



Defend 400 (NV400) User Manual



Contents

1. INTENDED PURPOSE	3
2. LABELLING SYMBOLS	3
3. CLASSIFICATION OF EQUIPMENT	5
4. WARNINGS AND CAUTIONS	5
5. SAFETY FEATURES	6
6. TECHNICAL SPECIFICATIONS.....	7
7. INSTRUCTIONS FOR USE	8
7.1 MOVING THE DEFEND 400.....	8
7.2 POWERING ON THE DEFEND 400.....	9
7.3 CONTROL INTERFACE.....	10
8. SERVICE AND MAINTENANCE INSTRUCTIONS.....	11
8.1 SERVICE.....	11
8.2 FILTER REPLACEMENT	11
8.3 FILTER DISPOSAL.....	14
8.4 CLEANING.....	14
9. TROUBLESHOOTING	15
10. ELECTROMAGNETIC COMPATIBILITY	15

1. Intended Purpose

The Novaerus Defend 400 (NV400) is intended as a room recirculating air cleaner. The system is used for filtering out and inactivating airborne particles from the air for medical purposes.

The Novaerus Defend 400 can be used in indoor environments of all sizes (e.g. medical, commercial, hospitality, education, retail, offices, residential, etc.) to improve the quality of air.

The Novaerus Defend 400 Air Purifier device can be operated by any person following instructions of this manual.

Please read and follow all instructions in this manual.

2. Labelling Symbols

Symbol	Meaning
	Caution
	Consult instructions for use
	Caution, dangerous voltage
	Warning, dangerous voltage
	Date of Manufacture
	Manufacturer
	Serial Number
	Mains Power Switch On (Power)
	Mains Power Switch Off (Power)

	Indicates the temperature limits to which the device can be safely exposed.
	Indicates the range of humidity to which the device can be safely exposed.
	This product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.
	This product conforms to the requirements of the applicable European Economic Community directives for product safety

3. Classification of Equipment

Item	Classification
Ingress Protection	IPXX keep dry
Mode of Operation	Continuous

4. Warnings and Cautions

 General Warnings and Cautions
WARNING: This equipment contains high voltage.
WARNING: This High Voltage (HV) device is not suitable for use within atmospheres that contain potentially combustible or explosive dusts, vapours, or gases (including oxygen-rich environments, e.g. oxygen tents, hyperbaric chambers).
WARNING: Do not use outdoors or near water.
WARNING: This device should not be exposed to environmental sterilization processes such as fogging or misting. Both the water vapour and chemical agents may cause damage to internal components, thus invalidating the warranty. The active carbon filter may also absorb the chemical vapour, thereby minimizing the sterilization effects in the environment, whilst also reducing the operating life of the filter
WARNING: To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.
WARNING: To reduce the risk of electric shock, this equipment has a grounding type plug that has a third (grounding) pin. This plug will only fit into a grounding type power outlet. If the plug does not fit into the outlet, contact qualified personnel to install the proper outlet. Do not alter the plug in any way.
WARNING: If the power cord is damaged in any way, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.
WARNING: This equipment should be inspected frequently and collected dust removed from it regularly to prevent excessive accumulation that may result in flashover or a risk of fire.
WARNING: No modification of this equipment is allowed.

WARNING: Do not open the tamper proof screws on the casing of the device. No serviceable parts are contained within. The devices should be opened by authorised Novaerus personnel only.
WARNING: For continued protection against risk of fire, only replace the fuse with the same type and rating, provided in Section 6, Technical Specifications.
CAUTION: Do not use other filters except those supplied by Novaerus. The use of other brand or no-brand filters with the Defend 400 (NV400) will invalidate the claims that can be made for the performance of the Defend 400 (NV400). Novaerus also reserves the right in such situations to refuse warranty claims.
CAUTION: The device is not meant to be lifted by the handle; wheels are provided for mobility. While moving the device, lift the power cord off the ground and away from the wheels. Failure to do so may result in the power cord impeding the wheels from moving, instability, or damage.
CAUTION: Carefully remove all packaging and shipping tape before use.
CAUTION: Do not restrict the air flow of the product in any way. Make sure the inlet and outlet are clear of any objects which may restrict airflow.
CAUTION: Do not position the equipment where it is difficult to operate the power switch.
CAUTION: Not to be used by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction. Children should be supervised to ensure that they do not play with this device.

5. Safety Features

The Defend 400 (NV400) incorporates the following safety features :

- Safety interlock switch which will not allow the device to operate if the rear door is not properly closed.
- Safety interlock switches which will not allow the device to operate if the filters are not properly inserted.

6. Technical Specifications

Model		Defend 400 (220-240VAC)
Power Supply	Nominal Volatage: Input Voltage Rane: Input Frequency Range: Power Consumption:	230 VAC 220 – 240 VAC 50/60 Hz 24W - 200W
Airflow	Speed 1: Speed 2: Speed 3: Speed 4: Speed 5:	80 m ³ /h (47 CFM) 120 m ³ /h (71 CFM) 225 m ³ /h (132 CFM) 335 m ³ /h (197 CFM) 380 m ³ /h (224 CFM)
Area Coverage		39m ² 420 ft ² (4 ACH) 79 m ² 850 ft ² (2 ACH)
Volume Treated [†]		96 m ³ 3,390 ft ³ (4 ACH) 192 m ³ 6,780 ft ³ (2 ACH)
Fuse		Dual 4 A, 250 VAC, Anti-Surge, 5 × 20 mm
Dimensions		380 mm (w) × 380 mm (d) × 855 mm (h) 15.0" (w) × 15.0" (d) × 33.7" (h)
Weight [‡]		Approx. 25.7 kg 56.7 lbs
Filters	Stage 1 Pre Filter: Stage 2 HEPA Filter: Stage 3 Carbon Filter:	M5 EN 779, ePM10 65% ISO 16890 H13 EN 1822 G4 EN 779, Coarse 65% ISO 16890
Noise [§]	Speed 1: Speed 2: Speed 3: Speed 4: Speed 5:	41 dBA 47 dBA 56 dBA 62 dBA 65 dBA
Operating Conditions	Temperature: Relative Temperature:	10 - 35 °C 50 - 95 °F 10 - 75 %
Storage/ Shipping Conditions	Temperature: Relative Temperature:	5 - 50 °C 41 - 122 °F Max 95 %
Mounting Type:		Floor standing
Portability		Movable (2-wheeled base & handle)
Construction & Colour		Grey moulded plastics, white aluminum composite, and precision-cut stainless steel with anti-microbial powder coat finishes..
Quality & Safety	Manufactured Under:	Manufactured under ISO 9001
	Certifications:	 (IEC60335 - Low Voltage Directive)
	For full list of certifications visit:	www.novaerus.com
Expected Service Life		5 years

* ACH = Air changes per hour

† Room with 2.44 m (8 ft) high ceiling

‡ Weight includes filters

§ Measured 1m from device

7. Instructions for Use

7.1 Moving the Defend 400

Position yourself close to the back of the device holding the handle firmly with both hands. Pull the handle slowly towards your body while stepping back onto your other foot as illustrated in Figure 1 below.

Stabilize the Defend 400 at a comfortable angle, depending on your individual height, where minimal pressure is exerted against your body to ensure stability and either push or pull it to a desired location.



Care should be taken when moving the Defend 400 to a desired location. Take extra care when moving the device up or down steps or over humps. Always lower the device down carefully, never letting it drop under its own weight.



Figure 1 – Moving the Defend 400

Once you have reached your destination, allow the device to gently return to the upright position by placing one foot against the base and gently extending your forearms allowing the device to return to the front legs to stabilize the device.

The Defend 400 should be placed in a dry location and connected to a suitable grounded outlet. The product is intended to be used as a floor standing unit only. When selecting a location for the device, allow for enough space around the sides and front to ensure free airflow.

Once the device is installed at the desired location it can be powered ON.

7.2 Powering on the Defend 400



Before turning ON the device, ensure that the power supply matches the device's rated power supply as marked on the product label above the power inlet.

The Defend 400 is powered using mains power supply as described in Section 6, Technical Specifications. The device should be connected to the electric outlet using the power cable provided. Ensure the cable is properly connected to the mains power socket and to the device's power inlet which can be found near the wheels on the rear side of the device. Once the cable has been connected, turn ON the mains power switch followed by the device's power switch which is located beside the power inlet. Once powered, the device's display will turn ON and show the control interface, which is described in Section 7.3 below.



Ensure all packaging is removed from the device and from the filters before powering ON the device.



Ensure all filters are secure in place and the door closed shut before powering ON the device.



Figure 2 - Location of power inlet

Your power cable may have a built-in mechanical retaining system to prevent unexpected disconnections. To release the cable from the device, press down on the small button located on the connector housing (shown in figure 3 below) while simultaneously pulling outward.



Figure 3

7.3 Control Interface

The Defend 400 can be controlled using touch screen interface on the top of the device. Figure 3 below provides a labelled layout of the interface along with a description of each of the elements below that.



Figure 4: Defend 400 Control Interface.

1. Power button.
2. Power state indicator.
3. Reduce airflow speed button.
4. Airflow speed indicator.
5. Increase airflow speed button.
6. Indicator for save speed setting.
7. Save/clear saved speed button.

7.3.1 Power Control

The device can be switched ON and OFF using the power button [1] on the left-hand side of the control interface. The power state indicator [2] will be illuminated blue when the device is powered ON and grey when powered OFF.

7.3.2 Airflow Control

The airflow of the device can be controlled using the increase airflow button [5] on the right-hand side, and the reduce airflow button [3] on the left-hand side. The current airflow setting is indicated in the centre by the airflow speed indicator [4], as series of 5 dots which light up from left to right as airflow speed is increased.

7.3.3 Save Airflow to Memory

The current speed setting can be saved to memory using the save speed button [7]. In the case of a power failure, the device will power back ON directly to the saved speed. The blue indicator on the save speed button [6] will be illuminated when a speed is saved. To clear a saved speed, use the clear saved speed button [7]. The indicator for saved speed will turn off when the saved speed is cleared.

7.3.4 Display Sleep Mode

To prevent disturbances and save power, the control display will go into sleep mode after one minute of inactivity. The display can be woken up by touching the display.

8. Service and Maintenance Instructions

8.1 Service

No serviceable parts are contained within the Defend 400 device. The devices should be opened by qualified Novaerus personnel only. It is designed with tamper-proof screws to ensure that it cannot be easily opened by anyone other than service personnel.

8.2 Filter Replacement



Before replacing filters ensure the power is switched off at the rear mains switch.



Ensure all filters are secure in place and the door closed shut before switching the device back on via the rear mains switch.



Only original Novaerus branded filters should be used. Using non-certified filters could affect the safety and performance of the Defend 400 and should not be used under any circumstances.



Figure 5 - Defend 400 Filters: [1] Pre-Filter, [2] HEPA Filter, [3] Carbon Filter

The filters of the Defend 400 can be accessed by opening the rear door as shown in Figure 4 above. For safety reasons, the device will not function if the door is not closed properly or if any of the filters are not inserted properly.

8.2.1 Pre-filter

The intake Pre-Filter is located at the very bottom of the device. It is labelled Filter 1, and coloured aqua blue (see Figure 4).

This filter should be inspected monthly and should be replaced when dirty. It is recommended to replace this filter after three (3) months of continuous use.

It is recommended that the user inspect the intake Pre-Filter monthly during the first 2 months of use to determine the most appropriate cleaning period. If enough dust and debris has collected on the filter to cause significant decrease in airflow, more frequent replacement of this filter may be required.

The Pre-Filter can be removed by simply pulling outward on the filter's frame and replacing it with a new filter. Ensure that the filter's label is outward facing and oriented correctly with the arrows pointed upward. Ensure that the filter is pushed all the way in.

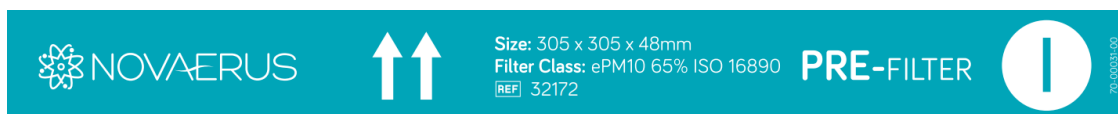


Figure 6 – Pre-Filter Label

8.2.2 HEPA Filter

The HEPA Filter is located above the core of the device just below the Carbon Filter. It is labelled Filter 2 and coloured orange (see Figure 4).

The HEPA Filter should be replaced after twelve (12) months of continuous use. Discolouration on the filter may indicate that it has exceeded its life expectancy. The expected lifetime of these filters is approximately twelve months (12) under normal clean air conditions (such as that of a hospital ward).

To remove the HEPA Filter, first release the Filter Lock by pulling it upward. Next, remove the Carbon. Finally, the HEPA Filter can be removed. The HEPA Filter has a handle which can be used to pull the filter out of the device. When inserting a filter, ensure the filter's label is facing outward and oriented correctly with the arrows pointed upward. Ensure that the filter is pushed all the way in.

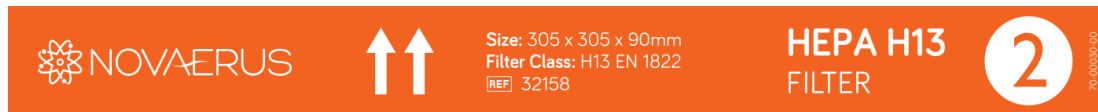


Figure 7 - HEPA Filter Label

8.2.3 Carbon Filter

The Carbon Filter is located above the HEPA Filter. It is labelled Filter 3 and coloured charcoal (see Figure 4).

The Carbon Filter should be replaced after four (4) months of continuous use. The expected lifetime of these filters is approximately four (4) months under normal clean air conditions (such as that of a hospital ward).

To remove the Carbon Filter, first release the Filter Lock by pulling it upward. The Carbon Filter will then be free to be removed. The Carbon Filter has a handle which can be used to pull the filter out of the device. When inserting a filter, ensure the filter's label is facing outward and oriented correctly with the arrows pointed upward. Ensure that the filter is pushed all the way in.

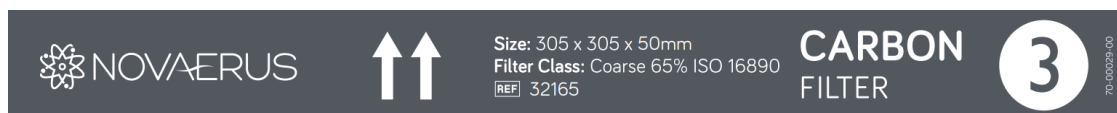


Figure 8 - Carbon Filter Label

8.3 Filter Disposal



The following instructions are for filter disposal for filters used in non-hazardous environments.

Filter	Disposal
Pre-Filter	Throw-away, dry type air filter
HEPA Filter	Throw-away, dry type air filter
Carbon Filter	Throw-away, dry type air filter

Follow the below instructions to properly dispose of a used non-hazardous air filter:

1. Before you begin, have a plastic bag available.
2. Turn off the Defend 400.
3. Carefully remove the used air filter from the Defend 400.
4. Place the filter gently into the bag, without shaking it. This will prevent the filter from releasing dust and particles into the air.
5. Tie or tape the bag shut
6. Take the bagged air filter and place it in the correct waste disposal stream



For filters used in environmentally hazardous and/or biomedical hazardous air streams, follow the occupational safety and health administration guidelines in the country of origin.

8.4 Cleaning

The Defend 400 should be visually inspected on a monthly basis for accumulation of dust on the vent grills that are located at the top and bottom. It is recommended that the device be cleaned using a vacuum cleaning brush from the outside to remove any dust that may have accumulated on the grills.

Clean the body of the Defend 400 regularly to prevent dust from collecting.

1. Wipe away dust from the body of the device with a soft dry cloth.
2. Clean the air outlet with a soft dry cloth.

9. Troubleshooting

If you are experiencing a problem with your device, please check the following points:

Symptom	Solution
No power to the device.	1. Check that there is power at the electric outlet. 2. Check that the power cable is properly connected to the device. 3. Check that the power switch located besides the power inlet is switched ON. 4. Check that no fuses have blown.
The display is ON and front LED ring is ON but fan does not turn ON.	1. Check that the on-screen power button is turned ON. 2. Check that all three filters have been properly inserted. 3. Check that the filter lock is down. 4. Check that the door is closed properly

If none of the above solutions restore normal operation, contact a representative of the Novaerus technical team for assistance.



Should the device sustain severe damage and/or an increase in noise from the internal parts is observed, discontinue use, and contact a representative of the Novaerus technical team for assistance. This product is not intended to be repaired in the field.



Do not attempt to repair the device yourself since this may cause injury and/or void the warranty.

10. Electromagnetic Compatibility

The Defend 400 (NV400) has been tested for Electromagnetic Compatibility to IEC 60601-1-2 for home use requirements (which is the highest standard for device EMC testing). This includes testing that it does not interfere with and is not affected by common household RF emitters (WLAN, Wireless telephone handsets and mobile telephones) that are more than 2m (6 feet) away from the Defend 400 (NV400). If there is any sign of mutual interference between the Defend 400 (NV400) and a Radio Frequency device, move them to be at least 2m (6 feet) apart to reduce the likelihood of interference..