Galaxy VL

For IEC

Technical Specifications

3/2021



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Go to *https://www.productinfo.schneider-electric.com/galaxyvl_iec/*
or scan the QR code above for digital experience and translated manuals.

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Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Electromagnetic Compatibility

NOTICE

RISK OF ELECTROMAGNETIC DISTURBANCE

This is a product category C2 UPS product. In a residential environment, this product may cause radio inference, in which case the user may be required to take additional measures.

Failure to follow these instructions can result in equipment damage.

Safety Precautions

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The product must be installed according to the specifications and requirements as defined by Schneider Electric. It concerns in particular the external and internal protections (upstream circuit breakers, battery circuit breakers, cabling, etc.) and environmental requirements. No responsibility is assumed by Schneider Electric if these requirements are not respected.
- After the UPS system has been electrically wired, do not start up the system. Start-up must only be performed by Schneider Electric.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS System must be installed according to local and national regulations. Install the UPS according to:

- IEC 60364 (including 60364–4–41- protection against electric shock, 60364–4–42 - protection against thermal effect, and 60364–4–43 - protection against overcurrent), **or**
- NEC NFPA 70

depending on which one of the standards apply in your local area.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Install the UPS system in a temperature controlled area free of conductive contaminants and humidity.
- Install the UPS system on a non-inflammable, level, and solid surface (e.g. concrete) that can support the weight of the system.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS is not designed for and must therefore not be installed in the following unusual operating environments:

- Damaging fumes
- Explosive mixtures of dust or gases, corrosive gases, or conductive or radiant heat from other sources
- Moisture, abrasive dust, steam or in an excessively damp environment
- Fungus, insects, vermin
- Salt-laden air or contaminated cooling refrigerant
- Pollution degree higher than 2 according to IEC 60664-1
- Exposure to abnormal vibrations, shocks, and tilting
- Exposure to direct sunlight, heat sources, or strong electromagnetic fields

Failure to follow these instructions will result in death or serious injury.

NOTICE

RISK OF OVERHEATING

Respect the clearance requirements around the UPS system and do not cover the product's ventilation openings when the UPS system is in operation.

Failure to follow these instructions can result in equipment damage.

NOTICE

RISK OF EQUIPMENT DAMAGE

Do not connect the UPS output to regenerative load systems including photovoltaic systems and speed drives.

Failure to follow these instructions can result in equipment damage.

Model List

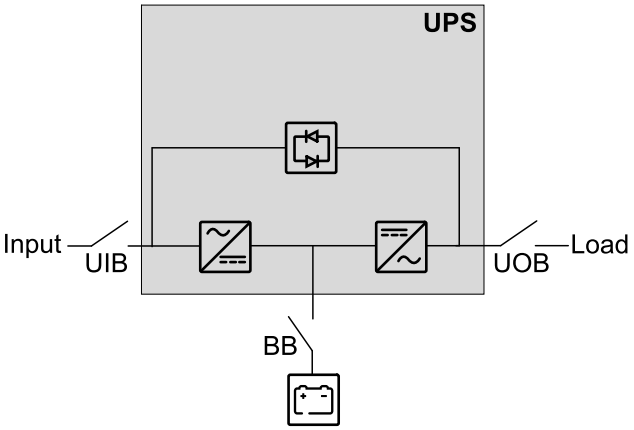


- Galaxy VL UPS 200 kW scalable to 500 kW, 400/480V, start-up 5x8 (GVL200K500DS)
- Galaxy VL UPS 300 kW scalable to 500 kW, 400/480V, start-up 5x8 (GVL300K500DS)
- Galaxy VL UPS 400 kW scalable to 500 kW, 400/480V, start-up 5x8 (GVL400K500DS)
- Galaxy VL UPS 500 kW, 400/480V, start-up 5x8 (GVL500KDS)

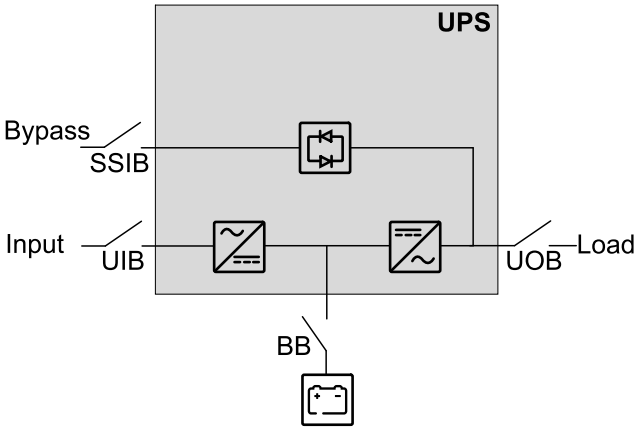
Single System Overview

UIB	Unit input breaker
SSIB	Static switch input breaker
UOB	Unit output breaker
BB	Battery breaker

Single System – Single Mains



Single System – Dual Mains

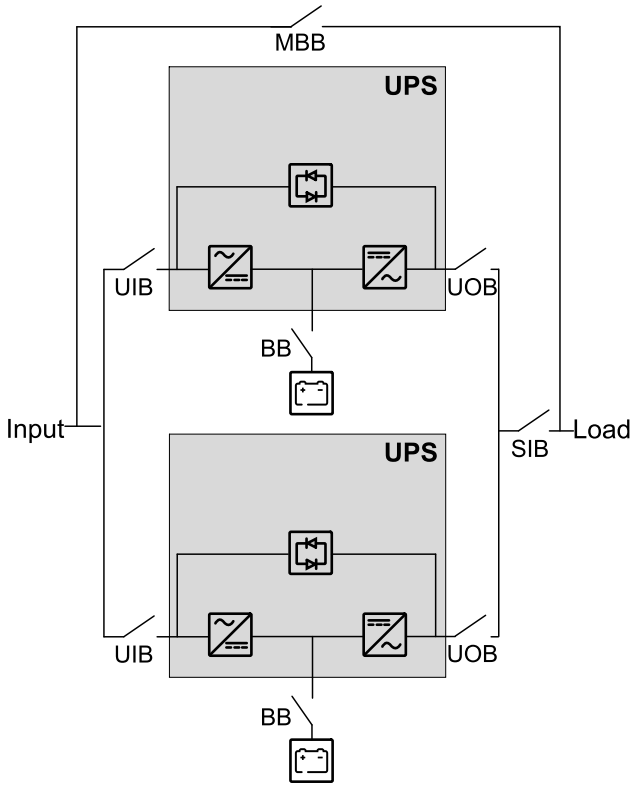


Parallel System Overview

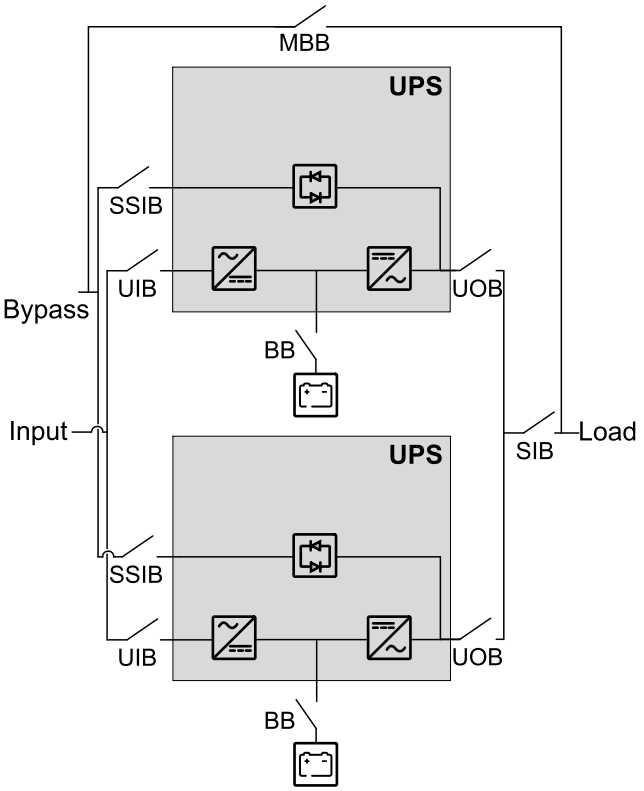
UIB	Unit input breaker
SSIB	Static switch input breaker
UOB	Unit output breaker
SIB	System isolation breaker
BB	Battery breaker
MBB	External maintenance bypass breaker

Galaxy VL can support up to 4 UPSs in parallel for capacity and up to 3+1 UPSs in parallel for redundancy with individual unit input breaker UIB and static switch input breaker SSIB.

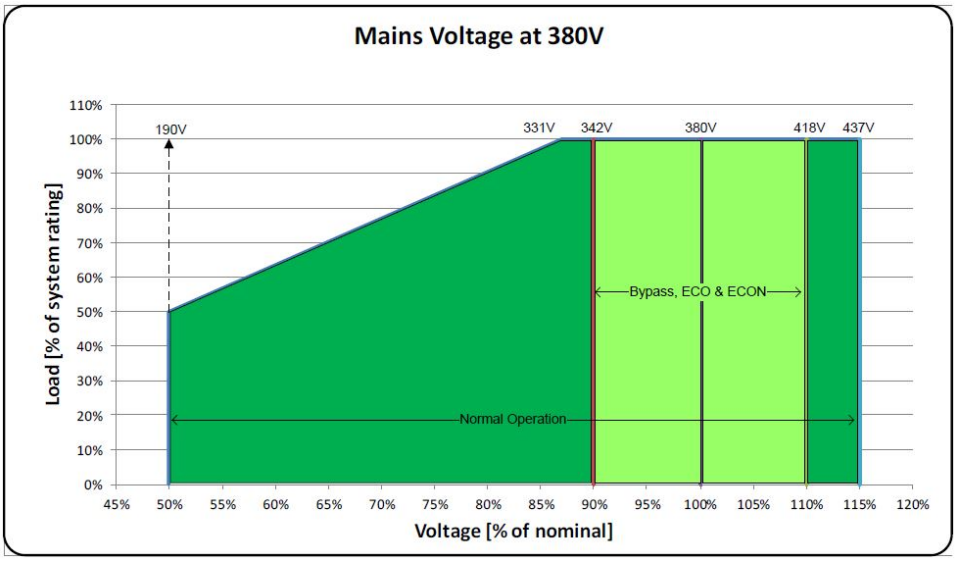
Parallel System – Single Mains

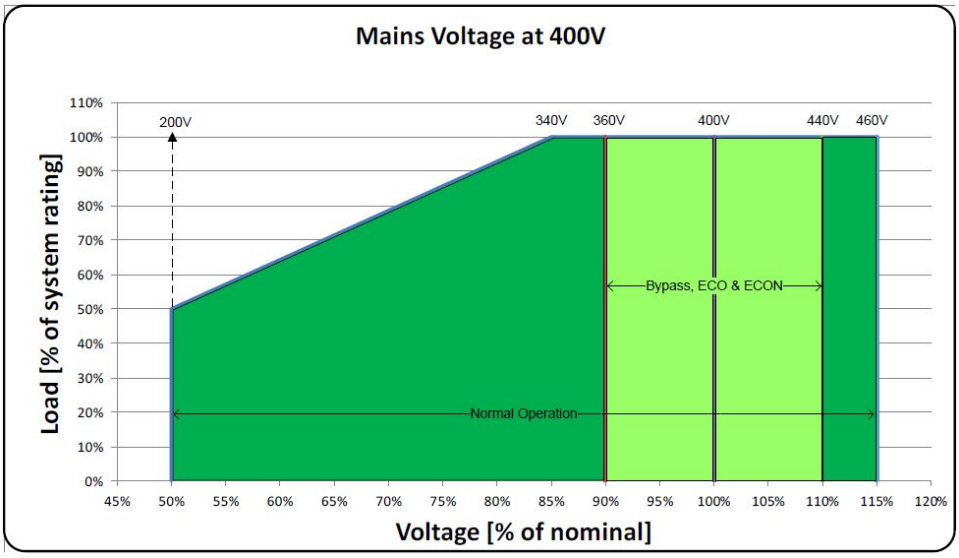


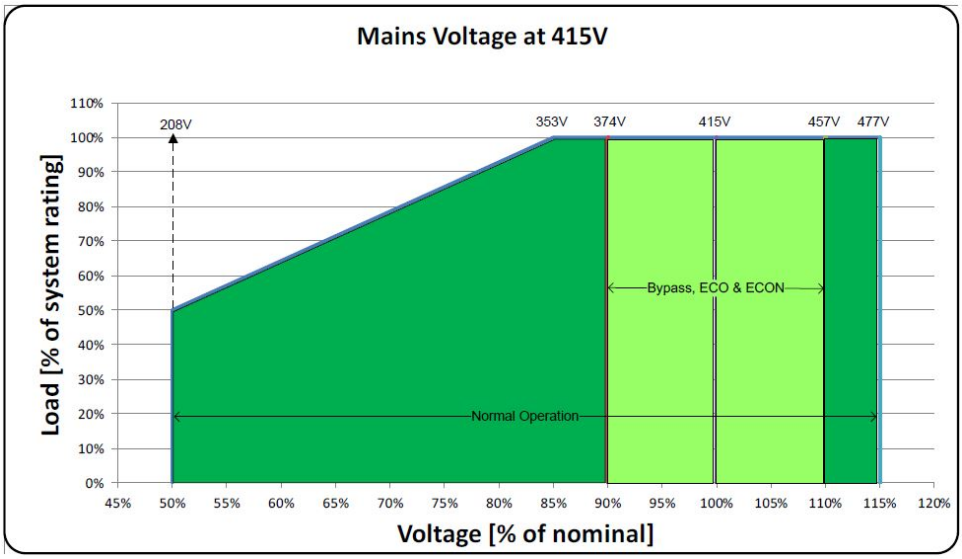
Parallel System – Dual Mains



Input Voltage Window







Inverter Short Circuit Capabilities (Bypass not Available)

IK1 – Short Circuit between a Phase and Neutral

S [kVA]	Ik10ms [A] / I²t [A²s]	Ik20ms [A] / I²t [A²s]	Ik30ms [A] / I²t [A²s]	Ik100ms [A] / I²t [A²s]	0.5-5s; I[A]
200	660 /4500	660 /8800	650 /13200	550 /38900	430 /
250	830 /7000	820 /13800	820 /20600	690 /60700	530 /
300	990 /10100	990 /19900	980 /29600	820 /87400	640 /
350	1160 /13700	1150 /27100	1150 /40300	960 /119000	750 /
400	1320 /17900	1320 /35400	1310 /52700	1100 /155400	850 /
450	1490 /22600	1480 /44800	1470 /66700	1230 /196700	960 /
500	1650 /28000	1650 /55300	1640 /82300	1370 /242800	1070 /

IK2 – Short Circuit between Two Phases

S [kVA]	Ik10ms [A] / I²t [A²s]	Ik20ms [A] / I²t [A²s]	Ik30ms [A] / I²t [A²s]	Ik100ms [A] / I²t [A²s]	0.5-5s; I[A]
200	610 /3800	610 /7500	600 /11100	510 /33000	400 /
250	760 /5900	760 /11700	750 /17400	640 /51600	500 /
300	910 /8500	910 /16800	900 /25000	770 /74300	600 /
350	1070 /11600	1060 /22900	1050 /34100	890 /101100	700 /
400	1220 /15100	1210 /29900	1200 /44500	1020 /132000	800 /
450	1370 /19200	1360 /37800	1350 /56300	1150 /167100	900 /
500	1520 /23600	1520 /46700	1500 /69500	1280 /206300	1000 /

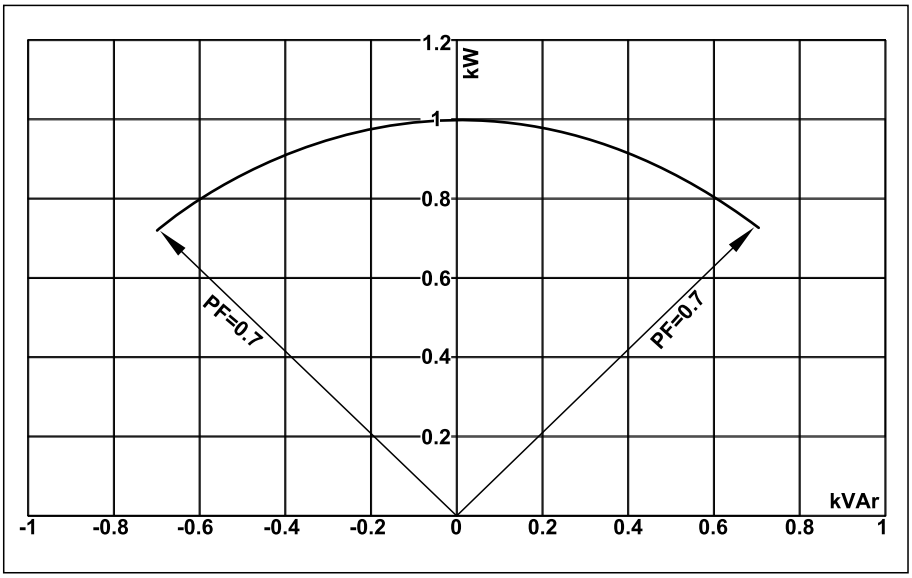
Efficiency

NOTE: These values are preliminary and may be subject to change pending tests.

500 kW	**Normal operation**		
Voltage (V)	**380**	**400**	**415**
25% load	96.6	96.6	96.5
50% load	97.0	97.1	97.1
75% load	96.8	97.0	97.1
100% load	96.5	96.7	96.8

Derating Due to Load Power Factor

0.7 leading to 0.7 lagging without derating.



UPS rating	UPS output					
	Lagging			Leading		
PF=1	PF=0.7	PF=0.8	PF=0.9	PF=0.9	PF=0.8	PF=0.7
200 kW/kVA	200 kVA / 140 kW	200 kVA / 160 kW	200 kVA / 180 kW	200 kVA / 180 kW	200 kVA / 160 kW	200 kVA / 140 kW
250 kW/kVA	250 kVA / 175 kW	250 kVA / 200 kW	250 kVA / 225 kW	250 kVA / 225 kW	250 kVA / 200 kW	250 kVA / 175 kW
300 kW/kVA	300 kVA / 210 kW	300 kVA / 240 kW	300 kVA / 270 kW	300 kVA / 270 kW	300 kVA / 240 kW	300 kVA / 210 kW
350 kW/kVA	350 kVA / 245 kW	350 kVA / 280 kW	350 kVA / 315 kW	350 kVA / 315 kW	350 kVA / 280 kW	350 kVA / 245 kW
400 kW/kVA	400 kVA / 280 kW	400 kVA / 320 kW	400 kVA / 360 kW	400 kVA / 360 kW	400 kVA / 320 kW	400 kVA / 280 kW
450 kW/kVA	450 kVA / 315 kW	450 kVA / 360 kW	450 kVA / 405 kW	450 kVA / 405 kW	450 kVA / 360 kW	450 kVA / 315 kW
500 kW/kVA	500 kVA / 350 kW	500 kVA / 400 kW	500 kVA / 450 kW	500 kVA / 450 kW	500 kVA / 400 kW	500 kVA / 350 kW

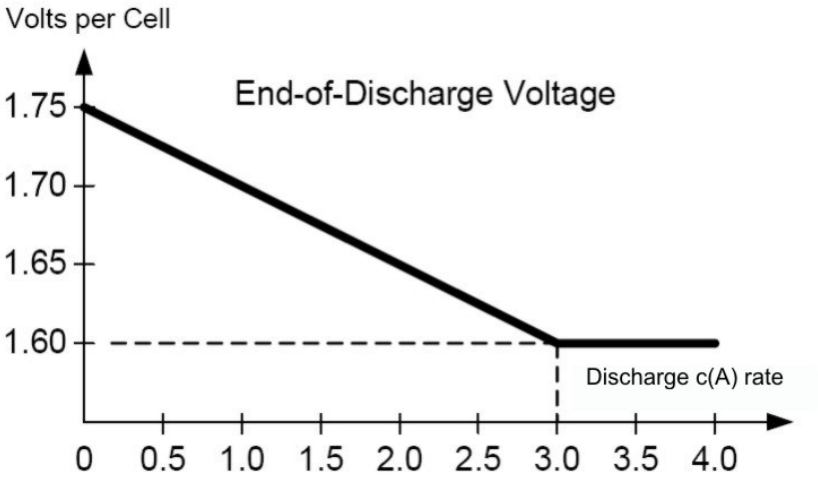
Leakage Current

For a 480 V UPS system 3-wire installation at 100% load the leakage current is 42.5 mA.

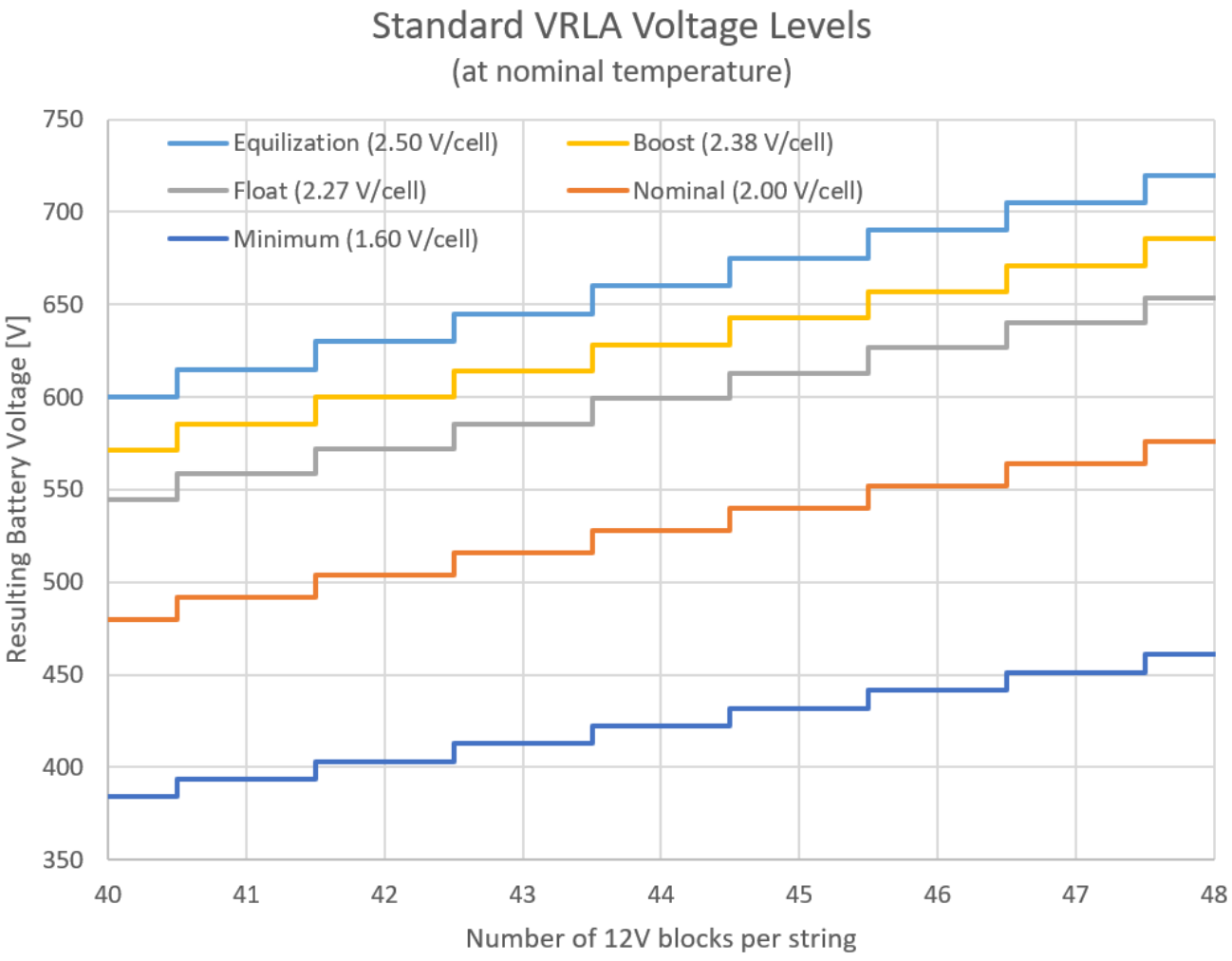
Batteries

End of Discharge Voltage

The voltage is 1.6 to 1.75 per cell depending on discharge ratio.



Standard VRLA Voltage Levels



NOTE: Specific configurations may differ from the general constraint shown above.

Classic Battery Cabinet Runtimes for 400 V

Battery runtimes are listed in minutes at 100% load. Battery runtimes are estimated values based on battery manufacturer data for operation at 25 °C.

Please note that not all battery solutions are available for all UPS ratings due to:

- The number of battery blocks in the specific battery solution differs from the specific UPS requirements.
- The specific battery solution would provide less than 5 minutes runtime with the specific UPS.
- The battery breaker rating in the specific battery solution does not match the specific UPS rating.

UPS rating	**200 kW**	**250 kW**	**300 kW**	**350 kW**	**400 kW**	**450 kW**	**500 kW**
Power factor	**1**						
2 x GVSCBC10A2	7.9	5.4	–	–	–	–	–
2 x GVSCBC10B2	12.5	8.5	6	–	–	–	–
3 x GVSCBC10A2	14.0	10.0	7.9	6.1	–	–	–
3 x GVSCBC10B2	22.5	16.5	12.5	9.7	7.6	5.9	–
4 x GVSCBC10A2	21.0	15.0	12.0	9.7	8.0	6.5	5.4
4 x GVSCBC10B2	33.5	25.0	19.5	15.5	12.5	10.0	8.6

Compliance

Safety	IEC 62040-1: 2008-06, 1st edition Uninterruptible Power Systems (UPS) - Part 1: General and safety requirements for UPS IEC 62040-1: 2013-01, 1st edition amendment 1 UL 1778 5th edition
EMC/EMI/RFI	IEC 62040-2: 2016-11, 2nd edition Uninterruptible Power Systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements C2 FCC Part 15 Subpart B, Class A IEEE C62.41-1991 Location Category B2, IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits
Performance	Performance in accordance with: IEC 62040-3: 2011-03, 2nd edition Uninterruptible Power Systems (UPS) - Part 3: Method of specifying the performance and test requirements. Output performance classification (according to IEC 62040-3, Clause 5.3.4): VFI-SS-111
Transportation	IEC 60721-4-2 Level 2M2
Seismic	ICC-ES AC 156 (2015); OSHPD Pre-approved; Sds=1.45 g for z/h=1 and Sds=2.00 g for z/h=0; Ip=1.5
Earthing system	TN, TT, TNC, IT

Regional Seismic Compliance

Certificate available upon request.

Country/Region	**Code ID**	**Hazard level ground**	**Hazard level roof**
Argentina	INPRES-CIRSOC103	Zone 4	Zone 4
Australia	AS 1170.4-2007	Z = 0.22	Z = 0.22
Canada[1]	2020 NBCC	S_a = 1.95	S_a = 1.44
Chile	NCh 433.Of1996	Zone 3	Zone 2
China	GB 50011-2010 (2016)	α_{Max} = 1.4	α_{Max} = 0.9
Europe	Eurocode 8 EN1998-1	α_{gR} = 0.375	α_{gR} = 0.25
India	IS 1893 (Part 1) : 2016	Z = 0.36	Z = 0.36
Japan	Building Standard Law	Zone A	Zone A
New Zealand	NZS 1170.5:2004+A1	Z = 0.54	Z = 0.37
Peru	N.T.E. - E.030	Zone 4	Zone 4
Russia	SNIP II-7-81 (SP 14.13330.2014)	MSK 9	MSK 9
Taiwan	CPA 2011 Seismic Design Code	S_S^D = 0.8	S_S^D = 0.8
U.S.A.[1]	ASCE 7-16 / IBC 2018	S_{DS} = 1.98	S_{DS} = 1.45

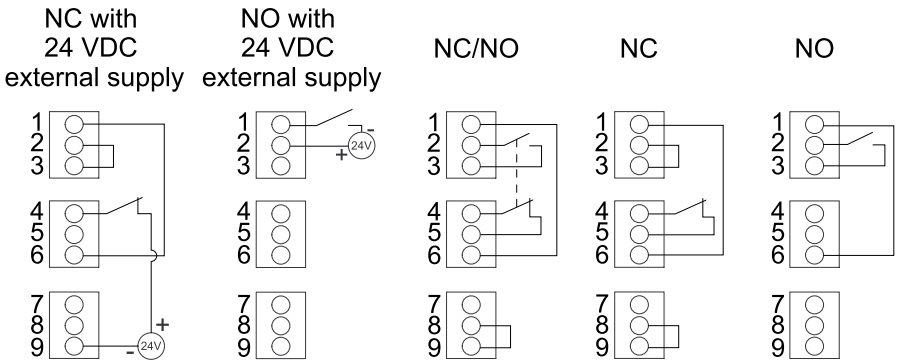
1. OSHPD Pre-approved in accordance with AC156 test protocol.

Communication and Management

Local area network	1 Gbps – 1 port as default
Modbus	Modbus (SCADA)
Output relays	4 x SELV configurable
Input contacts	4 x SELV configurable
Standard control panel	4.3 inch touchscreen display
Audible alarm	Yes
Emergency Power Off (EPO)	Options: • Normally Open (NO) • Normally Closed (NC) • External 24 VDC SELV
External switchgear	UIB UOB SSIB MBB SIB
External synchronization	No
Battery monitoring	Available for external battery solutions

EPO

EPO Configurations (Terminal J6600, 1-9)



The EPO input supports 24 VDC.

NOTE: The default setting for the EPO activation is to turn off the inverter.

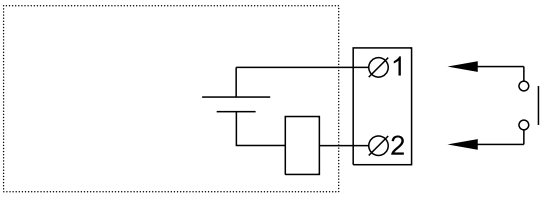
If you want the EPO activation to transfer the UPS into forced static bypass operation instead, please contact Schneider Electric.

Configurable Input Contacts and Output Relays

Input Contacts

Four input contacts are available and can be configured to indicate a given event via the display.

The input contacts support 24 VDC 10 mA. All circuits connected must have the same 0 V reference.

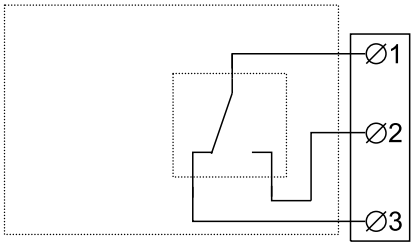


Name	Description	Location
IN _1 (input contact 1)	Configurable input contact	Terminal J6616, 1-2
IN _2 (input contact 2)		Terminal J6616, 3-4
IN _3 (input contact 3)		Terminal J6616, 5-6
IN _4 (input contact 4)		Terminal J6616, 7-8

Output Relays

Four output relays are available and can be configured to activate on one or more events via the display.

The output relays support 24 VAC/VDC 1 A. All external circuitry must be fused with maximum 1 A fast acting fuses.



Name	Description	Location
OUT _1 (output relay 1)	Configurable output relay	Terminal J6617, 1-3
OUT _2 (output relay 2)		Terminal J6617, 4-6
OUT _3 (output relay 3)		Terminal J6617, 7-9
OUT _4 (output relay 4)		Terminal J6617, 10-12

When **Energized check mode** is enabled, the output relay is activated, and will deactivate when the events assigned to the output relay occurs (normally activated).

Energized check mode must be individually enabled for each output relay and makes it possible to detect if the output relay is inoperable:

- If the power supply to the output relays is lost, the events assigned to all the output relays will be indicated as present.
- If a single output relay has become inoperable, the events assigned to the single output relay will be indicated as present.

Requirements for a Third Party Battery Solution

Battery breaker boxes from Schneider Electric are recommended for the battery interface. Please contact Schneider Electric for more information.

Third Party Battery Breaker Requirements

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- All selected battery breakers must be equipped with instantaneous trip functionality with an undervoltage release coil or a shunt trip release coil.
- Trip delay must be set to zero on all battery breakers.

Failure to follow these instructions will result in death or serious injury.

NOTE: There are more factors to consider when selecting a battery breaker than the requirements listed below. Please contact Schneider Electric for more information.

Design Requirements for Battery Breaker

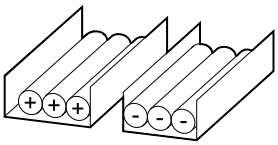
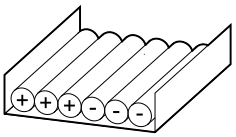
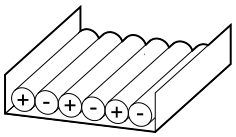
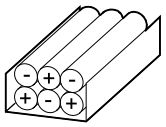
Battery breaker rated DC voltage > Normal battery voltage	The normal voltage of the battery configuration is defined as the highest nominal occurring battery voltage. This can be equivalent to the float voltage which may be defined as **number of battery blocks x number of cells x cell float voltage**.
Battery breaker rated DC current > Rated discharge battery current	This current is controlled by the UPS and must include maximum discharge current. This will typically be the current at the end of discharge (minimum operation DC voltage or in overload condition or a combination).
DC landings	Two DC landings for DC cables (DC+ and DC-) are required.
AUX switches for monitoring	One AUX switch must be installed in each battery breaker and connected to the UPS. The UPS can monitor up to four battery breakers.
Short-circuit breaking capability	The short-circuit breaking capability must be higher than the short-circuit DC current of the (largest) battery configuration.
Minimum trip current	The minimum short-circuit current to trip the battery breaker must match the (smallest) battery configuration, to make the breaker trip in case of a short circuit, up to the end of its life time.

Guidance for Organizing Battery Cables

NOTE: For 3rd party batteries, use only high rate batteries for UPS applications.

NOTE: When the battery bank is placed remotely, the organizing of the cables is important to reduce voltage drop and inductance. The distance between the battery bank and the UPS must not exceed 200 m (656 ft). Contact Schneider Electric for installations with a longer distance.

NOTE: To minimize the risk of electromagnetic radiation, it is highly recommended to follow the below guidance and to use grounded metallic tray supports.

Cable Length				
<30 m	Not recommended	Acceptable	Recommended	Recommended
31–75 m	Not recommended	Not recommended	Acceptable	Recommended
76–150 m	Not recommended	Not recommended	Acceptable	Recommended
151–200 m	Not recommended	Not recommended	Not recommended	Recommended

Specifications

Specifications for 200 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[2] (L1, L2, L3, N, G) or 3-wire[2] (L1, L2, L3, G) Dual mains: 3-wire[2] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	316	299	288	272	249
	Maximum input current (A)	364	359	346	326	298
	Input current limitation (A)	364	364	360	336	308
	Total harmonic distortion (THDI)	<5% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±0.1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	307	292	281	265	243
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

2. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[3]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 110% continuous, 1000% for 60 milliseconds (bypass operation)				150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 125% continuous, 1000% for 60 milliseconds (bypass operation)
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	304	289	278	262	241
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	2.5				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 160 100% load: 30	0-40% load: 160 100% load: 40			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C for T < 25 °C				
	End of discharge voltage (full load) (VDC)	384				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	434				
	Battery current at full load and minimum battery voltage (A)	543				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

3. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.

Specifications for 250 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[4] (L1, L2, L3, N, G) or 3-wire[4] (L1, L2, L3, G) Dual mains: 3-wire[4] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	395	374	360	340	311
	Maximum input current (A)	455	449	432	408	373
	Input current limitation (A)	455	455	450	420	385
	Total harmonic distortion (THDI)	<5% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±0.1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	384	364	351	331	304
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

4. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[5]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 110% continuous, 1000% for 60 milliseconds (bypass operation)				150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 125% continuous, 1000% for 60 milliseconds (bypass operation)
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	380	361	348	328	301
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	2.5				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 200 100% load: 37.5	0-40% load: 200 100% load: 50			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C for T < 25 °C				
	End of discharge voltage (full load) (VDC)	384				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	543				
	Battery current at full load and minimum battery voltage (A)	678				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

5. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.

Specifications for 300 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[6] (L1, L2, L3, N, G) or 3-wire[6] (L1, L2, L3, G) Dual mains: 3-wire[6] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	474	449	432	408	373
	Maximum input current (A)	546	539	519	490	447
	Input current limitation (A)	546	546	540	504	462
	Total harmonic distortion (THDI)	<5% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±0.1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	460	437	422	398	364
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

6. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[7]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 110% continuous, 1000% for 60 milliseconds (bypass operation)				150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 125% continuous, 1000% for 60 milliseconds (bypass operation)
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	456	433	417	394	361
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	2.5				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 240 100% load: 45	0-40% load: 240 100% load: 60			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C for T < 25 °C				
	End of discharge voltage (full load) (VDC)	384				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	651				
	Battery current at full load and minimum battery voltage (A)	814				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

7. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.

Specifications for 350 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[8] (L1, L2, L3, N, G) or 3-wire[8] (L1, L2, L3, G) Dual mains: 3-wire[8] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	553	524	505	476	435
	Maximum input current (A)	637	629	605	571	522
	Input current limitation (A)	637	637	630	588	539
	Total harmonic distortion (THDI)	<5% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±0.1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	537	510	492	464	425
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

8. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[9]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 110% continuous, 1000% for 60 milliseconds (bypass operation)				150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 125% continuous, 1000% for 60 milliseconds (bypass operation)
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	532	505	487	459	421
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	2.5				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 280 100% load: 52.5	0-40% load: 280 100% load: 70			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C for T < 25 °C				
	End of discharge voltage (full load) (VDC)	384				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	760				
	Battery current at full load and minimum battery voltage (A)	949				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

9. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.

Specifications for 400 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[10] (L1, L2, L3, N, G) or 3-wire[10] (L1, L2, L3, G) Dual mains: 3-wire[10] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	632	599	577	544	497
	Maximum input current (A)	728	719	692	653	596
	Input current limitation (A)	728	728	720	672	616
	Total harmonic distortion (THDI)	<5% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±0.1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	614	583	562	691	486
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

10. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[11]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 110% continuous, 1000% for 60 milliseconds (bypass operation)				150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 125% continuous, 1000% for 60 milliseconds (bypass operation)
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	608	577	556	525	481
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	2.5				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 320 100% load: 60	0-40% load: 320 100% load: 80			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C for T < 25 °C				
	End of discharge voltage (full load) (VDC)	384				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	868				
	Battery current at full load and minimum battery voltage (A)	1085				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

11. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.

Specifications for 450 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[12] (L1, L2, L3, N, G) or 3-wire[12] (L1, L2, L3, G) Dual mains: 3-wire[12] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	711	674	649	612	559
	Maximum input current (A)	819	809	778	734	671
	Input current limitation (A)	819	819	810	756	693
	Total harmonic distortion (THDI)	<5% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±0.1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	691	656	632	596	547
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

12. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[13]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 110% continuous, 1000% for 60 milliseconds (bypass operation)				150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 125% continuous, 1000% for 60 milliseconds (bypass operation)
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	684	650	626	590	541
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	2.5				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 360 100% load: 67.5	0-40% load: 360 100% load: 90			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C for T < 25 °C				
	End of discharge voltage (full load) (VDC)	384				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	977				
	Battery current at full load and minimum battery voltage (A)	1221				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

13. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.

Specifications for 500 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[14] (L1, L2, L3, N, G) or 3-wire[14] (L1, L2, L3, G) Dual mains: 3-wire[14] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	790	749	721	680	621
	Maximum input current (A)	910	898	865	816	746
	Input current limitation (A)	910	910	900	840	770
	Total harmonic distortion (THDI)	<5% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±0.1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	767	729	703	663	607
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

14. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[15]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 110% continuous, 1000% for 60 milliseconds (bypass operation)				150% for 1 minute, 125% for 10 minutes (normal operation) 125% for 1 minute (battery operation) 125% continuous, 1000% for 60 milliseconds (bypass operation)
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	760	722	696	656	601
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	2.5				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 400 100% load: 75	0-40% load: 400 100% load: 100			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C for T < 25 °C				
	End of discharge voltage (full load) (VDC)	384				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	1085				
	Battery current at full load and minimum battery voltage (A)	1356				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

15. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.

Upstream and Downstream Protection for IEC

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Circuit breakers must have instantaneous trip time of maximum 60 ms.
- Circuit breakers must have instantaneous override values set according to the table below.
- Circuit breakers must be installed for input (unit input breaker UIB) and bypass (static switch input breaker SSIB).
- Circuit breakers must be installed for the output (unit output breaker UOB) of each UPS in a parallel system.

Failure to follow these instructions will result in death or serious injury.

NOTE: For local directives which require 4-pole circuit breakers: If neutral conductor is expected to carry a high current, due to line-neutral non-linear load, the circuit breaker must be rated according to expected neutral current.

Recommended Upstream Protection for IEC

UPS rating	200 kW		250 kW	
	Input	Bypass	Input	Bypass
Breaker type	NSX400H Mic 2.2 (LV432695)	NSX400H Mic 2.2 (LV432695)	NSX630H Mic 2.2 (LV432895)	NSX400H Mic 2.2 (LV432695)
Io	400	320	500	400
Ir	1	1	1	1
Isd	≤10	≤10	≤10	≤10

UPS rating	300 kW		350 kW		400 kW	
	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	NSX630H Mic 2.2 (LV432895)	NSX630H Mic 2.2 (LV432895)	NS800H Mic 5.0 (33553)	NSX630H Mic 2.2 (LV432895)	NS800H Mic 5.0 (33553)	NSX630H Mic 2.2 (LV432895)
Io	1	1	0.8	0.96	0.95	1
Ir	570	500	—	570	—	630
tr	–	–	≥4	–	≥4	–
Ii (x In)	—	—	≤10	—	≤10	—
Isd	≤10	≤10	≤10	≤10	≤10	≤10

UPS rating	450 kW		500 kW	
	Input	Bypass	Input	Bypass
Breaker type	NS1000H Mic 5.0 (33559)	NS800H Mic 5.0 (33553)	NS1000H Mic 5.0 (33559)	NS800H Mic 5.0 (33553)
Ir	0.9	0.9	0.95	0.95
tr	≥4	≥4	≥4	≥4
Ii (x In)	≤8	≤10	≤8	≤10

Recommended Downstream Protection for IEC

NOTE: The recommended downstream protection given below is not valid for tripping the breaker when the UPS is in battery operation, only for tripping the breaker when the UPS is in static bypass operation.

UPS rating	**200 kW**	**250 kW**	**300 kW**	**350 kW**	**400 kW**	**450 kW**	**500 kW**
Breaker type	NSX160H Mic 2.2		NSX250H Mic 2.2				
Ir	160		250				
Isd	10		10				

Recommended Cable Sizes for IEC

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- All wiring must comply with all applicable national and/or electrical codes.
- The maximum allowable cable size is 240 mm².
- Shrink sleeve must be fitted over cable lug crimped zone and must overlap with the cable insulation on all power cables.

Failure to follow these instructions will result in death or serious injury.

The maximum number of cable connections per busbar:

- 4 on input/output/bypass busbars
- 4 x 240 mm² or 8 x 150 mm² on DC+/DC- busbars
- 8 on N busbar
- 16 on PE busbar

NOTE: Overcurrent protection is to be provided by others.

Cable sizes in this manual are based on the minimum requirements in table B.52.3 and table B.52.5 of IEC 60364-5-52 with the following assertions:

- 90 °C conductors
- An ambient temperature of 30 °C
- Use of copper or aluminum conductors
- Installation method C

PE cable size is based on table 54.2 of IEC 60364-4-54.

If the ambient temperature is greater than 30 °C, larger conductors are to be selected in accordance with the correction factors of the IEC.

Copper

UPS rating	**200 kW**				**250 kW**				**300 kW**				**350 kW**			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm²)	1 x 185	1 x 185	1 x 150	1 x 150	2 x 120	2 x 120	2 x 120	1 x 240	2 x 150	2 x 150	2 x 150	2 x 120	2 x 185	2 x 185	2 x 150	2 x 150
Input PE (mm²)	1 x 95	1 x 95	1 x 95	1 x 95	1 x 120	1 x 120	1 x 120	1 x 120	1 x 150	1 x 150	1 x 150	1 x 120	1 x 185	1 x 185	1 x 150	1 x 150
Bypass/output phases (mm²)	1 x 120	1 x 120	1 x 120	1 x 120	1 x 185	1 x 185	1 x 150	1 x 150	2 x 120	1 x 240	1 x 240	1 x 185	2 x 150	2 x 150	2 x 120	2 x 120
Bypass PE/output PE (mm²)	1 x 70	1 x 70	1 x 70	1 x 70	1 x 95	1 x 95	1 x 95	1 x 95	1 x 120	1 x 120	1 x 120	1 x 95	1 x 150	1 x 150	1 x 120	1 x 120
Neutral (mm²)	1 x 120	1 x 120	1 x 120	1 x 120	1 x 185	1 x 185	1 x 150	1 x 150	2 x 120	1 x 240	1 x 240	1 x 185	2 x 150	2 x 150	2 x 120	2 x 120
DC+/DC- (mm²)	1 x 240				2 x 150				2 x 185				2 x 240			
DC PE (mm²)	1 x 120				1 x 150				1 x 185				1 x 240			

Copper

UPS rating	**400 kW**				**450 kW**				**500 kW**			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm²)	2 x 240	2 x 240	2 x 185	2 x 185	3 x 185	3 x 185	3 x 185	2 x 240	3 x 185	3 x 185	3 x 185	3 x 185
Input PE (mm²)	1 x 240	1 x 240	1 x 185	1 x 185	2 x 150	2 x 150	2 x 150	1 x 240	2 x 150	2 x 150	2 x 150	2 x 150
Bypass/output phases (mm²)	2 x 150	2 x 150	2 x 150	2 x 150	2 x 185	2 x 185	2 x 185	2 x 150	2 x 240	2 x 240	2 x 185	2 x 185

Copper (Continued)

UPS rating	400 kW				450 kW				500 kW			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Bypass PE/output PE (mm^2)	1 x 150	1 x 150	1 x 150	1 x 150	1 x 185	1 x 185	1 x 185	1 x 150	1 x 240	1 x 240	1 x 185	1 x 185
Neutral (mm^2)	2 x 150	2 x 150	2 x 150	2 x 150	2 x 185	2 x 185	2 x 185	2 x 150	2 x 240	2 x 240	2 x 185	2 x 185
DC+/DC- (mm^2)	3 x 185				3 x 240				3 x 240			
DC PE (mm^2)	2 x 150				2 x 185				2 x 185			

Aluminum

UPS rating	200 kW				250 kW				300 kW				350 kW			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm^2)	1 x 240	1 x 240	1 x 240	1 x 240	2 x 185	2 x 185	2 x 185	2 x 150	2 x 240	2 x 240	2 x 240	2 x 185	2 x 240	2 x 240	2 x 240	2 x 240
Input PE (mm^2)	1 x 120	1 x 120	1 x 120	1 x 120	1 x 185	1 x 185	1 x 185	1 x 150	1 x 240	1 x 240	1 x 240	1 x 185	1 x 240	1 x 240	1 x 240	1 x 240
Bypass/output phases (mm^2)	1 x 185	1 x 185	1 x 185	1 x 150	2 x 120	1 x 240	1 x 240	1 x 240	2 x 185	2 x 150	2 x 150	2 x 120	2 x 240	2 x 240	2 x 185	2 x 185
Bypass PE/output PE (mm^2)	1 x 95	1 x 95	1 x 95	1 x 95	1 x 120	1 x 120	1 x 120	1 x 120	1 x 185	1 x 150	1 x 150	1 x 120	1 x 240	1 x 240	1 x 185	1 x 185
Neutral (mm^2)	1 x 185	1 x 185	1 x 185	1 x 150	2 x 120	1 x 240	1 x 240	1 x 240	2 x 185	2 x 150	2 x 150	2 x 120	2 x 240	2 x 240	2 x 185	2 x 185
DC+/DC- (mm^2)	2 x 150				2 x 240				3 x 185				3 x 240			
DC PE (mm^2)	1 x 150				1 x 240				2 x 150				2 x 185			

Aluminum

UPS rating	400 kW				450 kW				500 kW			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm^2)	3 x 185	3 x 185	3 x 185	3 x 185	3 x 240	3 x 240	3 x 240	3 x 185	4 x 185	4 x 185	3 x 240	3 x 240
Input PE (mm^2)	2 x 150	2 x 150	2 x 150	2 x 150	2 x 185	2 x 185	2 x 185	2 x 150	2 x 185	2 x 185	2 x 185	2 x 185
Bypass/output phases (mm^2)	2 x 240	2 x 240	2 x 240	2 x 240	3 x 185	3 x 185	2 x 240	2 x 240	3 x 240	3 x 185	3 x 185	3 x 185
Bypass PE/output PE (mm^2)	1 x 240	1 x 240	1 x 240	1 x 240	2 x 150	2 x 150	1 x 240	1 x 240	2 x 185	2 x 150	2 x 150	2 x 150
Neutral (mm^2)	2 x 240	2 x 240	2 x 240	2 x 240	3 x 185	3 x 185	2 x 240	2 x 240	3 x 240	3 x 185	3 x 185	3 x 185
DC+/DC- (mm^2)	4 x 185				4 x 240				—			
DC PE (mm^2)	2 x 185				2 x 240				3 x 240			

Guidance for Organizing Input, Bypass, And Output Cables

NOTICE

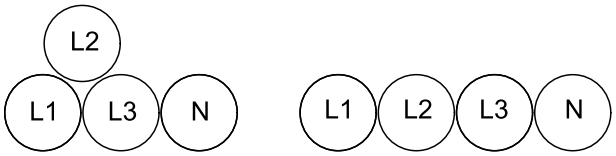
RISK OF EQUIPMENT DAMAGE

To ensure correct load sharing in bypass operation in a parallel system:

- All bypass cables must be the same length for all UPSs.
- All output cables must be the same length for all UPSs.
- All input cables must be the same length for all UPSs (only required in single mains system).

Failure to follow these instructions can result in equipment damage.

The input, bypass, and output cables must be grouped in circuits. On raceways, use one of the two shown cable formations.



Torque Specifications

Bolt size	Torque
M6	5 Nm
M8	17.5 Nm
M10	30 Nm
M12	50 Nm

Physical

UPS Shipping Weights and Dimensions

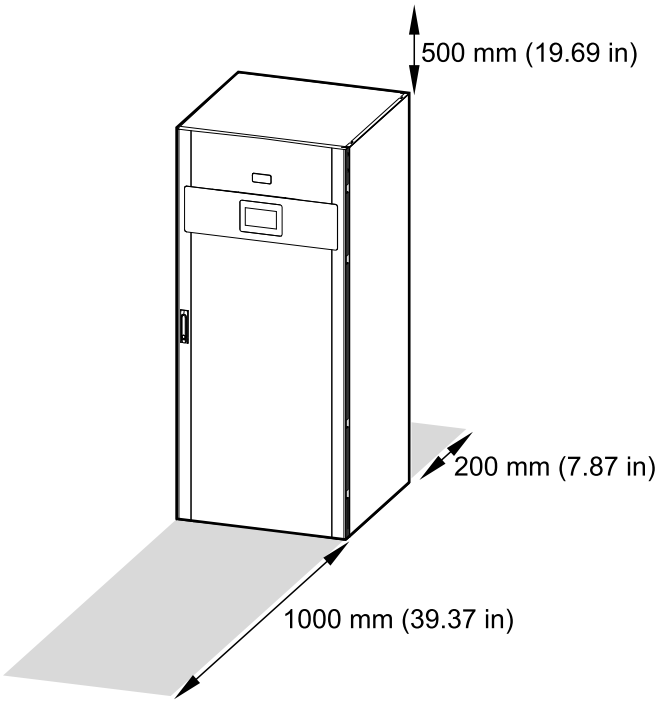
UPS rating	Weight kg	Height mm	Width mm	Depth mm
200 kW	620	2145	950	1100
250 kW – UPS – 1 separately shipped power module	620 62	2145 330	950 580	1100 780
300 kW – UPS – 2 separately shipped power modules	620 2x62	2145 2x330	950 2x580	1100 2x780
350 kW – UPS – 3 separately shipped power modules	620 3x62	2145 3x330	950 3x580	1100 3x780
400 kW – UPS – 4 separately shipped power modules	620 4x62	2145 4x330	950 4x580	1100 4x780
450 kW – UPS – 5 separately shipped power modules	620 5x62	2145 5x330	950 5x580	1100 5x780
500 kW – UPS – 6 separately shipped power modules	620 6x62	2145 6x330	950 6x580	1100 6x780

UPS Weights and Dimensions

UPS rating	Weight kg	Height mm	Width mm	Depth mm
200 kW	495	1970	850	925
250 kW	532	1970	850	925
300 kW	570	1970	850	925
350 kW	607	1970	850	925
400 kW	645	1970	850	925
450 kW	683	1970	850	925
500 kW	720	1970	850	925

Clearance

NOTE: Clearance dimensions are published for airflow and service access only. Consult with the local safety codes and standards for additional requirements in your local area.



Environment

	Operating	Storage
Temperature	0 °C to 40 °C without load derating.	-25 °C to 55 °C for systems without batteries.
Relative humidity	0-95% non-condensing	10-80% non-condensing
Elevation	Designed for operation in 0-3000 m elevation. Derating required from 1000-3000 m with forced air cooling: Up to 1000 m: 1.000 Up to 1500 m : 0.975 Up to 2000 m: 0.950 Up to 2500 m: 0.925 Up to 3000 m: 0.900 Derating required from 1000-3000 m with convection cooling: Up to 1000 m: 1.000 Up to 1500 m : 0.985 Up to 2000 m: 0.970 Up to 2500 m: 0.955 Up to 3000 m: 0.940	
Audible noise one meter from unit	62 dB at 70% load 69.5 dB at 100% load for 400 V systems	
Protection class	IP20	
Color	RAL 9003, gloss level 85%	

Heat Dissipation in BTU/hr

NOTE: These values are preliminary and may be subject to change pending tests.

500 kW	**Normal operation**		
Voltage (V)	**380**	**400**	**415**
25% load	15011	15011	15469
50% load	26381	25476	25476
75% load	42298	40116	38214
100% load	61876	59132	56397

Airflow Values

Indicative Airflow Values in m^3/Hour Based on a 30 °C Environment

UPS rating	200 kW	250 kW	300 kW	350 kW	400 kW	450 kW	500 kW
50% load	1617	1920	2223	2526	2829	3132	3435
75% load	2102	2526	2950	3375	3799	4223	4749
90% load	2344	2829	3314	3799	4365	4911	5436
100% load	2405	2905	3405	3905	4547	5087	5709

Indicative Airflow Values in m^3/Hour Based on a 40 °C Environment

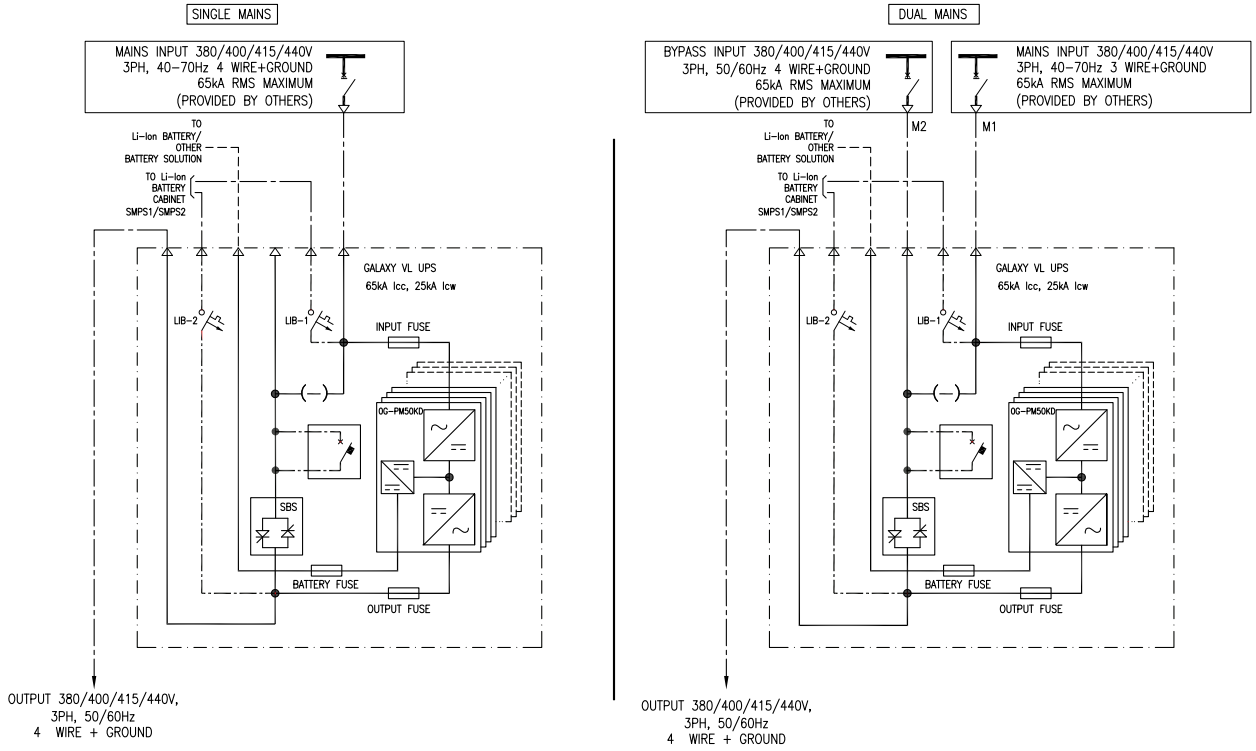
UPS rating	200 kW	250 kW	300 kW	350 kW	400 kW	450 kW	500 kW
50% load	1920	2299	2678	3056	3435	3814	4193
75% load	2284	2753	3223	3693	4163	4774	5284
90% load	2465	2981	3496	4112	4668	5224	5860
100% load	2647	3208	3769	4471	5072	5754	6416

Drawings

NOTE: A comprehensive set of drawings is available on www.se.com.

NOTE: These drawings are for reference ONLY – subject to change without notice.

Galaxy VL 200-500 kW 400 V UPS



Options

Configuration Options

- Compact design, high density technology, and modular architecture
- Single or dual mains
- Up to 4+0 UPSs in parallel for capacity
- Up to 3+1 UPSs in parallel for redundancy
- Default top cable entry
- ECO mode
- ECOnversion mode
- EcoStruxure IT compatible
- Generator compatible
- Touchscreen LCD
- Replacement of power module in any operation mode (Live Swap)[16]

16. In all systems that live up to the prerequisites for Live Swap.

Hardware Options

NOTE: All hardware options listed here may not be available in all regions.

Power Module

- Power module 50 kW (GVPM50KD)

Lithium-Ion Battery Cabinet

Battery cabinet including Lithium-Ion batteries and battery breaker.

- Lithium-Ion battery cabinet (LIBATTSMGEIEC)

Classic Battery Cabinets

Classic battery cabinet including batteries and battery breaker.

- 1010 mm wide, classic battery cabinet (GVSCBC10A2, GVSCBC10B2)

Empty Battery Cabinets

Empty battery cabinet for use with third party batteries. Battery breaker kit is required (sold separately).

- 700 mm wide empty classic battery cabinet (GVEBC7)
- 1100 mm wide empty classic battery cabinet (GVEBC11)
- 1500 mm wide empty classic battery cabinet (GVEBC15)

Battery Breaker Box

Wall mounted battery breaker box for use with third party battery solutions.

- 100-300 kW battery breaker box with one battery breaker (GVBBB630EL-1CB)
- 250-500 kW battery breaker box with two battery breakers (GVBBB630EL-2CB)
- 400-500 kW battery breaker box with three battery breakers (GVBBB630EL-3CB)

Battery Breaker Kit

Battery breaker kit for use with empty battery cabinets or third party battery solutions.

- 100-300 kW battery breaker kit (GVBBK630EL)

Maintenance Bypass Cabinet

Maintenance bypass cabinet for complete isolation of the UPS during service operations. Only for single UPS.

- 200-500 kW maintenance bypass cabinet with backfeed (GVLMBCA200K500H)

Bottom Entry Cabinet

Bottom entry cabinet for cable entry through the bottom of the system.

- Bottom entry cabinet (GVBEC)

Optional Installation Kits

- Seismic kit for UPS (GVLOPT002)
- Backfeed kit for UPS (GVLOPT004)
- Parallel kit for UPS (GVSOPT006)
- Li-Ion battery control breaker kit (GVLOPT005)

Optional Network Management Card

- Network Management Card LCES2 with Modbus, Ethernet and AUX sensors (AP9644)

Air Filter

- Performance air filter kit for UPS (GVLOPT001)

Temperature Sensors

- Temperature sensor for network management card (AP9335T)
- Temperature/humidity sensor for network management card (AP9335TH)

Weights and Dimensions for Options

NOTE: Not all options listed here are available for all UPS models. Refer to the hardware options list for the relevant UPS model.

Classic Battery Cabinet Shipping Weights and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVSCBC7A	600	1980	815	970
GVSCBC7B	768	1980	815	970
GVSCBC7C	940	1980	815	970
GVSCBC10A2	1300	1980	1130	970
GVSCBC10B2	1532	1980	1130	970

Classic Battery Cabinet Weights and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVSCBC7A	580	1900	710	845
GVSCBC7B	748	1900	710	845
GVSCBC7C	920	1900	710	845
GVSCBC10A2	1280	1900	1010	845
GVSCBC10B2	1512	1900	1010	845

Maintenance Bypass Cabinet Shipping Weights and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVLMBCA200K500H	212	2134	635	990

Maintenance Bypass Cabinet Weights and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVLMBCA200K500H	175	1970	500	847

Bottom Entry Cabinet Shipping Weight and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVBEC	96	2134	535	990

Bottom Entry Cabinet Weight and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVBEC	85	1970	400	850

Battery Breaker Box Shipping Weights and Dimensions

Commercial reference	Weight kg	Height mm[17]	Width mm	Depth mm
GVBBB630EL-1CB	40	560	800	1200
GVBBB630EL-2CB	71.5	560	1000	1200
GVBBB630EL-3CB	81.5	560	1000	1200

Battery Breaker Box Weights and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVBBB630EL-1CB	35	800	500	280
GVBBB630EL-2CB	66	1000	750	280
GVBBB630EL-3CB	76	1000	750	280

Empty Battery Cabinet Shipping Weight and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVEBC7	205	2100	930	970
GVEBC11	250	2100	1330	970
GVEBC15	405	2120	1700	1000

Empty Battery Cabinet Weight and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVEBC7	190	1970	700	850
GVEBC11	230	1970	1100	850
GVEBC15	390	1970	1500	854

Battery Breaker Kit Shipping Weights and Dimensions

Commercial reference	Weight kg	Height mm[17]	Width mm	Depth mm
GVBBK630EL	15	560	500	800

17. The product is packaged in a horizontal position, so the shipping height and depth dimensions differ from the product itself.

Battery Breaker Kit Weights and Dimensions

Commercial reference	Weight kg	Height mm	Width mm	Depth mm
GVBBK630EL	12	520	290	240

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One-Year Factory Warranty

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