

4.4.AC Electrical Line Connection



Prior to energizing the transmitter, one must make sure that the circuit breaker and the power switch (ON / OFF) are switched off or disabled.

4.4.1. Electrical line connection (EC701HP-BB3)

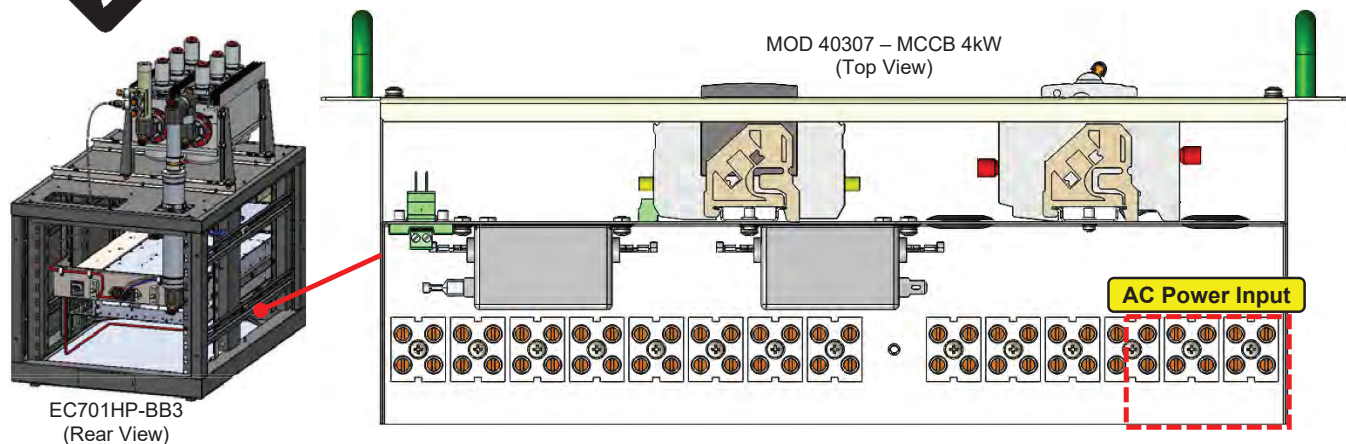
The Electrical Line is connected to the AC Unit MOD 40307 – MCCB 4kW:



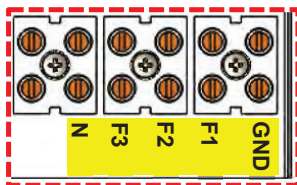
Before Connecting the transmitter to the AC Mains, one must ensure that the grid Voltage meets the equipment's settings. Any questions, please refer to Section 3 item 6.7. "AC Mains Protection Unit" of this manual.



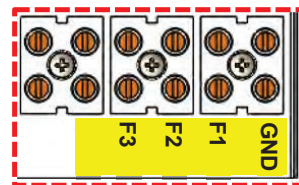
Connection modes according to the Grid Voltage:



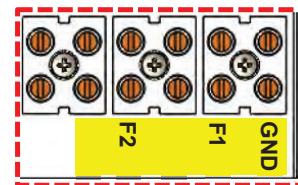
T380
3-PAHSE (220V) +
NEUTRAL + GND



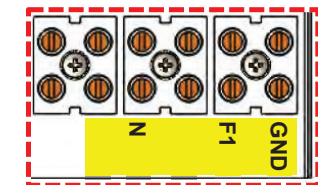
T208
3-PAHSE (110V) +
GND



B220
2-PAHSE (110V) +
GND



M220
1-PAHSE (220V) +
NEUTRAL + GND



Legend

F1	Phase Input (R)
F2	Phase Input (S)
F3	Phase Input (T)
N	Neutral



Never invert Neutral with Phase.



The screws must be properly tightened in order to avoid sparks.

4.4.2. Electrical line connection (EC702HP-BB3, EC703HP-BB3, EC704HP-BB3)



Prior to energizing the transmitter, one must make sure that the circuit breaker and the power switch (ON / OFF) are switched off or disabled.

4.4.3. Electrical line connection (EC701HP-BB3)

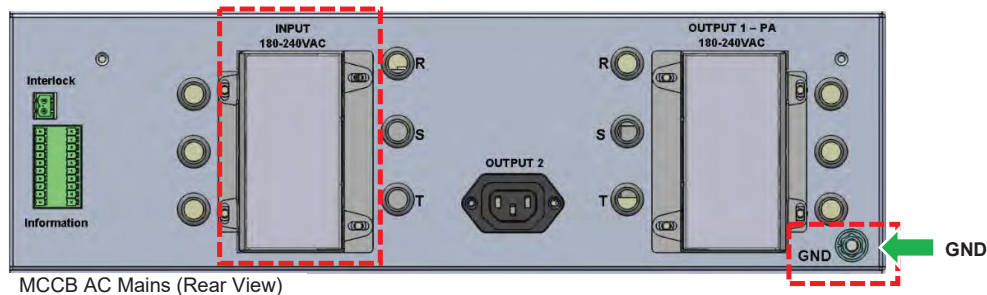
The Electrical Line is connected to the MCCB Unit rear.



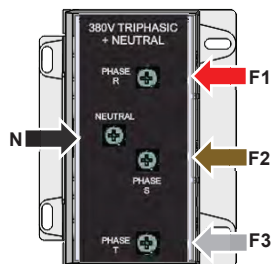
Before Connecting the Machine to the AC Mains, one must ensure that the grid Voltage meets the equipment's settings. Any questions, please refer to Section 3 item 6.7. "AC Mains Protection Unit" of this manual.



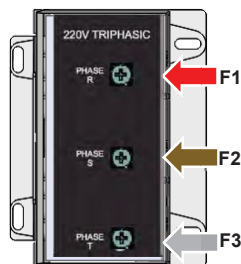
Connection modes according to the Grid Voltage:



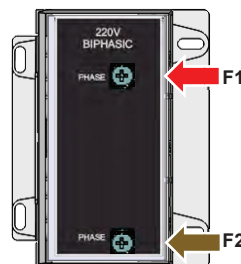
T380
3-PHASE (220V) +
NEUTRAL + GND



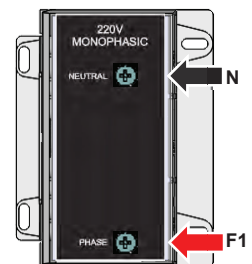
T220
3-PHASE (127V) +
GND



B220
2-PHASE (110V) +
GND



M220
1-PHASE (220V) +
NEUTRAL + GND



Legend

F1	Phase Input (R)
F2	Phase Input (S)
F3	Phase Input (T)
N	Neutral
GND	Ground



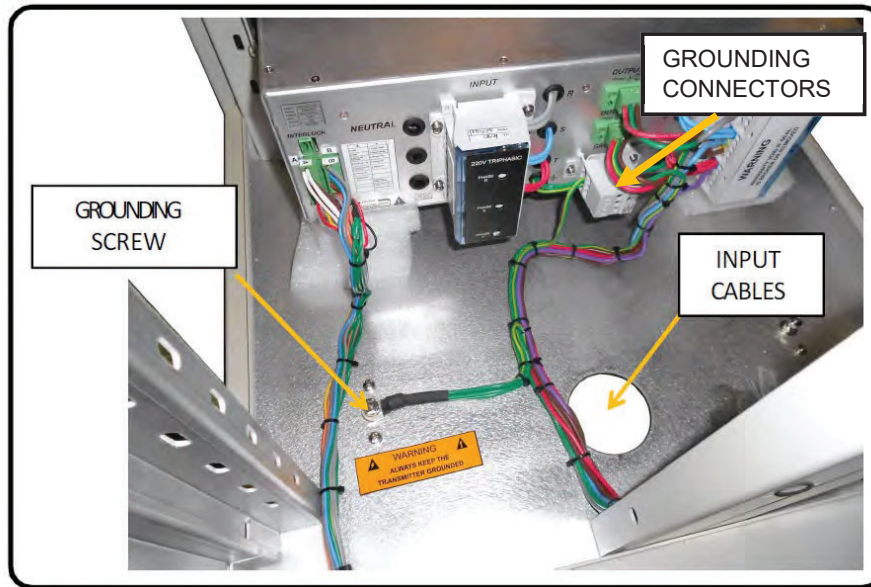
Never invert Neutral with Phase.



The screws must be properly tightened in order to avoid sparks.

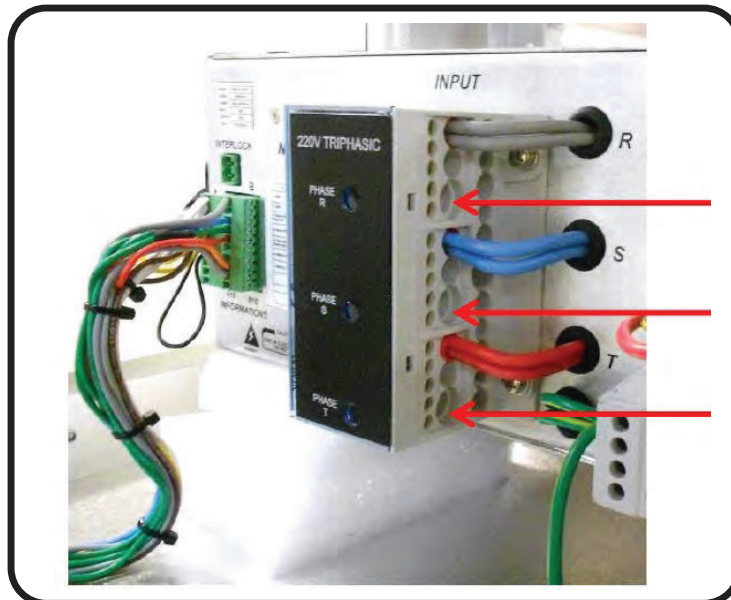
The Electrical Line is connected to the MCCB Drawer.

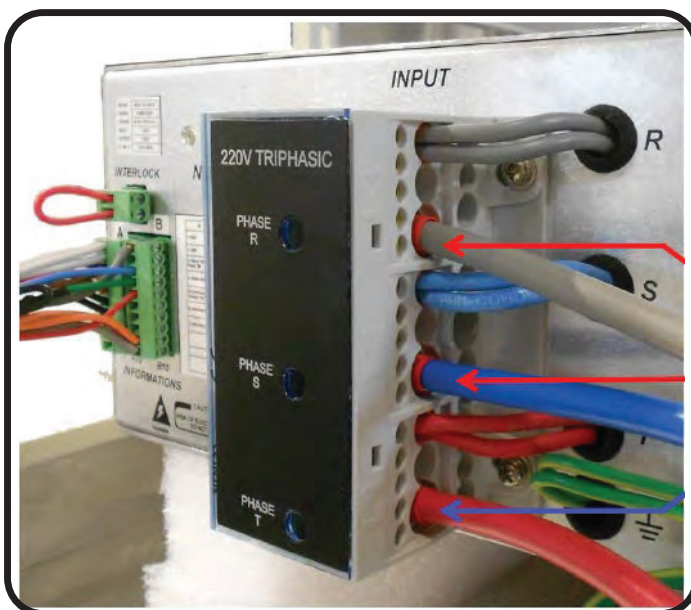
The rack bottom features an inlet for the AC and GND cables:



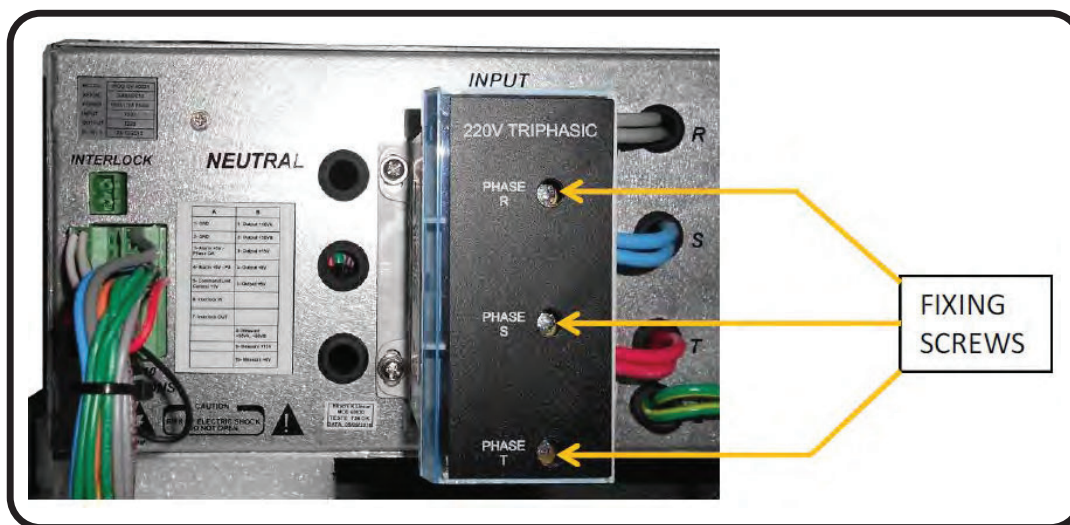
Connect the grounding cable to the grounding screw shown in the picture above. The other power cables plug into the MCCB.

Insert the cables (phases or phases-neutral; see AC mains) into the respective holes of the INPUT connector. Observe the Identification label on the INPUT connector:





Fix the Screws:



The screws must be properly tightened in order to avoid sparks.



See MCCB AC mains Type on Section 3 – E-Compact High Power Series UHF Digital Transmitters – Item 5. 4.1.2

Section 5 – Initial Activation

1. Overview

After finishing the installation, the equipment is ready to be activated. It is important to observe that the transmitter is configured at the factory with the parameters that were supplied by the customer at the time he made the purchase, such as the channel output, power, MER, etc.

One should check the functionality and performance of the RF power, DC currents, temperature, alarms and communication.



Never turn on the equipment without connecting it to an Antenna or RF Load, as this may cause serious damage to the Equipment.



You must ensure that the general circuit breaker is off. Then, ensure that the all POWER ON / OFF settings are set to the OFF position in all Drawers.



Make sure that the Channel is configured and the Exciter is the same as the Mask Filter and the antenna.



Check if the Antenna VSWR for the operating channel is better than -23dB of Return Loss.



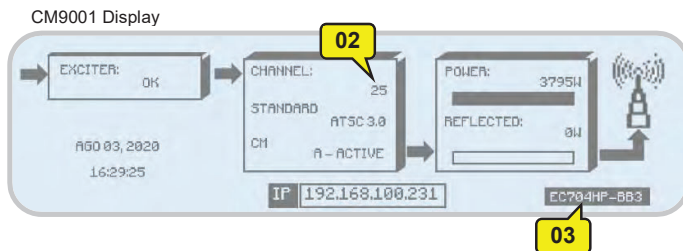
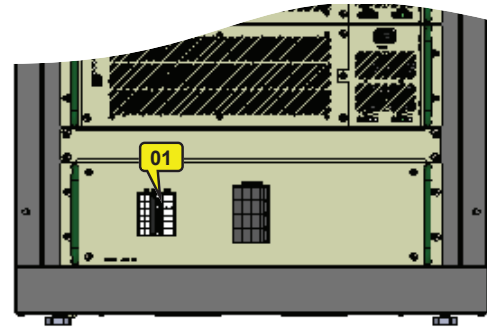
Using a voltmeter, check that the AC Mains of the equipment is within its characteristics.

2. Activation



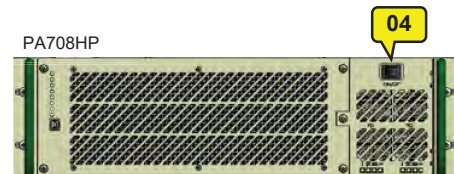
The steps of this activation must be followed to avoid damage to the equipment.

1 st	Before Turn-On, Check if all on/off key Drawers is " off "
2 nd	Trigger the circuit breaker on (01)
3 rd	Power On (Rear Panel) The Exciters and the CM8001 Module Control



4 th	Check if both the Exciter (Main and Backup) are configured for the correct channel, the same as the Mask Filter and the Antenna
5 th	Check if both the Module Control CM9001 (Main and Backup): Channel is the same of the Exciter (02) The description of the Equipment is correct (03)
6 th	Check if the Main Exciter and Main Module Control CM8001 are active.
7 th	Check if the Programmed Power in Main Module Control CM9001 is 0 (ZERO) Watts: Display Interface >Measurements > Power > Programmed Power [1/3]

8 th	In the Power Amplifier Drawer 1 Switch On the Power Supply (04)
9 th	Check the Drawer Communication Status. In the Main Module Control Display Interface: >Measurements [2000] > Communications Status [2500] Pxx = OK
10 th	Check the ALL Power Supply and Current when 0 (Zero) Watts Transmitter FWD Power: In the Main Module Control Display Interface: >Measurements > Drawers > Power Supply Power Supply ≈ 45.5V >Measurements > Drawers > Current I ≈ 0.30A (for each PA)
11 th	Repeat steps 8 th , 9 th and 10 th for the other Power Amplifiers Drawers. Following your numeral order.



12 th	Set the Programmed Power in Main Module Control CM9001 to 10% of the total power of the equipment Display Interface >Measurements > Power > Programmed Power
13 th	Check: - Alarms Occurrences: >System Alarms/Log > Current Alarms No alarms - Reflected Power: >Measurements > Power > Reflected The REF power must be less than 2% of FWD Power. - Check the ALL Power Supplies, Current and Temperature in the Power Amplifiers Drawers >Measurements > Drawers] > Power Supply Power Supply ≈ 50,0V (all) >Measurements > Drawers > Current All must be of the same current value >Measurements > Drawers > Temperature Below 131°F (55 °C)
14 th	Set the Programmed Power in Main Module Control CM9001 to 25% of the total power of the equipment. Display Interface >Measurements > Power > Programmed Power Repeat the check from 13th step.
15 th	Set the Programmed Power in Main Module Control CM9001 to 50% of the total power of the equipment. Display Interface >Measurements > Power > Programmed Power Repeat the check from 13th step.
16 th	Set the Programmed Power in Main Module Control CM9001 to 75% of the total power of the equipment. Display Interface >Measurements > Power > Programmed Power Repeat the check from 14th step.
17 th	Set the Programmed Power in Main Module Control CM9001 to 100% of the total power of the equipment. Display Interface >Measurements > Power > Programmed Power Repeat the check from 13th step.



If there is an alarm during the power startup, it is advisable to zero the output power of the transmitter to determine the solution and then contact Comark's customer support.



Check if there is any abnormal or differential heating in the connection joints between the transmitter, filter, antenna, and adder's imbalance load. If there is any abnormal warming in an isolated way, this may indicate some flaw or imperfection in that connection. This must be checked before further increasing the transmitter's power.



When operating under normal conditions, the modules located at the transmitter's rear may reach up to 55°C. This is due to the fan speed control, which is responsible for keeping the transistor's temperature at 60°C, as well as the presence of aluminum heatsinks and high thermal dissipation pallets. All passive devices are located at the rear panel and operate within the temperature ranges recommended by the manufacturer.

3. Main Operations

3.1. Power Changing

The alteration of the transmitter power is something possible and accessible to the customer through the screen POWER SETUP by software navigation Menu in the digital display
See: Item in Control Module – System Structure

3.2. Communication

Ethernet Communication:

This equipment has a Web Page server accessed by the Ethernet port located on the front panel of the Module Control CM9001. Once the Control Module is connected to the Switch, this graphical interface can be accessed by connecting to one of the Switch ports.

USB Communication:

The communication of the digital exciter via USB port, is only possible with the use of the software GUI8001 (optional).

4. Forbidden operations

There are transmitter parameters which are configured at the factory, parameters defined on the purchase of the transmitter. There are parameters that are set at the factory - and as previously noted, were provided at the purchase – which cannot then be changed.

- Channel
- Equipment Model

There are other parameters that are configured in the factory but might be reconfigured using a password. The careful use of the password is to prevent unauthorized access that can cause the appearance of a reflected power at the transmitter and consecutively decreasing the value of the output power of the transmitter due to the protective action of the same.

5. Protections

5.1. Reflected Power

If the incidence of reflected power at the transmitter due to any external or internal factor occurs, refer to the measurement screen (MEASUREMENTS) by browsing the software's navigation Menu, according to instructions given in the Operation Section of the Digital Control System.

If the value of the reflected power exceeds the value of 2% of rated power, the control immediately signals through the Current Alarm LED and this triggers the routine protection against reflected power. This gradually decreases the value of the forward power until the amount of power reflected returns to less than 2% of rated output. At this time, the software returns to gradually increase the value of forward power, foreseeing the possible absence of the reflected power. Thus, the equipment will be oscillating between increase and decrease of the direct power around the power value that provides a reflected power of 2% of rated power, always seeking the return to the rated power of equipment.

The 2% value to generate the reflected power alarm is fixed, ie. the alarm always occurs when the reflected power is 2% of the nominal power of the EQP. Already the reflected value that makes the EQP reduce direct power to a configurable 2 to 5%. To change this value, go to Setup Menu-> Alarms Mask-> Reflected and change as needed.

5.2. Over-excitation

If an excessive increase in the value of the excitation signal level occurs, the control, through the ALC, interact with the exciter, to maintain a constant output power in it's rated value.

5.3. AC Mains Line Protection

Each piece of equipment has it's own independent power supply, all of which have equal protection features.

- Protection against short circuit
- Surge Protection

Basically, the surge protection on the network is performed by inserting the varistors between phases and between the phase and ground, thus absorbing peak voltage and not allowing it to damage the power supply. Protection against the short-circuit is carried out by monitoring the current in the output of the power supply. If the current exceeds a pre-set reference value, it will understand that the source output is shorted and should be disabled through the shutdown pin.

5.4. Transmitter Operating Temperature Configuration

The transmitter's operating temperature is measured on the power modules' transistors and is configurable between 50°C (122 °F) and 60°C (140 °F).

Configuration is done through the front panel Menu: Setup Menu "PA Temperature Control".

This configuration varies according to room temperature and the transmitter's efficiency and is necessary to optimize the operating temperature and equipment's lifespan.

This configuration shall be made when the equipment is activated following the procedure below:

1. With the transmitter running at operational power for at least 30 minutes, access the web or the PA USB interface to verify fan rotation.
2. Check fan rotation for all fans in all of the PA's.
3. Temperature adjustment must be done in order to obtain fan rotations between 5500 rpm and 6000 rpm.
4. If the highest rotation is below 5500 rpm, the temperature control has to be lowered. If it is above 6000 rpm, temperature control shall be raised.
5. Configure temperature at Setup Menu "PA Temperature Control". Lower or raise the temperature according to description in step 4 above. It is recommended that the procedure starts in steps of 4 °C.
6. Once configured, wait 5 minutes until transistor temperature stabilizes.
7. Repeat steps 3 through 6 until fan rotation is within range (5500 rpm to 6000 rpm).

Section 6 – Preventive Maintenance

1. Overview

This section is dedicated to the necessary procedures for proper preventive, periodic, and corrective maintenance in order to guarantee a TV transmitter that works properly and for a longer period of time.



Only trained and authorized people should be allowed to open the transmitter. The non-compliance of this item might result in the loss of warranty.

IMPORTANT:

- ⇒ The life expectancy of the equipment depends on its working conditions.
- ⇒ Environments with controlled temperatures increase the life span of the components.
- ⇒ In the semester inspections, if there is a noise or an abnormal vibration in the fan located inside the equipment, it should be replaced. This same procedure should be followed for the frontal panel fans in the power drawers or the exciter module.

2. Preventive Maintenance

2.1. Cleaning

Initial steps

- ⇒ Unplug the equipment from the power outlet.
- ⇒ Remove the side and top covers.
- ⇒ Disconnect all RF cables from the rear panel.

Procedure:

- (1) With an air blower, remove all the accumulated dust from the inside of the equipment, in the front and rear panels, sides, top, and bottom covers.
- (2) Clean the panels and the measurement instruments with a dry and soft cloth.
- (3) Remove the dust from the input of the air filters located in the bottom panel, side, and rear covers.



Do not allow any kind of particles or dust to get into the filter cavities.

- (4) If you can't use an air blower, use a brush with soft bristles to avoid scratching the equipment.
- (5) When you are done cleaning the equipment, put the side covers back in place, redo all RF and power connections, and turn the equipment on. Follow the activation procedure.

2.2. Visual Inspection

Remove the side covers.

- (1) Verify if all the connections in the modules, as well as the RF connections in the equipment and the irradiant system are correct.
- (2) Verify if rain water is coming through the RF cables or from the shelter's ceiling.
- (3) Verify all the air inputs and outputs of the equipment to make sure that they are not blocked.
- (4) When you finish the visual inspection, put the side covers back.

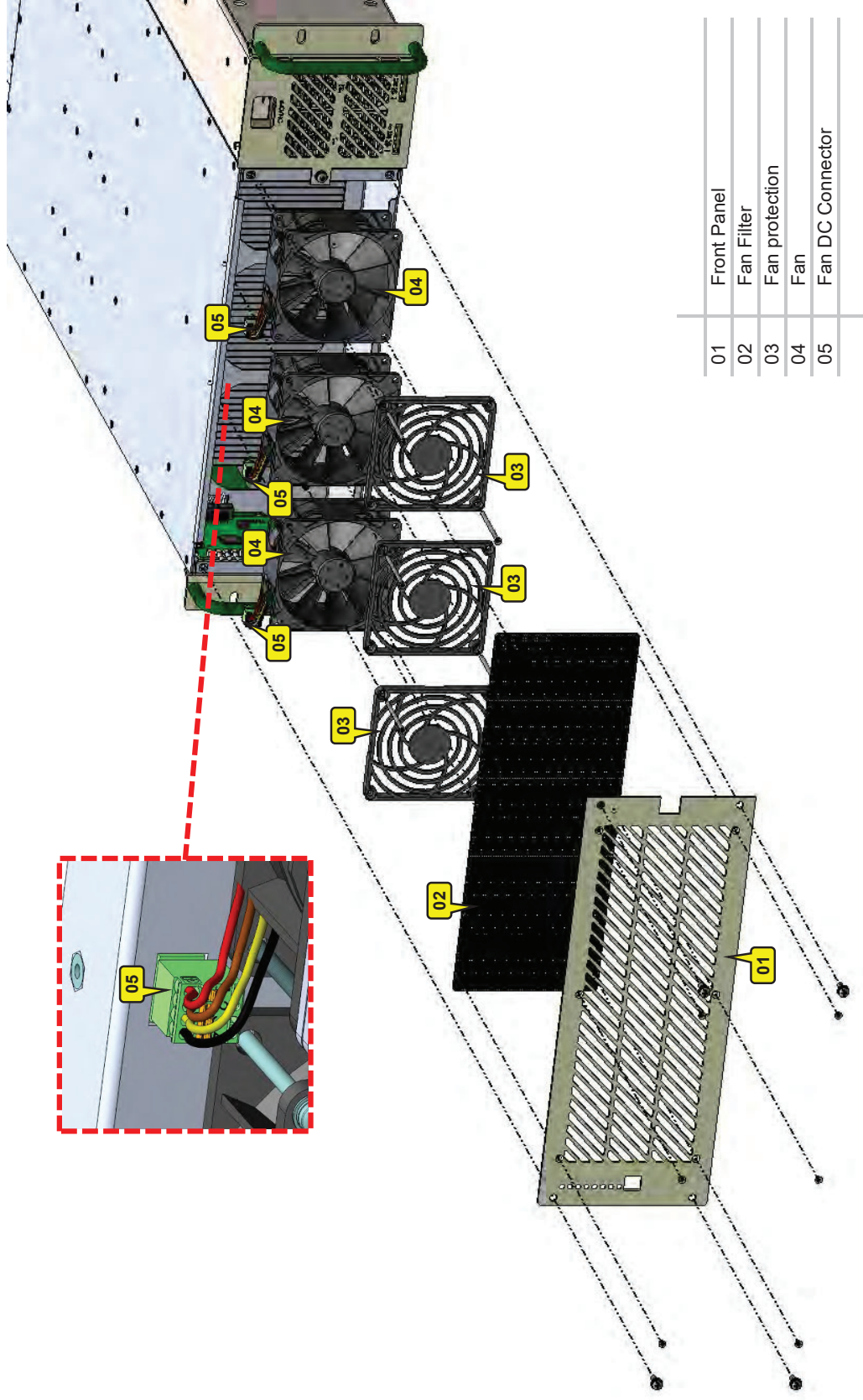
2.3. Reading Verification

Make all the possible measurements through the instruments and take notes of the results. Compare the obtained results with the quality control sheets, which come with the equipment. The monthly verification of these measurements helps to prevent any abnormality that may occur.

Section 7 - Attachments

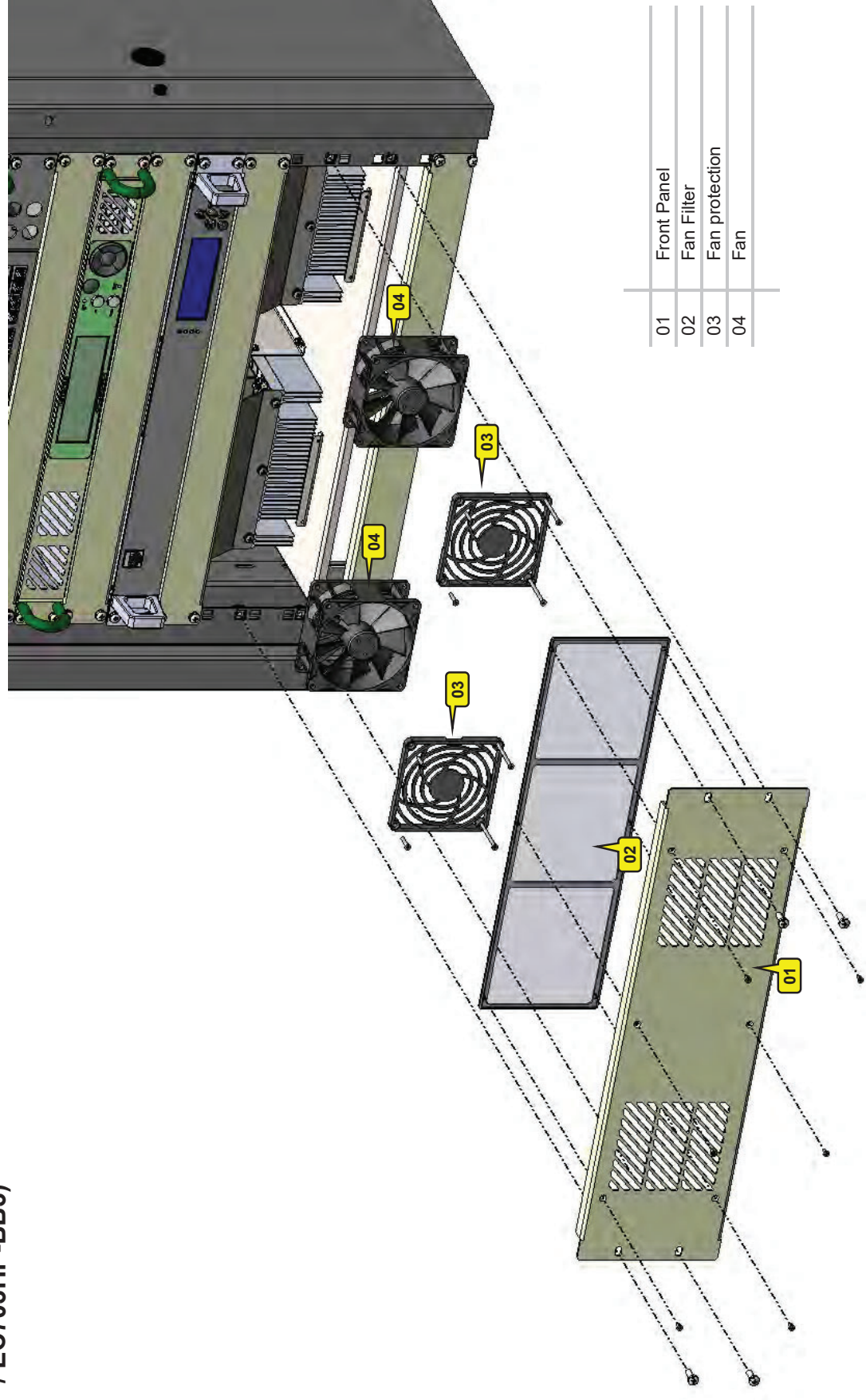


1. POWER AMPLIFIER DRAWER: Fan Filter Access for Cleaning / Fan Replacement



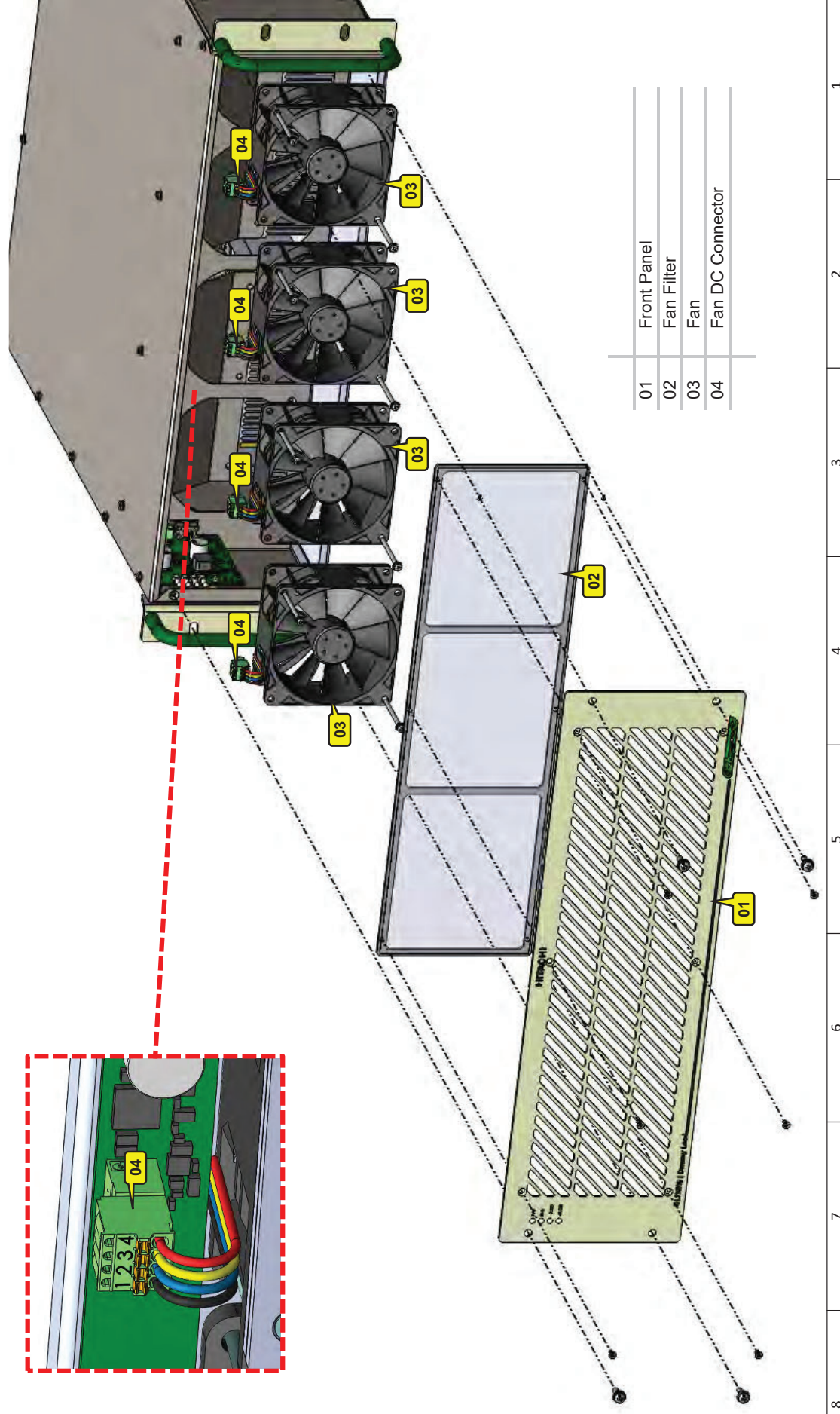
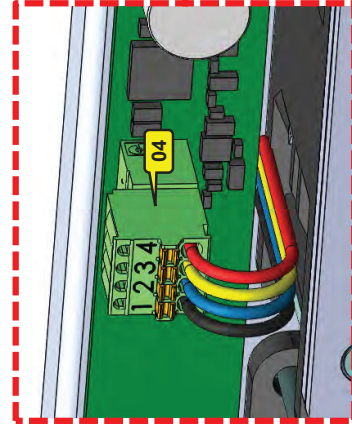


2. DUMMY LOAD DRAWER: Fan Filter Access for Cleaning / Fan Replacement (mod 40295/40311 – EC702HP-BB3 / EC703HP-BB3)



01	Front Panel
02	Fan Filter
03	Fan protection
04	Fan

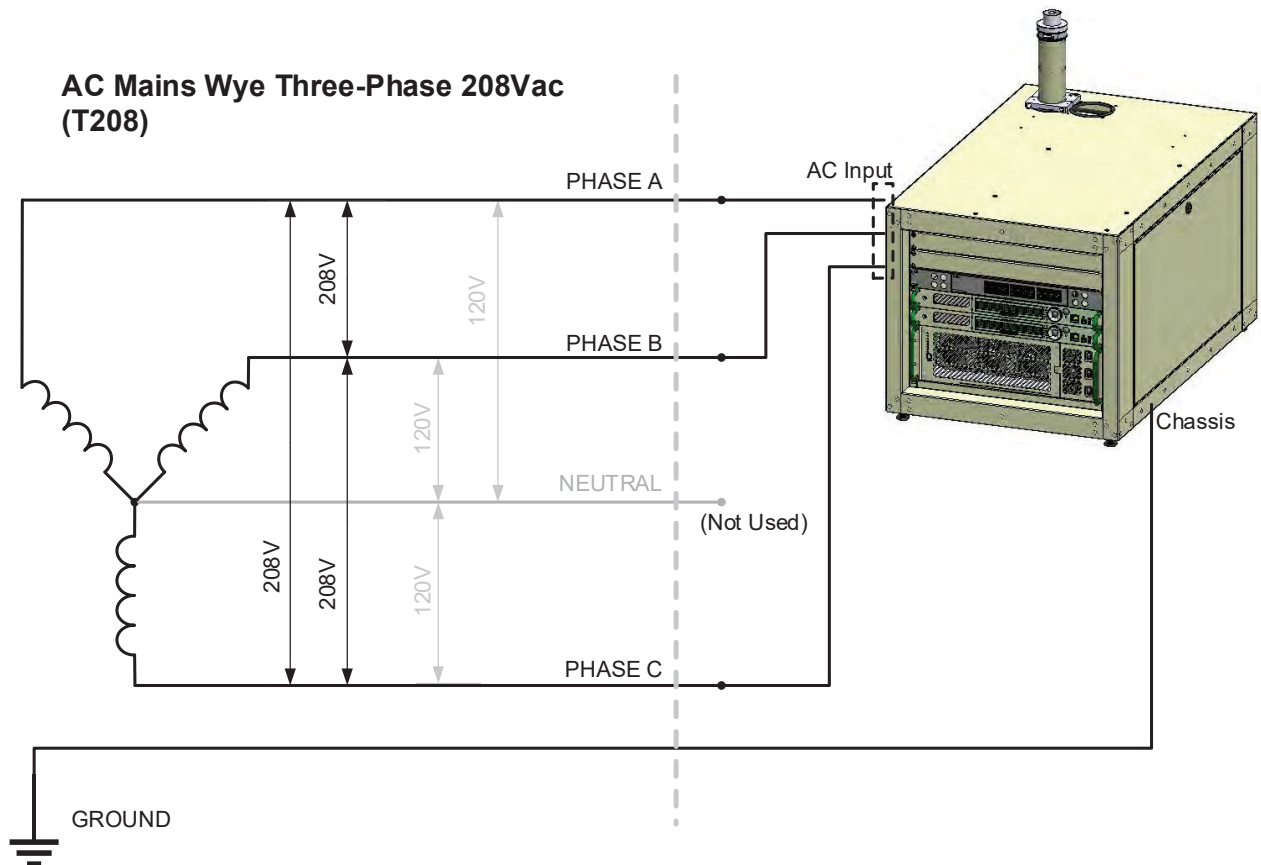
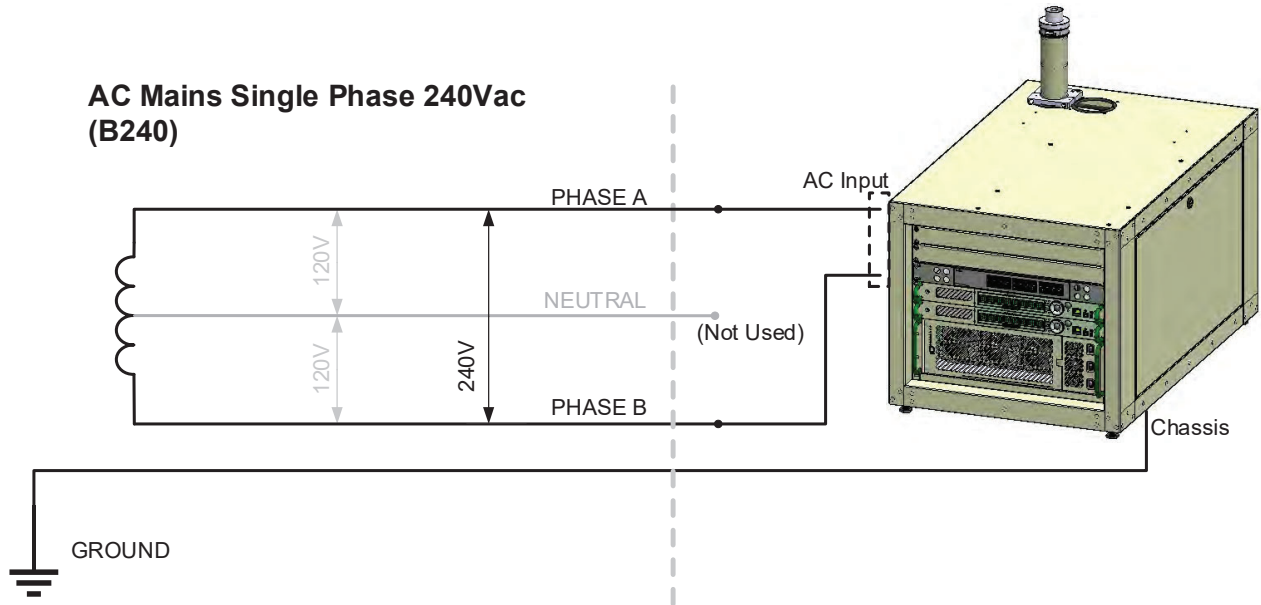
3. DUMMY LOAD DRAWER: Fan Filter Access for Cleaning / Fan Replacement (DL2K0 – EC704HP-BB3)



01	Front Panel
02	Fan Filter
03	Fan
04	Fan DC Connector

4. USA AC Mains Types for E-Compact Series

Common Electrical Services



Uncommon Electrical Services

