 / 64 ¹⁾
Color		Graphite grey (Pulverlacke No. 4222903402 serie 09RCCAT1)				

Module type	unit	UPSscale M 10	UPSscale M 20
Module rated power	kW	10	20
Allowed nr. VRLA 12V battery blocks	No.	20 ²⁾ - 50	30 ²⁾ - 50
Dimensions (WxHxD)	mm	488x132x540 (3 HU)	
Weight	kg	18.6	21.5
Colors		RAL 7016 (front)	

²⁾ Depending of the effective load in kW used by the module (see chapter 10.4 Battery Characteristics)

10.3 INPUT CHARACTERISTICS

Module type	unit	UPScale M 10	UPScale M 20
Module rated power	kW	10	20
Nominal Input Voltage	V	3x380/220V+N, 3x400V/230V+N, 3x415/240V+N	
Input Voltage Tolerance (ref to 3x400/230V) for Loads in %:	V	(-20%/+15%) 3x308/184 V to 3x460/264 V for <100 % load (-26%/+15%) 3x280/170 V to 3x460/264 V for < 80 % load (-35%/+15%) 3x240/150 V to 3x460/264 V for < 60 % load	
Input Frequency	Hz	35 – 70	
Input Power Factor	-	0.99 @ 100 % load	
Inrush Current	A	max. In	
Total harmonic distortion (THDi)	%	< 4.5	< 3.0
Max. input power with rated output power (cosphi = 1.0), rated input voltage and charged battery per Module	kW	10.5	21
Max. Input Current with rated output power (cosphi = 1.0), rated input voltage and charged battery per Module	A	15.2	30.4
Max. Input Power with rated output power (cosphi = 1.0), rated input voltage and discharged battery per Module	kW	11.5	23
Max. Input Current with rated output power (cosphi = 1.0), rated input voltage and discharged battery per Module	A	16.6	33.3

10.4 BATTERY CHARACTERISTICS

Module type	unit	UPScale M 10	UPScale M 20
Battery Type	-	Maintenance free VRLA or NiCd	
Allowed nr. VRLA 12V battery blocks	-	30 ²⁾ - 50	40 ²⁾ - 50
Allowed nr. of 1.2V NiCd cells	-	300 ²⁾ - 500	400 ²⁾ - 500
Maximum charging current per module	A	4 (6 on request)	
Battery Charging Curve	-	Ripple free ; IU (DIN 41773)	
Temperature compensation	-	Standard (temp. sensor optional)	
Battery Test	-	Automatic and periodically (adjustable)	

Model	ST 40	ST 60	ST 80	ST 120	ST 200
Battery configuration	Common battery or separate battery for each module				Common battery or separate battery for two modules coupled.

²⁾ Depending of the effective autonomy (see table here below)

Module type	M10	M20
5 min autonomy: min. number of 12V batt. blocks	30	40
any autonomy: min. number of 12V batt. blocks	34	48

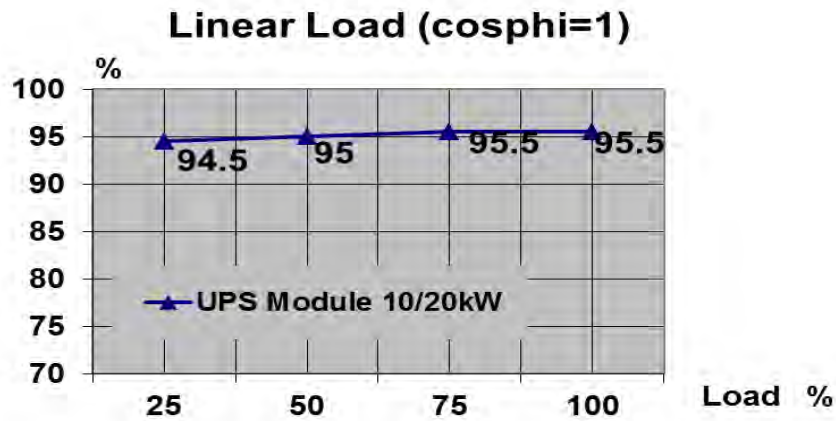
10.5 OUTPUT CHARACTERISTICS

Module type	unit	UPScale M 10	UPScale M 20
Output rated apparent power (cosphi 0.8)	kVA	10	20
Output rated active power (cosphi 1.0)	KW	10	20
Output nominal current (In) at 230VAC ph-N and cosphi 1.0	A	14.5	29
Output Rated Voltage	V	3x380/220V or 3x400/230V or 3x415/240V	
Output Voltage Stability	%	Static: Dynamic (Step load 0%-100% or 100%-0%)	< +/- 1% < +/- 4%
Output Voltage Distortion	%	With Linear Load With Non-linear Load (EN62040-3:2001)	< 1.5% < 3%
Output Frequency	Hz	50 Hz or 60 Hz	
Output Frequency Tolerance	%	Synchronized with mains (selectable for bypass operation) Free running	< +/- 2% or < +/- 4% +/- 0.1 %
Efficiency AC-AC (at cosphi 1.0) (tolerance +/- 0.5% applies on all figures)	%	Load : 100% 75% 50% 25% M20&M10: 95.5 95.5 95 94.5	
Bypass operation		At Nominal Input voltage of 3x400 V or 190 V to 264 V ph-N	
Permissible Unbalanced Load (All 3 phases regulated independently)	%	100%	
Phase Angle Tolerance (With 100 % Unbalanced load)	°	< 2	
Overload Capability on Inverter	%	125 % load 150 % load	10 min. 60 sec.
Output short capability on inverter (RMS)	A	3.0xIn during 40 ms	2.25xIn during 40 ms
Output short capability on static bypass (RMS)	A	10xIn during 20 ms	
Static bypass transfer time: inverter → bypass / bypass → inverter / in eco-mode	ms	<1 / <5 / <6	
Crest Factor (Load supported)		3:1	

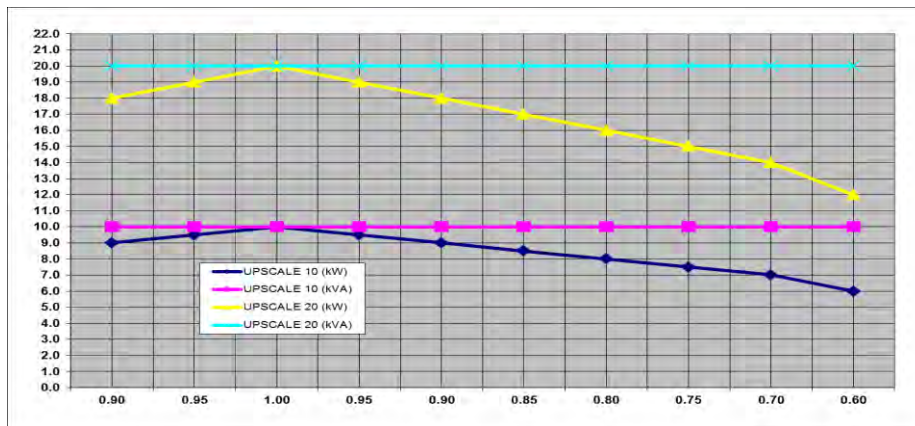
10.5.1 GRAPH: AC – AC EFFICIENCY with Linear load @ cosphi 1

Tolerance +/- 0.5% applies on all figures.

Efficiency up to 1 % higher with output PF cosphi 0.8 Details refer to paragraph 10.7 Environmental Characteristics



10.5.2 GRAPH: Output Power in kW and kVA VERSUS cosphi



		UPScale Module M-10		UPScale Module M-20	
cosφ		kW	kVA	kW	kVA
unity	0.9	9	10	18	20
	0.95	9.5	10	19	20
	1	10	10	20	20
Ind.	0.95	10	10	19	20
	0.9	9	10	18	20
	0.85	8.5	10	17	20
	0.8	8	10	16	20
	0.75	7.5	10	15	20
	0.7	7	10	14	20
	0.6	6	10	12	20

10.6 ENVIRONMENTAL CHARACTERISTICS

Module type	unit	UPScale M 10	UPScale M 20
Module rated power	kW	10	20
Operation temperature	°C	0 - 40	
Ambient Temperature for Batteries (recommended)	°C	20 - 25	
Storage Temperature	°C	-25 - +70	
Battery Storage Time at Ambient Temperature		Max. 6 months	
Max. altitude (above sea level) without de-rating	m/feet	1000 / 3300ft	
De-rating factor for use at altitudes above 1000m sea level according (IEC 62040-3)	m/feet	(meter / feet) above sea level	De-Rating Factor for Power
		1500 / 4850	0.95
		2000 / 6600	0.91
		2500 / 8250	0.86
		3000 / 9900	0.82
Relative Air-humidity		Max. 95% (non-condensing)	
UPS Positioning		See chapter 10.11	
Input and Output Power Cabling		From the bottom on the front	
Efficiency AC-AC up to (at cosphi 1.0) (tolerance +/- 0.5% applies on all figures)	%	<i>Load</i> : 100 % 75 % 50% 25% M20&M10: 95.5% 95.5% 95% 94.5%	
Efficiency with Linear Load at cosphi =0.8 ind		Typically up to 1 % higher of above values	
Efficiency Non-linear Load (IEC/EN 6240-3)		Typically up to 1 % lower of above values	
Eco-Mode efficiency at 100% load	%	98 %	

10.7 STANDARDS

Safety	EN 62040-1-1, EN 60950-1
Electromagnetic Compatibility	EN 61000-6-4 Prod.standard: EN 62040-2 EN 61000-6-2 Prod.standard: EN 62040-2 EN 61000-4-2, EN 61000-4-3 - EN 61000-4-4 - EN 61000-4-5 - EN 61000-4-6
EMC Classification, Emission Class	C3
Immunity Class	C3
Performance	IEC/EN 62040-3
Product certification	CE
Degree of protection	IP 20

10.8 COMMUNICATION

Power Management Display (PMD)	1 LCD display for each module
RJ45 Plug (Not used)	RJ45 Plug (for future options)
Customer Interfaces : Outputs DRY PORT X 2	5 voltage free contacts For remote signaling and automatic computer shutdown
Customer Interfaces : Inputs DRY PORT X1	1 x Remote Shut down [EMERGENCY OFF (Normally closed)] 2 x Programmable Customer's Inputs (1 st default as GEN-ON (Normally open)) (2 nd free Programmable Customer's Inputs (Normally open)) 1 x Temp. Sensor for Battery Control 1 x 12 Vdc output (max. 200mA)
Serial ports RS232 on Sub-D9	1 x system frame For monitoring and integration in network management
USB	1x For monitoring and software management
Slot for SNMP	SNMP card (optional) For monitoring and integration in network management

10.8.1 POWER MANAGEMENT DISPLAY (PMD)

The user-friendly PMD consists of three parts the MIMIC DIAGRAM, CONTROL KEYS and LCD that provides the necessary monitoring information about the UPS.

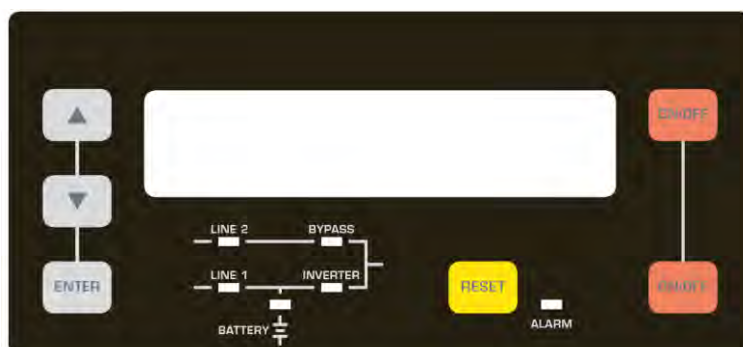
10.8.2 MIMIC DIAGRAM

The mimic diagram serves to give the general status of the UPS. The LED-indicators show the power flow status and in the event of mains failure or load transfer from inverter to bypass and vice-versa the corresponding LED-indicators will change color from green (normal) to red (warning). The LED's LINE 1 (rectifier) and LINE 2 (bypass) indicate the availability of the mains power supply. The LED's INVERTER and BYPASS if green indicate which of the two are supplying power to the critical load. When the LED-indicator BATTERY is lit it means that the battery due to mains failure is supplying the load. The LED-indicator ALARM is a visual indication of any internal or external alarm condition. At the same time the audible alarm will be activated.

10.8.3 DISPLAY

The 2 x 20 character LCD simplifies the communication with the UPS. The menu driven LCD enables the access to the EVENT REGISTER, or to monitor the input and output U, I, f, P, Autonomy Time and other Measurement's, to perform commands like start-up and shut-down of INVERTER or load transfer from INVERTER to BYPASS and vice-versa and finally it serves for the DIAGNOSIS (SERVICE MODE) for adjustments and testing (for more details see the USER MANUAL of DPA UPScale™).

10.8.4



Power Management Display (PMD)
of DPA UPScale™

10.8.4 CUSTOMER INTERFACES Terminals X1...X2**10.8.5 CUSTOMER INPUTS DRY PORT s: Terminal block X2**

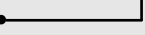
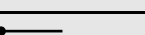
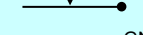
Connection of Remote Shut down facilities, Generator Operation, Customers specials
(see UM Section 9 / OPTIONS)

10.8.6 CUSTOMER OUTPUTS DRY PORTs : Terminal blocks X1

Provision of signals for the automatic and orderly shutdown of servers, AS400 or Automation building systems

All voltage free contacts are rated 60 VAC max. and 500 mA max.:

All the interfaces are connected to Phoenix Spring terminals with wires : 0.5 mm²

Block	Terminal	Contact	Signal	On Display	Function
X2	X2 / 1	NO 	ALARM	MAINS_OK	Mains Present
	X2 / 2	NC 			Mains Failure
	X2 / 3	C 			Common
	X2 / 4	NO 	Message	LOAD_ON_INV	Load on Inverter
	X2 / 5	NC 			(Load on Mains bypass)
	X2 / 6	C 			Common
	X2 / 7	NO 	ALARM	BATT_LOW	Battery Low
	X2 / 8	NC 			Battery OK
	X2 / 9	C 			Common
	X2 / 10	NO 	Message	LOAD_ON_MAINS	Load on bypass (Mains)
	X2 / 11	NC 			(Load on Inverter)
	X2 / 12	C 			Common
	X2 / 13	NO 	ALARM	COMMON_ALARM	Common Alarm (System)
	X2 / 14	NC 			NO Alarm Condition
	X2 / 15	C 			Common
X1	X1 / 1	 IN	+ 12Vdc		Generator Operation
	X1 / 2	GND	GND		(NC = Generator ON)
	X1 / 3	 IN	+ 12Vdc		Customer IN 1
	X1 / 4	GND	GND		(Function on request, to be defined)
	X1 / 5	 IN	+ 3.3Vdc		Temperature Battery
	X1 / 6	GND	GND		(If connected , the battery charger current if depending of the battery temp.)
	X1 / 7	 IN	+ 12Vdc		Remote Shut down
	X1 / 8	GND	GND		(Do not remove the factory mounted bridge until external Remote Shut down is connected)
	X1 / 9	 IN	+ 12Vdc		12 Vdc source
	X1 / 10	GND	GND		(max. 200 mA load)

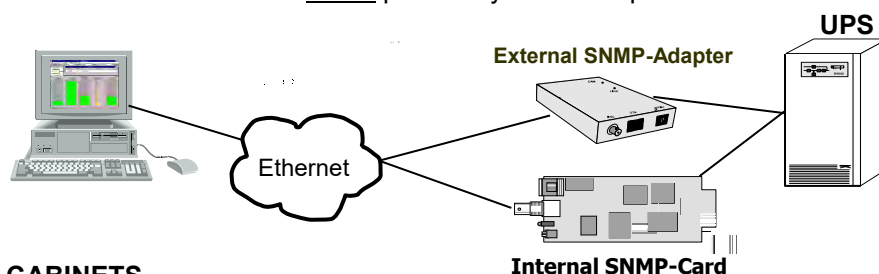
Phoenix Spring Terminals (X1...X2) Connection

10.9 OPTIONS

- SNMP card + WaveMon Management Software
- External Battery Cabinets
- Backfeed protection
- Temp. sensor for battery temp. control

10.9.1 SNMP card / WaveMon Management Software

The Simple Network Management Protocol (SNMP) is a worldwide-standardized communication-protocol. It is used to monitor any device in the network via simple control language. The UPS-Management Software WaveMon also provides its data in this SNMP format with its internal software agent. The operating system you are using must support the SNMP protocol. We offer our WaveMon software with SNMP functionality for Novell, OS/2, all Windows running on INTEL and ALPHA, DEC VMS, Apple. Two types of SNMP interfaces with identical functionality are available: an external SNMP-Adapter (Box) and an internal SNMP-Card. Both can manage a parallel system (N modules) and return either global values - which are consistent for the whole parallel system - or specific values from the single modules.



10.9.2 BATTERY CABINETS

S-type = For Separate. Battery C-type = For Common. Battery	unit	CBAT-UPScale-120 S-type or C-type	CBAT-UPScale-200 S-type or C-type
BATTERY FRAMES			
Configuration accommodates:	Max.	120 Batt. block x 24Ah/28Ah on 8 shelf 3x5=15 blocks/shelf	200 Batt. blocks x 24Ah/28Ah on 7 shelf 6x5=30 blocks/shelf
Battery fuses / Max. Batt. Strings : Terminals :	S-type	9 / 3 (Terminal 9 x 16/25mm ²)	15 / 5 (Terminal 15 x 16/25mm ²)
Battery fuses / Max. Batt. Strings Terminals :	C-type	9 / 3 + Com. Connection Bar 3 x (2xM8) +PE 2xM8	15 / 5 + Com. Connection Bar 3 x (2xM10) +PE 2xM10
Fuse Type (Very Fast acting)	A	3x100 A	5x100A
Dimensions (WxHxD)	mm	730x1975x800	1200x1975x800
Weight with trays and w/o batteries	kg	290	410
Possible Battery configurations within the Battery Cabinets		Battery Configurations (1x40)x28Ah / (2x40)x28Ah / (3x40)x28Ah / (2x50)x28Ah	Battery Configurations (1x40)x28Ah / (2x40)x28Ah / (3x40)x28Ah / (4x40)x28Ah / (5x40)x28Ah / (2x50)x28Ah) / (4x50)x28Ah

10.10 BATTERY AUTONOMIES

10.10.1 Examples of Internal Battery Autonomy of DPA UPScale ST40 and ST 60

Module Type		UPScale M 10		UPScale M 20 Module need at least 48 blocks for full power or minimum 40 blocks for 16kW		
Internal Separate Battery configuration		Battery Autonomy in (min.) per Module				
Frame Type	Separate Battery / Module	8kW	10kW	12kW	16kW	20KW
UPScale ST 40 max. 80 blocks up to 2 modules	(1x40)x7Ah / Module	8	6	5		
UPScale ST 40 max. 80 blocks 1 modules ONLY	(1x50)x7Ah / Module	11	8.	7	4	
UPScale ST 60 max. 240 blocks up to 3 modules	(1x40)x7Ah / Module	8	6	5		
UPScale ST 60 max. 240 blocks up to 3 modules	(2x40)x7Ah / Module	21	15	12	8	5

Internal Common Battery configuration		Battery Autonomy in (min.) for Tot. System Power				
With 1 Module	Module Type	1 x UPScale M 10		1 x UPScale M 20		
	Total System Power	8kW	10kW	12kW	16kW	20kW
UPScale ST 40 or UPScale ST 60	1x (2x40)x7Ah	21	15	12	8	5
UPScale ST 60	2x (1x50)x7Ah	28	21	16	11	8
UPScale ST 60	3x (1x40)x7Ah	35	26	21	14	5
UPScale ST 60	3x (1x50)x7Ah	47	35	28	19	14
UPScale ST 60	4x (1x50)x7 Ah	69	52	41	28	21
UPScale ST 60	3x (2x40)x7Ah	88	66	52	35	5
With 2 Modules	Module Type	2 x UPScale M 10		2 x UPScale M 20		
	Total System Power	16kW	20kW	24kW	32KW	40kW
UPScale ST 40 or UPScale ST 60	1x (2x40)x7Ah	8	6	5		
UPScale ST 60	2x (1x50)x7Ah	11	8	7	4	
UPScale ST 60	3x (1x40)x7Ah	14	11	8	6	5
UPScale ST 60	3x (1x50)x7Ah	19	14	11	8	6
UPScale ST 60	4x (1x50)x7 Ah	28	21	16	11	8
UPScale ST 60	3x (2x40)x7Ah	35	26	21	14	5
With 3 Modules	Module Type	3 x UPScale M 10		3 x UPScale M 20		
	Total System Power	24kW	30KW	36kW	48KW	60kW
UPScale ST 60	2x (1x50)x7Ah	7	5	4		
UPScale ST 60	3x (1x40)x7Ah	8	6	5		
UPScale ST 60	2x (2x40)x7Ah	12	9	7	5	4
UPScale ST 60	4x (1x50)x7 Ah	16	12	10	7	5
UPScale ST 60	3x (2x40)x7Ah	21	15	12	8	5

10.10.2 Examples of External Battery Autonomy

This configuration are mostly used in combination with the frame UPScale ST 80 or ST 120 or ST 200.

Module Type		UPScale M 10		UPScale M 20	
External Separate Battery configuration ST 80 or ST 120		Battery Autonomy in (min.) per Module			
Battery Cabinet	Battery / Module	1x UPScale M 10		1 x UPScale M 20	
	Total System Power	8kW	10kW	16kW	20kW
1x CBAT--UPScale -120S	1x40x28Ah	54	41	22	not allowed
1x CBAT--UPScale -120S	1x50x28Ah	72	54	30	22
External Separate Battery configuration ST 200		Battery Autonomy in (min.) per Module			
Battery Cabinet	Battery / Module	2x UPScale M 10		2 x UPScale M 20	
	Total System Power	16kW	20kW	32kW	40kW
1x CBAT--UPScale -200S	(1x40)x28Ah	20	15	8	not allowed
1x CBAT--UPScale -200S	(1x50)x28Ah	27	20	9	6

External Common Battery configuration (with 40bl./string)		Battery Autonomy in (min.) for Tot. System Power (3+1)	
With 3 Modules	Module Type	3 x UPScale M 10	3 x UPScale M 20
	Total System Power	30 KW	48KW
1x CBAT-UPScale-120C	(2x40)x28Ah	24	13
1x CBAT-UPScale-120C	(3x40)x28Ah	41	22
1x CBAT-UPScale-200C	(4x40)x28Ah	59	32
1x CBAT-UPScale-200C	(5x40)x28Ah	78	43
External Common Battery configuration (with 50bl./string)		Battery Autonomy in (min.) for Tot. System Power (3+1)	
With 3 Modules	Total System Power	30 KW	60 KW
1x CBAT-UPScale-120C	(1x50)x28Ah	13	5
1x CBAT-UPScale-120C	(2x50)x28Ah	32	13
1x CBAT-UPScale-200C	(3x50)x28Ah	54	22
1x CBAT-UPScale-200C	(4x50)x28Ah	78	32

External Common Battery configuration (with 40bl./string)		Battery Autonomy in (min.) for Tot. System Power (5+1)	
With 5 Modules	Module Type	5 x UPScale M 10	5 x UPScale M 20
	Total System Power	50 KW	80KW
1x CBAT-UPScale-120C	(2x40)x28Ah	13	7
1x CBAT-UPScale-120C	(3x40)x28Ah	21	12
1x CBAT-UPScale-200C	(4x40)x28Ah	31	17
1x CBAT-UPScale-200C	(5x40)x28Ah	41	22
External Common Battery configuration (with 50bl./string)		Battery Autonomy in (min.) for Tot. System Power (5+1)	
With 5 Modules	Total System Power	50 KW	100 KW
1x CBAT-UPScale-120C	(1x50)x28Ah	7	
1x CBAT-UPScale-120C	(2x50)x28Ah	17	7
1x CBAT-UPScale-200C	(3x50)x28Ah	28	12
1x CBAT-UPScale-200C	(4x50)x28Ah	41	17

External Common Battery configuration (with 40bl./string)		Battery Autonomy in (min.) for Tot. System Power (7+1)	
With 7 Modules	Module Type	5 x UPScale M 10	5 x UPScale M 20
	Total System Power	60 KW	120KW
1x CBAT-UPScale-200C	(4x40)x28Ah	23	10
1x CBAT-UPScale-200C	(5x40)x28Ah	31	14
External Common Battery configuration (with 50bl./string)		Battery Autonomy in (min.) for Tot. System Power (7+1)	
With 7 Modules	Total System Power	60 KW	120 KW
1x CBAT-UPScale-200C	(3x50)x28Ah	23	10
1x CBAT-UPScale-200C	(4x50)x28Ah	31	14

External Common Battery configuration (with 40bl./string)		Battery Autonomy in (min.) for Tot. System Power (9+1)	
With 9 Modules	Module Type	5 x UPScale M 10	5 x UPScale M 20
	Total System Power	90 KW	180KW
1x CBAT-UPScale-200C	(4x40)x28Ah	13	5
1x CBAT-UPScale-200C	(5x40)x28Ah	17	7
External Common Battery configuration (with 50bl./string)		Battery Autonomy in (min.) for Tot. System Power (9+1)	
With 9 Modules	Total System Power	90 KW	180 KW
1x CBAT-UPScale-200C	(3x50)x28Ah	12	5
1x CBAT-UPScale-200C	(4x50)x28Ah	17	7

10.11 INSTALLATION PLANNING – UPS POSITIONING

Clearances needed to allow proper airflow on the UPS system and to allow door opening.

Minimum clearances for single UPS				
UPS Model	A ₁ (mm)	B ₁ (mm)	C (°)	D (mm)
ST 40, ST 60, ST 80, ST 120	200	1000	115°	400
ST 200	300			

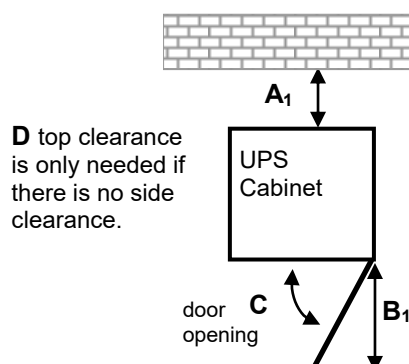


Figure 1: top view and indication of the minimum clearances for single UPS.

Minimum clearances for UPS + other cabinets in row				
UPS Model	A ₂ (mm)	B ₂ (mm)	C (°)	D (mm)
ST 40, ST 60, ST 80, ST 120	300	1000	115°	400
ST 200	300	1000		

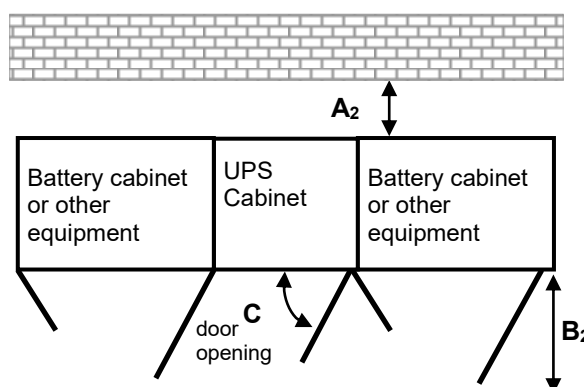


Figure 2: top view and indication of the minimum clearances for UPS + other cabinets in row .

The model ST 200 has fuses at the rear side of the cabinet. To guarantee access to those fuses and proper operating space up to 1000mm clearance may be needed when having UPS and other cabinets in row.

UPS Frame type (40kW up to 200 kW)	ST 40	ST 60	ST 80	ST 120	ST 200
Dimensions (WxHxD) mm	550x1135x770	550x1975x770	550x1135x770	550x1975x770	550x1975x770
External Battery Cabinet Type	CBAT UPScale-120C CBAT UPScale-120S			CBAT UPScale-200S	
			CBAT UPScale-200C		
Dimensions (WxHxD) mm	730x1975x800		1200x1975x800		
Accessibility	Totally front accessibility for service and maintenance				
Positioning	see chapter 10.11				
Input and Output Cabling	From the bottom on the front				

10.11.1 HEAT DISSIPATION PER MODULE WITH NON-LINEAR LOAD

Module Range		UPScale M 10 or M 20	
Module Type		UPScale M 10	UPScale M 20
Heat Dissipation with 100% Non-linear Load per Module (EN 62040-1-1)	W	550	1100
Heat Dissipation with 100% Non-linear Load per Module (EN 62040-1-1)	BTU/h	1887	3754
Airflow (25° - 30°C) with Non-linear Load per Module (EN 62040-1-1)	m³/h	150	150
Dissipation at no load	W	120	150

10.12 WIRING AND BLOCK DIAGRAMS FOR ALL FRAMES AND MODULES

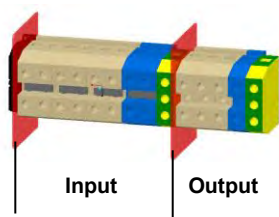
The customer has to supply the wiring to connect the UPS to the local power source. The installation inspection and initial start-up of the UPS and extra battery cabinet must be carried out by a qualified service personnel such as a licensed service engineer from the manufacturer or from an agent certified by the manufacturer. More details and procedure are mentioned in the user manual.

10.12.1 TERMINAL CONNECTIONS OVERVIEW

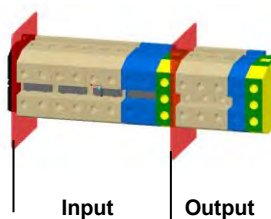
FRAME TYPE (T) Compression type Terminals (B) Bolted Terminals	Battery Earth PE	Separate. Battery (+ / N / -)	Common Battery (+ / N / -)	Input Bypass 3+N	Input Rectifier 3+N+PE	Output load 3+N+PE
UPScale ST 40	n.a	n.a	n.a	4 x 16/25 mm ² (T)	5 x 16/25 mm ² (T)	5 x 16/25 mm ² (T)
UPScale ST 60	n.a	n.a	n.a	4 x 35 mm ² (T)	4 x 35 mm ² (T) +PE 50 mm ² (T)	4 x 35 mm ² (T) +PE 50 mm ² (T)
UPScale ST 80	50 mm ² (T)	4x (3 x 10/16mm ²) (T)	3 x M6 (B)	3 x 50 mm ² (T) + N 70/95 mm ² (T)	3 x 50 mm ² (T) + N 70/95 mm ² (T) +PE 50 mm ² (T)	3 x 50 mm ² (T) + N 70/95 mm ² (T) +PE 50 mm ² (T)
UPScale ST 120	50 mm ² (T)	6x (3 x 10/16mm ²) (T)	3 x 2xM5 (B) or 3 x M10 (B)	4 x 70/95mm ² (T)	4 x 70/95mm ² (T) +PE 50 mm ² (T)	4 x 70/95mm ² (T) +PE 50 mm ² (T)
UPScale ST 200	1xM10 (B)	5x (3 x 35mm ²) (T) 2 modules have common Battery	2 x (3 x M10) (B)	3 x M12 (B) +PE 1 x M12	4 x M12 (B) +PE 1 x M12	4 x M12 (B) +PE 1 x M12

n.a = not allowed

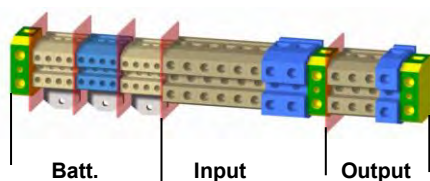
UPScale ST 40



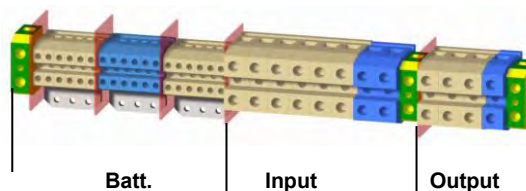
UPScale ST 60



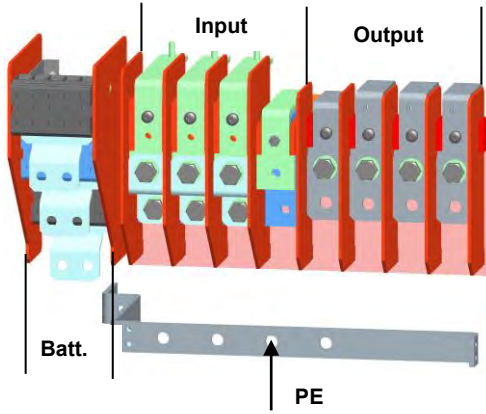
UPScale ST 80



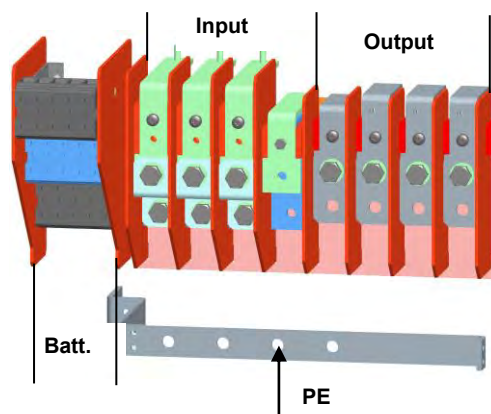
UPScale ST 120



UPScale ST 200



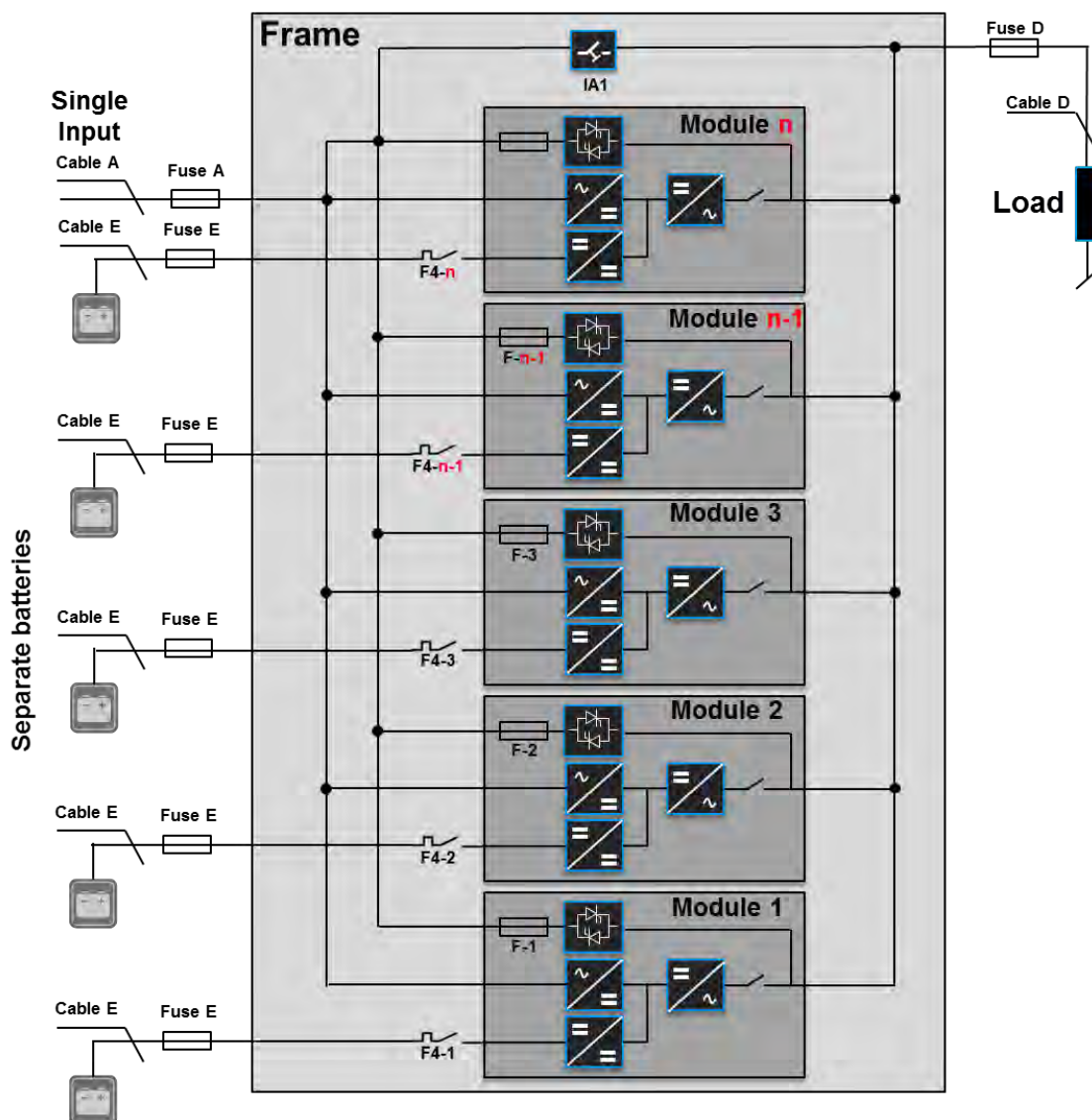
Common Battery



Separate battery (for two modules coupled)

10.12.2 SINGLE FEED INPUT

Cable Sections and Fuse Ratings recommended. Alternatively, local standards to be respected



10.12.3 SINGLE FEED INPUT / Cable Sections

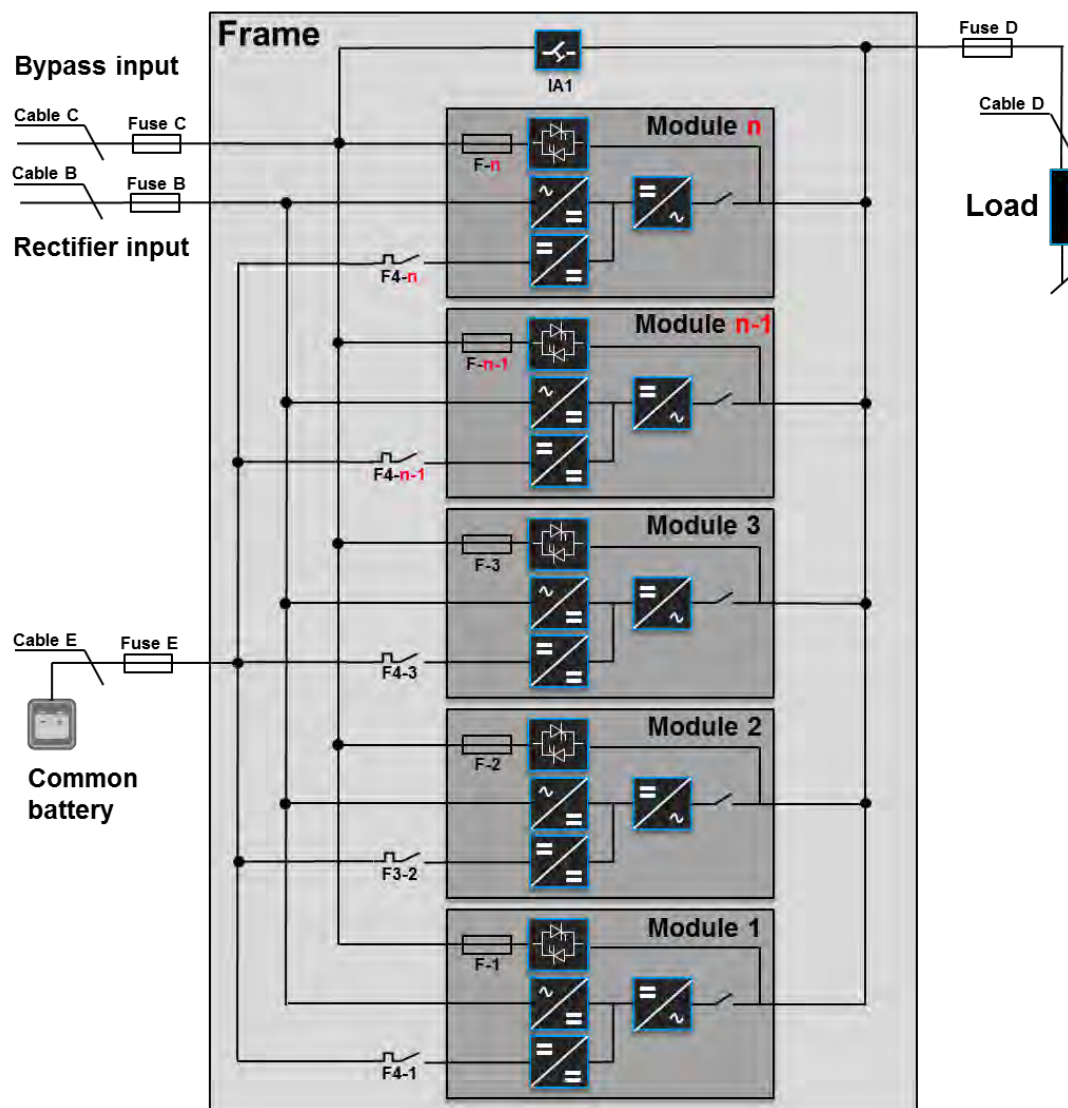
Frame type	Load in kW	Input 3x400V/230V			Output 3x400V/230V @ cosphi 1.0		Battery		
		Fuse A (Agl/CB)	Cable A (mm ²) (IEC 60950-1)	Max. Input Current with battery charging [A]	Cable D (mm ²) (IEC 60950-1)	I _{nom} [A]	Fuse E + / N / - (Agl/CB)	Cable E (mm ²) for CBAT UPScale 120 or 200 ONLY + / N / -	
								Com. Battery	Sep. Battery
UPSscale ST 40	40	3x80A	5x16	68 A	5x16	58 A	n.a	n.a	n.a
UPSscale ST 60	60	3x125A	5x35	102 A	5x35	87 A	n.a	n.a	n.a
UPSscale ST 80	80	3x160A	5x50	136 A	5x50	116 A	3x224A*1	3x95 *1	4x (3x10)
UPSscale ST 120	120	3x224A	4x95+1x50 (PE)	208 A	5x70	174 A	3x300A*1	3x150 *1	6x (3x10)
UPSscale ST 200	200	3 x 350 A	5 x 185	333 A	5 x 185	290 A	3 x 450 *1	3 x (2 x 95)*1	5 x (3x25)

*1 only valid for common battery use

n.a = not allowed

10.12.4 DUAL FEED INPUT

Cable Sections and Fuse Ratings recommended. Alternatively, local standards to be respected



10.12.5 Dual FEED INPUT / Cable Sections

Frame type	Load in kW	Input 3x400V/230V			Bypass 3x400V/230V		Output 3x400V/230V @ cosphi 1.0		Battery		
		Fuse B (Agl/CB)	Cable B (mm ²) (IEC 60950-1)	Max. Input Current with battery charging [A]	Fuse C (Agl/CB)	Cable C (mm ²) (IEC 60950-1)	Cable D (mm ²) (IEC 60950-1)	I nom [A]	Fuse E +/N/- (Agl/CB)	Cable E (mm ²) for CBAT UPScale 120 or 200 ONLY + / N / -	
										Com. Battery	Sep. Battery
UPScale ST 40	40	3x80A	5x16	68 A	3x80A	4x16	5x16	58 A	n.a	n.a	n.a
UPScale ST 60	60	3x125A	5x35	102 A	3x125A	4x35	5x35	87 A	n.a	n.a	n.a
UPScale ST 80	80	3x160A	5x50	136 A	3x160A	4x50	5x50	116 A	3x224A*1	3x95 *1	4x (3x10)
UPScale ST 120	120	3x224A	4x95+1x50 (PE)	208 A	3x224A	4x95	5x70	174 A	3x300A*1	3x150 *1	6x (3x10)
UPScale ST 200	200	3 x 350 A	5 x 185	333 A	3 x 350 A	4 x 185	5 x 185	290 A	3 x 450 *1	3 x (2 x 95)*1	5 x (3x25)

n.a = not allowed

*1 only valid for common battery use