

Development of the Small Capacity UPS “SANUPS E11A Tower Type”

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1. Introduction

Previously, the lineup for the small capacity UPS “SANUPS E11A Series” consisted of only the 19-inch rack mounting standard type.

Since UPS with output capacity of 1 kVA and 1.5 kVA can be used connected to wall outlets, customers sometimes requested installation in spaces such as under or to the side of a desk.

With this as background, we have developed the “SANUPS E11A102,152 tower type” as a vertical mounted device that can be installed in various locations.

This document introduces the features of the “SANUPS E11A102,152 tower type” (referred to as “tower type” hereafter).

2. Product Overview

The tower type has a shape that is resistant to tipping over due to its low height-to-width ratio, as seen by its 250 mm height and 150 mm width. Also, the front dimension is so compact that it can fit inside the dimensions of B5-sized paper, making it possible to install the tower type in narrow spaces such as under a desk.

Fig. 3 shows the size comparison of the tower type and the standard type.

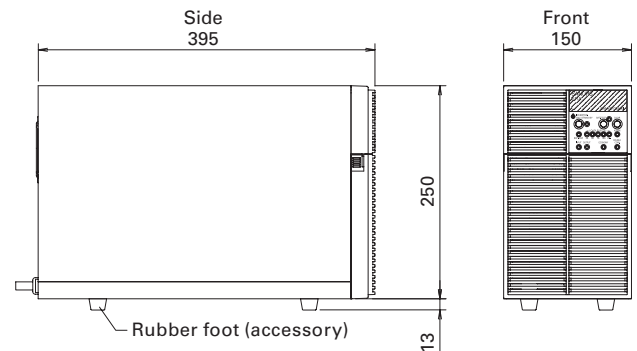


Fig. 1: “SANUPS E11A102 tower type” dimensions (unit: mm)

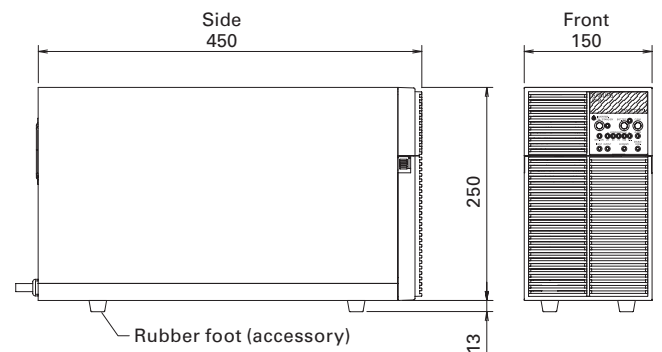


Fig. 2: “SANUPS E11A152 tower type” dimensions (unit: mm)

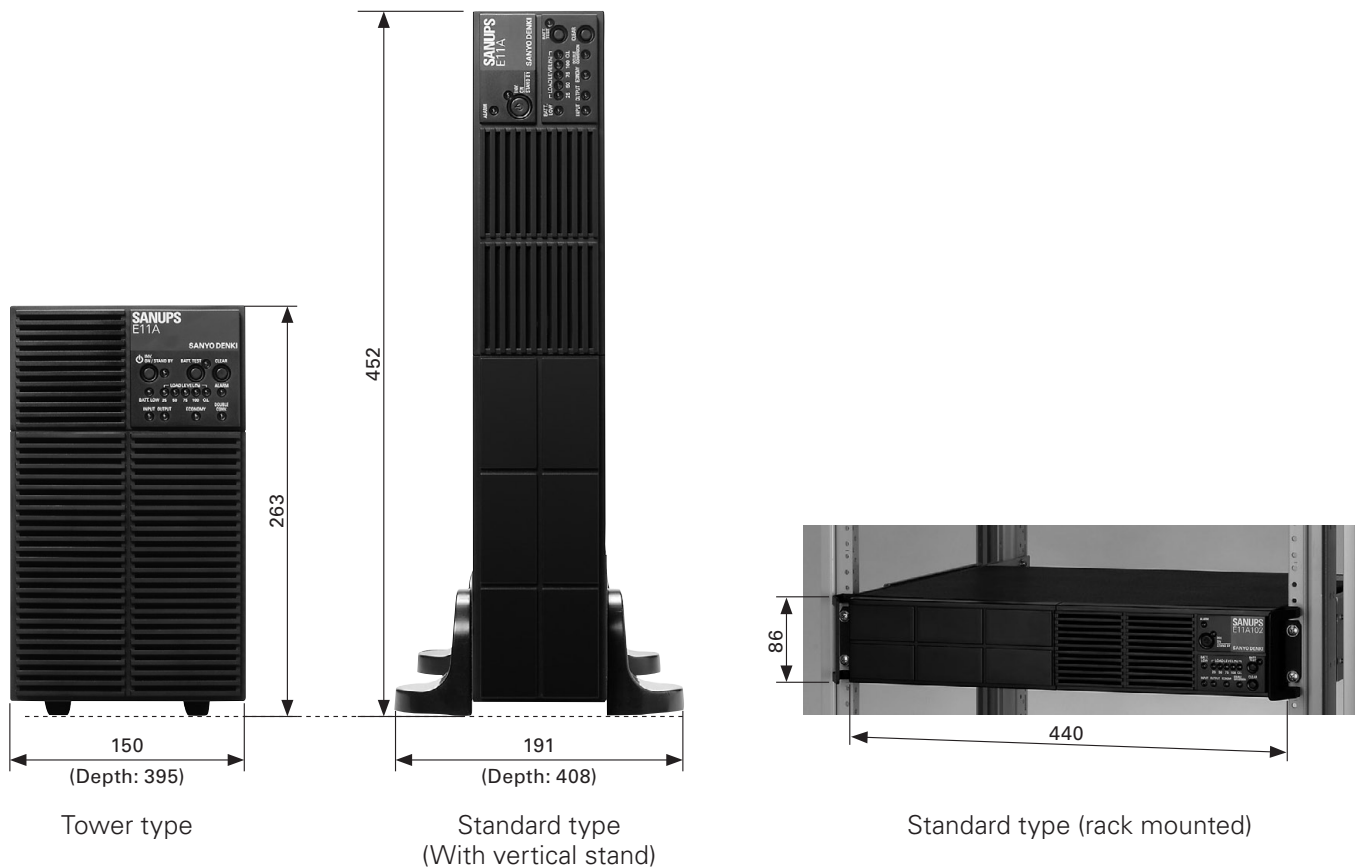


Fig. 3: "SANUPS E11A" size comparison (unit: mm)

3. Product Features

3.1 Space saving

Making a small-sized and space-saving tower type structure cannot be achieved simply by changing the parts layout of the standard type. Therefore, we achieved the small size and the space-saving features of the unit through the following:

- Reduced the size of the printed circuit board by redesigning the control circuit board
- Redesigned the radiator fin to match the vertical structure
- Reduced the number of used parts

As shown in Table 1 and Table 2, the volume of the device has been reduced to 96% for "SANUPS E11A102 tower type" and 89% for "SANUPS E11A152 tower type" compared to the standard type. Also, the installation area is 76% for "SANUPS E11A102 tower type" and 71% for "SANUPS E11A152 tower type" compared to the space needed for the standard type mounted vertically with the stand, thus achieving space-saving features.

Table 1: "SANUPS E11A102" comparison

		Tower type	Standard type	Remarks
Dimensions (mm)	W	150	191*	
	D	395	408	
	H	250	452*	
Volume (cm ³)		14,813	15,439	Volume ratio 96%
Installation area (cm ²)		593	779*	Area ratio 76%

* When vertical stand is mounted

Table 2: "SANUPS E11A152" comparison

		Tower type	Standard type	Remarks
Dimensions (mm)	W	150	191*	
	D	450	500	
	H	250	452*	
Volume (cm ³)		16,875	18,920	Volume ratio 89%
Installation area (cm ²)		675	955*	Area ratio 71%

* When vertical stand is mounted

3.2 Safety

A floor fixing metal bracket for the tower type is available for customers who have strict earthquake resistant requirements. By mounting the floor fixing metal bracket onto the base of the tower type, the tower type can be fixed to the floor using bolts.

The floor fixing metal bracket is constructed so it can be easily fixed to the tower type with hooking tabs and one screw. Therefore, customers can easily install the floor fixing metal bracket as necessary, even after the tower type has been installed.

Fig. 4 shows the mounting method for the floor fixing metal bracket.

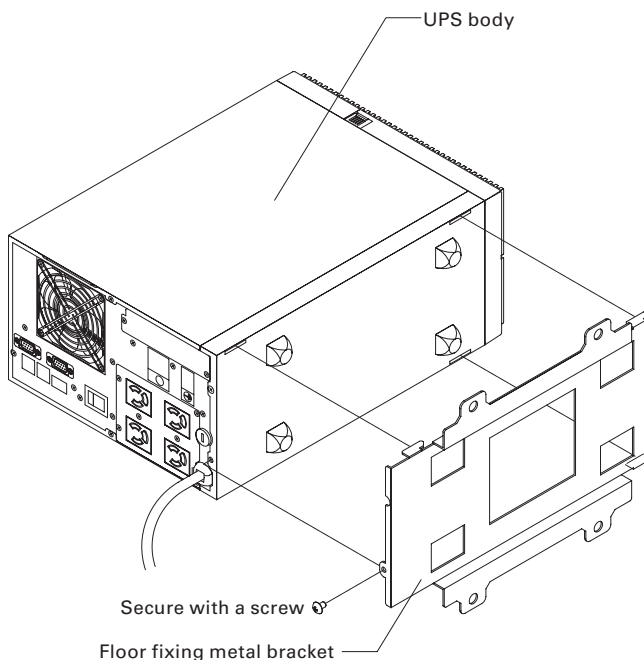


Fig. 4: Floor fixing metal bracket mounting method

3.3 High efficiency, high reliability

The tower type is smaller in size compared to the standard type, but it has adopted a circuit structure and a control method similar to the standard type, inheriting the high efficiency, high quality, and higher reliability of the functions and performances that are characteristics of the “SANUPS E11A” Series.

3.4 Expanded interface

The tower type is compatible with the following expanded interfaces, the same as the standard type, which can be used for various purposes.

- Power management by “SANUPS SOFTWARE STANDALONE” of Power management software (standard accessory)
- Power management in a network environment through a LAN interface card (optional)
- External transfer signal output of no-voltage contact through a contact signal interface card (optional)
- Remote operation of the UPS by a remote switch (optional)
- System control of the power supply by an outlet box (optional)

4. Specifications

Table 3 shows the standard specifications of this unit.

Table 3: "SANUPS E11A102,152 tower type" standard specifications

Item		Standard or characteristic		Remarks	
Type name		E11A102A0*1TW	E11A152A0*1TW	*: Remote operation and contact interface functions 0: Without the function 1: With the function	
Output capacity		1 kVA/0.7 kW	1.5 kVA/1.05 kW		
Cooling method		Forced air cooling			
AC input	Input plug	NEMA 5-15P			
	No. of phases	Single-phase 2 wires			
	Voltage	100,110,115,120 V		Configurable by the user (Rated value is equal to the output voltage)	
		-20% to +15%: Double conversion mode ± 5%: Economy or Active Filter mode operation when "Auto" is set ± 8%: Economy mode operation when "Economy" is set			
	Frequency	50 Hz or 60 Hz		± 8%: Double conversion mode ± 1, 3, 5%: Economy or Active Filter mode	
	Required capacity	0.9 kVA	1.36 kVA	Maximum capacity when charging the battery	
Input power factor	0.95 or more		During rated output ^(note 2)		
AC output	Outlet	NEMA 5-15R × 4			
	No. of phases	Single-phase 2 wires			
	Voltage	100,110,115,120 V		Configurable by the user	
	Voltage setting precision	Rating voltage ± 2%		When set to the Double conversion mode	
	Frequency	50 Hz or 60 Hz		Same as the input frequency (automatic selection)	
	Frequency precision	Rated frequency ± 1%, when set to Double conversion mode Rated frequency ± 1, 3, 5%, Auto or Economy setting		1, 3, 5% settings can be changed When UPS running on standalone: ± 0.5%	
	Voltage waveform	Sine wave			
	Voltage waveform distortion factor	During linear load: 3% or less During 100% wave rectifier load: 8% or less		During rated output	
	Transient voltage variation	Rapid load factor change	Rated voltage ± 5% ^(note 2)		0 ⇔ 100% change or output switch
		Power outage/recovery			During rated output
		Rapid input voltage change			Change ± 10%
	Response time	5 cycles or less ^(note 2)			
	Load power factor	0.7 (lag)		Acceptable range: 0.7 (lag) to 1.0	
	Over-current protection action	Automatic switch to bypass circuit with 105% or more		With automatic return function	
	Overload capacity	Inverter	105%		200 ms
Bypass		15 A (fuse)	20 A (current protector)	200% 30 seconds, 800% 2 cycles (reference value)	
Battery	Method	Small-sized sealed lead acid battery			
	Rated capacity	68 W	102 W	Per 15 minutes	
	Quantity	2	3	12 V/1, serial	
	Backup time	5 minutes	5 minutes	Ambient temperature 25°C, during rated load, initial value	
Heat generation	125 W	200 W	When set to Double conversion mode		
Input leakage current	3 mA or less				
Ambient condition	Ambient temperature: 0 to 40°C, relative humidity: 20 to 90%				
Acoustic noise	40 dB or less		1 m front of UPS, A characteristics		

Note 1. When the AC input frequency is within the range of the rated frequency and the AC input voltage is within the rated voltage range, the inverter synchronizes with the AC input frequency and no-break transfer is possible.

Note 2. During Double conversion mode. It depends on the commercial power supply during Economy mode or Active Filter mode.

5. Conclusion

As information communication technology becomes more sophisticated, its social importance will continue to grow. In addition, the requirements for the UPS will diversify as it is used in various environments.

We will continue to quickly develop products to meet these market demands and provide devices that fulfill our customers' needs.

We sincerely thank the many people involved in the development and realization of this device for their advice and support.



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