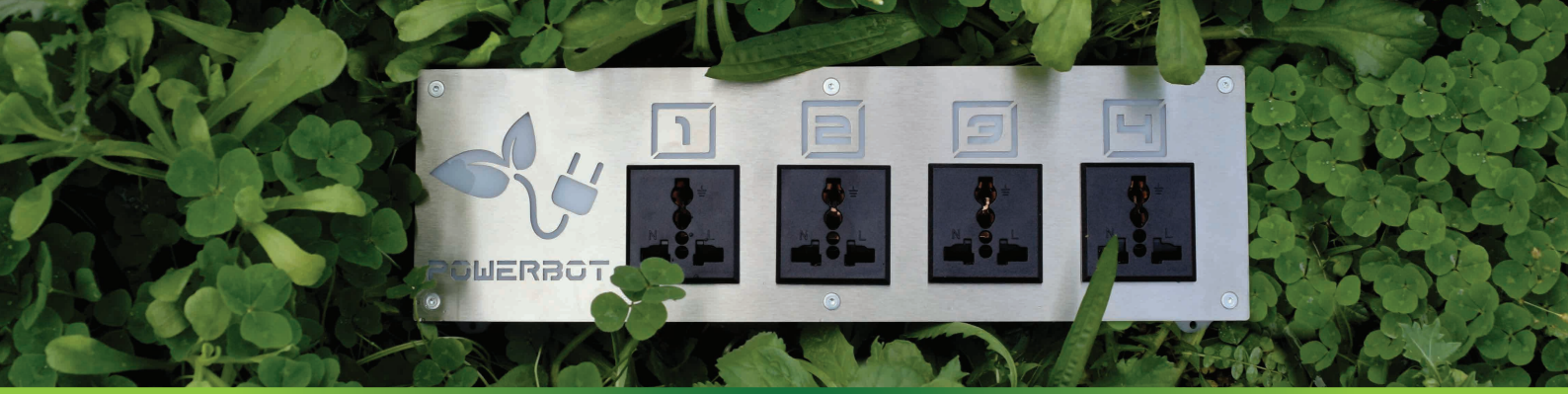


GROLAB POWERBOT

EAN 0604220146373

GroLab PowerBot is a complete power supply module from the GroLab family. It provides the tools to monitor, control, and automate all the basic elements of any agricultural grow, maximizing the plants' growth and overall efficiency.

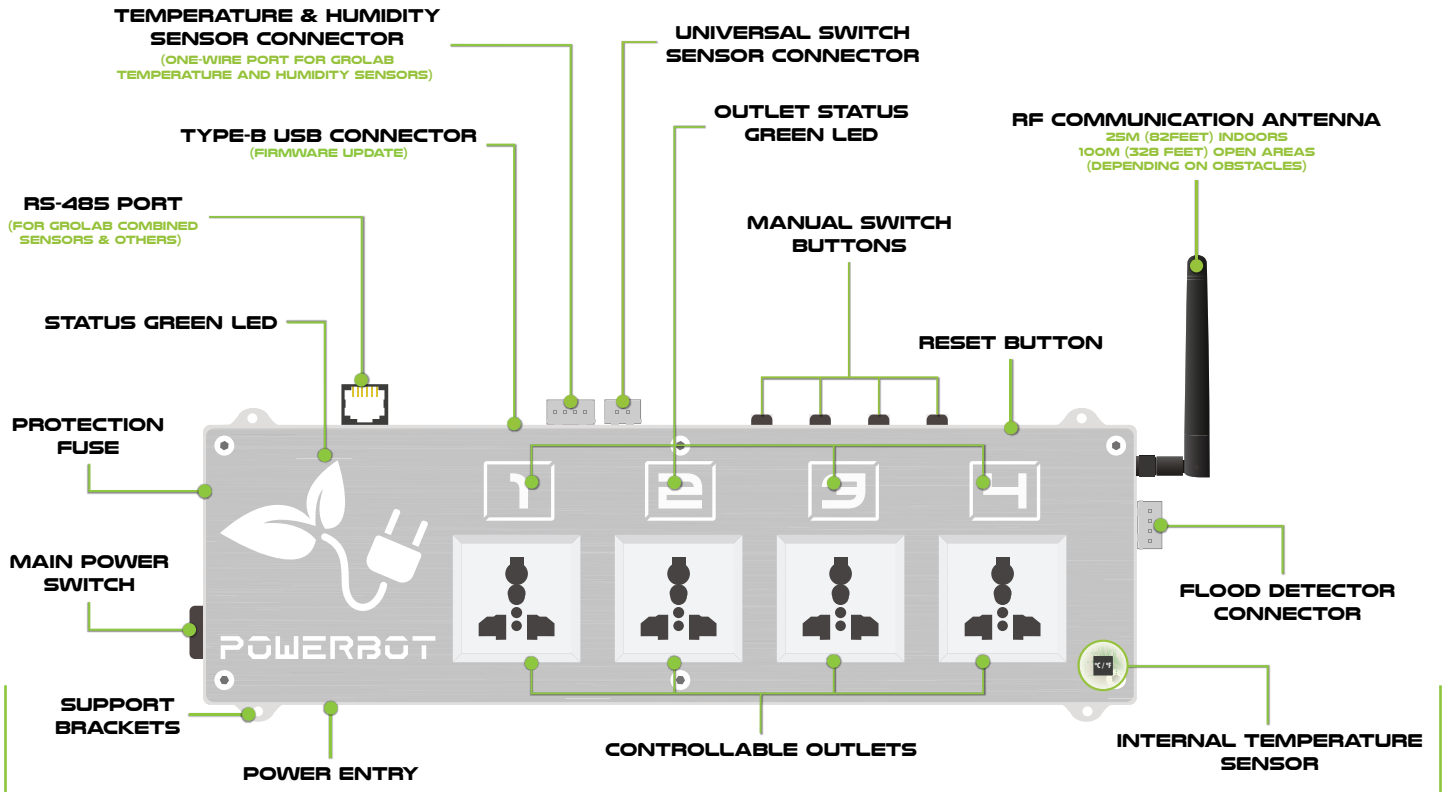
Equipped with a temperature and humidity sensor, which allows the PowerBot to keep the perfect climate conditions for the plants, at the same time GroLab makes it simple to customize the desired temperature and humidity values.

The PowerBot has four universal plugs that support per plug and in total up to 1200W (US version) and 2300W (other versions) or unlimited power when using an external electrical contactor. Lighting and ventilation systems, water pumps, humidifiers, heaters, and CO_2 dispensers are some examples of peripherals that PowerBot can automate.

In addition, it supports one flood detector, one universal switch sensor (e.g. motion/smoke detector), and one combined sensor (e.g. CO_2 and atmospheric pressure sensors). Besides automating most of the growing tasks, PowerBot also allows the creation of safety protocols and procedures, that combined with the sensors/detectors can avoid overheating and overwatering, as well as minimize damage in case of fire or flood.

GroNode (the system's core module) manages the PowerBot wirelessly through radio frequency (RF) communication.

In this way, if it is necessary to add more peripherals, sensors, or even spare parts to help get the most out of GroLab, please consult the nearest specialized store (**opengrow.pt/store-locator**) or check out our online shop at: **opengrow.pt/shop** .



One GroLab GroNode is required to have access to all the PowerBot features.

Designed by Open Grow, Lda. Assembled in Portugal.

Learn quickly and easily with the GroLab Video Tutorials:
opengrow.pt/tutorials/

Open Grow Technical Support:
support.opengrow.pt
support@opengrow.pt

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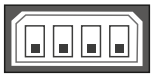
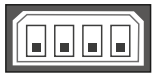
Revision 1
July 2023
GL-MN-0006-EN

SPECIFICATIONS

PowerBot Specifications

Hardware	HW08	*Power Consumption*	@5VDC - max. 350mA - 1.75W	*Internal Temperature Sensor*	Range: 0ºC~100ºC Precision: ±0.6ºC @ 25ºC
Dimensions	306.62mm x 101.40mm x 47.64mm (12.08in x 4in x 1.90in)	*Power Supply*	EU/UK/SA/AU Versions: 230VAC US Version: 120VAC	*Inter-Module Communication*	Radio Frequency - 2.4GHz
Net Weight	~930 grams (~32.8 oz)	*Outlets*	EU/US/SA/AU Versions: 4 x Universal Outlets UK Version: 4 x UK Outlets	*Includes*	Antenna Fuse 10A: - EU/UK/SA/AU Versions - 250VAC - US Version - 125VAC Universal Power Cord (2-meter cable): - EU Version @230VAC/10A - Shuko <-> C13 - AU Version @230VAC/10A - AS3112 <-> C13 - US Version @120VAC/13A - NEMA <-> C13 - UK Version @230VAC/10A - BS1363A <-> C13 USB Cable Type B-A (2-meter cable) Temp. & Hum. Sensor (2-meter cable)
Gross Weight	~1350 grams (~47.70 oz)	*Outlet Maximum Power*	Supply @230VAC: 2300W(10A) Φ>0.95 / 1000W(4.3A) Φ<0.95 Supply @120VAC: 1200W(10A) Φ>0.95 / 500W(4.1A) Φ<0.95		
Exterior	Casing: Stainless Steel and Acrylic Colors: Silver and White Buttons: On/Off Switch, Reset and 4 x Outlet Controller	*Connections*	USB 2.1 type B SMA female Power Entry IEC 320-C14 Temp. & Hum. Sensor (2.5mm 4-Pin male) Flood Detector (2.5mm 4-Pin male) Switch Sensor (2.5mm 2-Pin male) Combined Sensor (RJ12 6-Pin female)	*Warranty*	3-year limited hardware warranty
Visual Indicators	Status Green LED 4 x Outlet Status Green LED				
Operation Conditions	0 to 55ºC RH <95% non-condensing				
Expected Service Life	>5 years				

Useful Pinouts

Port Name	*Temperature & Humidity*	*Flood Detector*	*Universal Switch*	*RS-485*
Visual Representation				
General Specifications	Vsupply + 5VDC Temp. Range: -40ºC ~80ºC Hum. Range: 0% ~100%	Vsupply + 5VDC Digital Operation: ON/OFF	Vsupply + 5VDC Digital Operation: ON/OFF	Vsupply + 5VDC Range & Precision*

*It depends on the model of the sensor used. Check our online shop or partners for more information.

Frequency Band(s)	Max. Output Power (EIRP)
2.4 G	2.4 - 2.4835 GHz	100 mW

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MAIN FEATURES

POWER SUPPLIER

PowerBot provides power to all peripherals of the users' growing environment. It has four universal outlets capable of providing 10A* (per outlet and in total) or unlimited power when using an external electrical contactor.
*Value may vary depending on the load characteristics (check PowerBot Specifications for more details).

MANUAL CONTROL

This module comes with four external switches that give the user the ability to manually control all connected peripherals at any time on the spot.

CLIMATE

With the combination between the external temperature and humidity sensor and the capacity to independently control the electrical devices, PowerBot can perform precise climate automation. This feature makes this module a perfect tool to keep the ideal climate conditions for the users' plants to grow healthily.

COMBINED SENSORS

PowerBot offers an RS-485 communication port that supports, the most diverse variables of combined sensors such as CO_2, atmospheric pressure, and luminosity. These sensors make it possible to increase environmental control capabilities, as well as to act on devices based on them, guaranteeing optimal conditions.

LIGHTING

Automate any lighting system connected to PowerBot, from the latest LED panels to the traditional HPS lamps and even more. With just one PowerBot, one can control the lights in four different areas, add cool-down protection for HPS, and even use a channel to add that extra far red at sunset/sunrise. The GroLab advanced lighting offers complete freedom to customize the day cycle, meaning it is possible to set the cycle duration to 20 hours of combined day/night or even less.

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IRRIGATION
Automate the irrigation of any growing system with just one schedule, 15 minutes every hour. Set a drip system for a few seconds every day, or a few minutes every other day. With our tools and the ability to precisely control the users' water pump, from drip irrigation to full hydroponic systems, PowerBot and GroLab schedule capabilities allow users to pre-set the irrigation for any kind of system.

TANK LEVEL MANAGEMENT
This module supports one universal switch sensor of the user's choice like a water level sensor, allowing to continuously monitor the water level of the tank. With the right peripherals connected to the PowerBot, like water pumps, users can create procedures to automatically stop all irrigation procedures if the water level in the tank is not suitable.

FLOOD PREVENTION & DETECTION
Equipped to handle a flood detector, it will quickly detect leaks and excess water. In this way, the security features that the user has programmed will activate automatically to minimize damage and even notify of any anomaly.

SAFETY PROTOCOLS & PROCEDURES
PowerBot allows the user to create safety protocols and procedures to avoid risky situations or even react to them to minimize damage. The cool-down feature prevents damage to devices that need some time to cool down before turning them ON (e.g. HPS lamps), the flood detector allows the user to detect leaks and shut down any devices they might see fit, and the security actions when losing communication with GroNode.

MODULE COMUNICATION
PowerBot communicates with GroNode through radio frequency with a range of 25 meters (82 feet) indoors (depending on obstacles) and 100 meters (328 feet) in open spaces. This makes it easy to install the PowerBot on the users' growing area or even on the outside.

MONITOR & ANALYSIS
Using GroLab Software the user can monitor and analyze the climate variables and the device's current state in real time. The software provides notifications, charts, and grow(s) overview and even allows the export of the sensors/devices values from the beginning of the users' grow(s) life cycle.

NOTIFICATIONS
If PowerBot senses something gets out of bounds, with the assistance of GroNode, it can send real-time alerts and updates to the users' e-mail (max of 20 e-mail notifications per hour) about the state of the devices and sensors connected to it. They just need to allow GroNode to access the internet, and configure it to notify in case any issue arises.

LED INDICATOR
Its design features five LEDs, one per outlet (PowerBot offers four outlets) that indicate if the plugged device is ON, being useful to visually understand what is happening in the users' grow(s). Besides the LEDs of the outlets, this module includes a LED that indicates if the module is currently powered (LED blinking), and the connection state with GroNode (LED static). This status LED operation is fully configurable by the user.

FREE FIRMWARE UPDATES
One of the advantages of a digital system is the ability to receive updates that can be easily applied. With this in mind, the Open Grow team works every day to fix any reported/discovered bugs as well as to improve and add new features to the GroLab system (software and modules). These updates are free of charge and can be quickly obtained through the GroLab Software with just a few clicks.

REMOTE CONTROL
Connecting the GroNode to a router with an Internet connection allows the user to activate the GroLab system's remote control. This feature grants user access from anywhere at any time through the GroLab Software, allowing complete control of all the modules, including PowerBot.

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INSTALLATION EXAMPLE

The image below (Figure 1) represents a generic installation of a PowerBot module, however, the installation may differ depending on the user's needs as it can, for example, be installed outside the growing area.

In this installation example, the versatility of the PowerBot is perfectly visible, being useful in various situations like supplying power to all peripherals of the growing environment, irrigation system management with increased precision, and ambient control measured with combined sensors to keep the ideal climate conditions.

Besides being a complete power supply module, it also can monitor the level of any tank through a water level sensor. With this, the user doesn't have to worry about draining and refilling the tank.

Expand the lighting system across four different areas with a PowerBot. GroLab offers advanced tools that allow full customizing of the day/night cycle length and other lighting characteristics.

Finally, this module has a major impact on security due to its ability to connect a flood detector and a smoke or motion detector which are extremely useful to notify the user (via e-mail and software) to mitigate eventual water leaks and avoid risky situations.

The installation/use of PowerBot should be adjusted according to the growing environment and user's needs. If there is a need for help, please reach out to any GroLab representant or directly to us, we will be happy to assist.

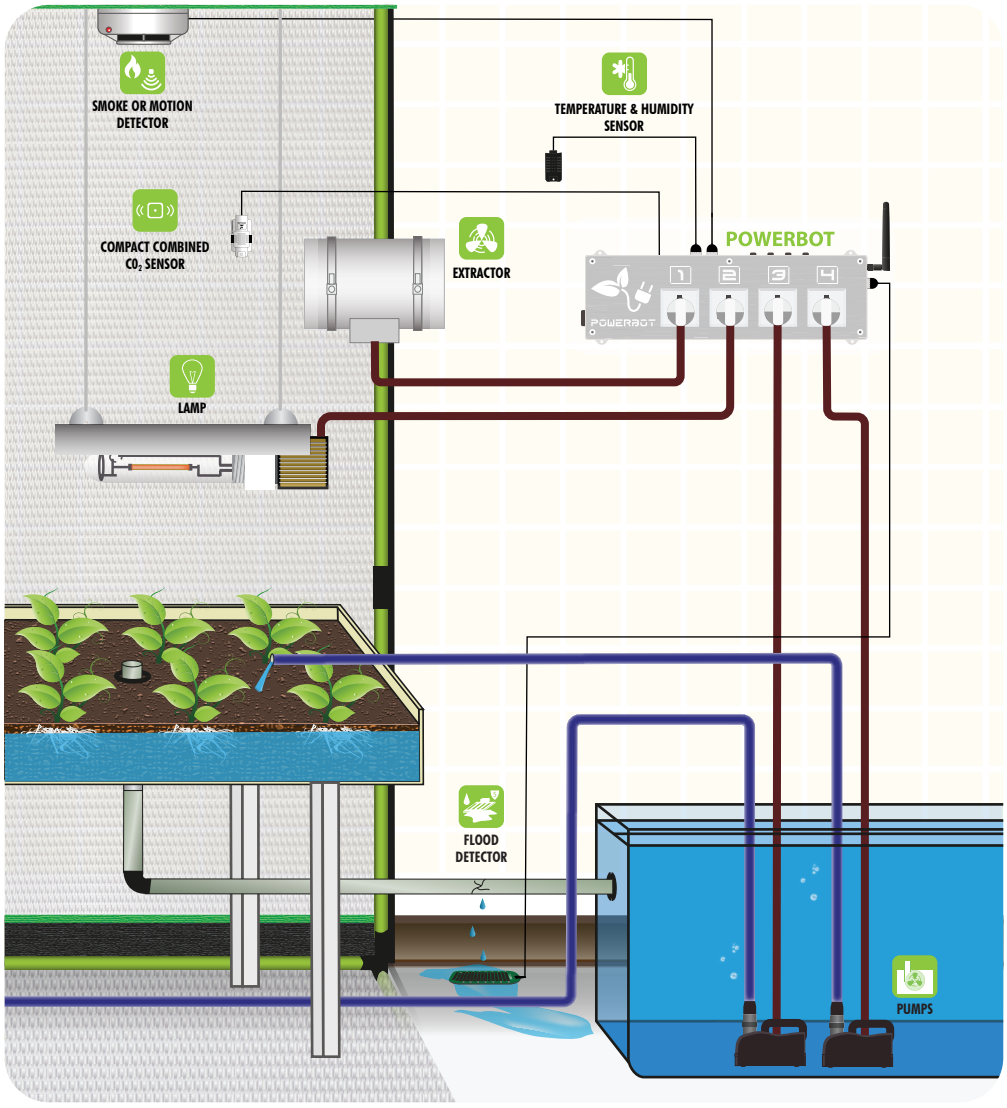

Figure 1 - PowerBot Installation Example Schematics

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USEFUL TIPS

To facilitate and avoid possible issues, please find below some tips regarding the installation of PowerBot.

➤ PowerBot offers some extra security features, one of which is the "Cooldown Time", which prevents damage to devices like HPS lamps that need some time to cool down before turning them ON.

➤ PowerBot supports a flood detector and a smoke/motion detector, providing extra security to the growing area. If an intrusion is detected, GroLab can shut down all devices until the user interferes.

➤ Controlling the growing environment is the main purpose of PowerBot. In addition to lighting control, it supports devices like extractors and fans that maintain much of the temperature and humidity.

For better wireless communication

➤ Ensure that the maximum distance between PowerBot and GroNode is not exceeded, typically 25 meters (82 feet) indoors and 100 meters (328 feet) in open areas. In addition, avoid obstacles between PowerBot and GroNode.

➤ Do not install the PowerBot near other equipment that communicates wirelessly (including GroLab modules), ensuring a minimum of 20 centimeters (0.66 feet) between equipment.

➤ Make sure antennas are screwed on tightly and positioned upward. When the module is installed on the wall, the antenna must be parallel to the wall. If the module is on a surface (a table, for example), the antenna must be perpendicular to the surface.

To increase the lifetime and ensure the best functioning of the PowerBot

➤ Keep the PowerBot out of extremely humid areas and prone to contact with water. When installed outdoors, PowerBot must be protected from environmental factors.

➤ Perform periodic maintenance to ensure that PowerBot remains clean and dust free.

USEFUL AUTOMATION PROCEDURES

Two main types of automation procedures can be created with the GroLab system: Schedules and Alarms.

The first type offers all the tools a grower expects from a scheduling system and even more. The second one makes it possible to trigger actions based on conditions, those actions/conditions can be freely chosen by the user.

Among several options, these procedures can act in any device or group of devices that belong to an area/grow. In addition, they provide distinct action modes, including timed actions.

These can be notified to the user by sending a warning e-mail or through sound (GroNode's buzzer).

To make it easy to understand and configure, we prepared some automation procedures examples that can be configured when using the PowerBot and its devices/sensors:

➤ In Figure 2 there is a representation of an alarm that when the sensor detects a humidity value below 37.5%, the humidifier is turned ON until it reaches a value higher than 42.5% after it turns OFF the humidifier. Ensuring the humidity is always close to 40%.

Figure 2 - Low Humidity Alarm Example

Figure 3 - Water Pump Alarm Example

➤ Figure 3 shows an alarm that turns ON the air pump for 1 minutes every time the water pump starts working, ensuring the supply of a proper oxygenated nutrient solution to the plants.

Note: Using this alarm is not enough to ensure good oxygenation and mixing of the tank, so it is recommended to use the air pump more regularly.

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➤ Figure 4 illustrates a light schedule with a duration of 12 hours straight (7 a.m. - 7 p.m.) from Monday to Sunday. This schedule has an active persistence action that forces the action to work constantly, whenever there are conditions for this. For example, if the user turns OFF the light directly on the Powerbot, the configured persistence on this schedule will immediately turn ON the light back again.

Figure 4 - Light Schedule Example

Figure 5 - Irrigation Schedule Example

➤ Figure 5 represents a recurrent schedule where the water pump turns ON for 1 hour. This action repeats every Monday and Friday, from 5 a.m. to 6 a.m.

➤ Figure 6 shows a schedule that turns ON the water pump for 10 minutes, and this process is repeated 50 minutes later, every day. This schedule is programmed to send an e-mail when it starts and finishes.

Figure 6 - Irrigation Schedule Example

Figure 7 - Irrigation Schedule Example

➤ In Figure 7 there is a representation of a schedule that turns ON an air pump for 30 seconds, every 5 minutes.

➤ Figure 8 illustrates an alarm where if the level of water is low it will turn OFF the water pump. This alarm has an active persistence action that forces the action to work constantly, whenever there are conditions for this.

Figure 8 - Low-Level Water Alarm Example

Figure 9 - Security Alarm Example

➤ Figure 9 shows a security alarm programmed to automatically turn OFF all devices from the grow when a leak is detected by the flood sensor. This will send a warning e-mail and all automation procedures related to the grow will be suspended until user validation, preventing the problem escalation.

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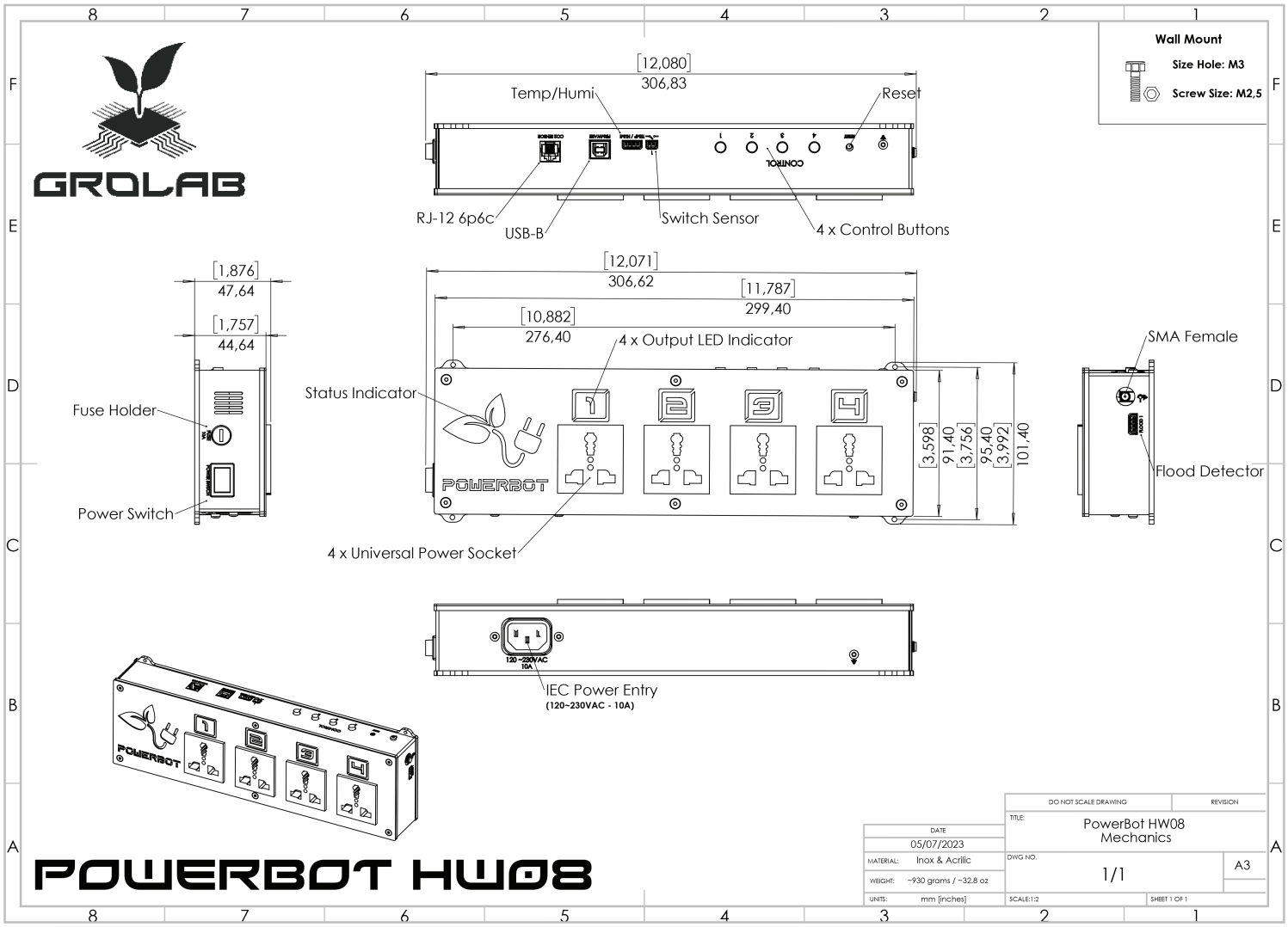
MECHANICS EU/AU/US VERSION



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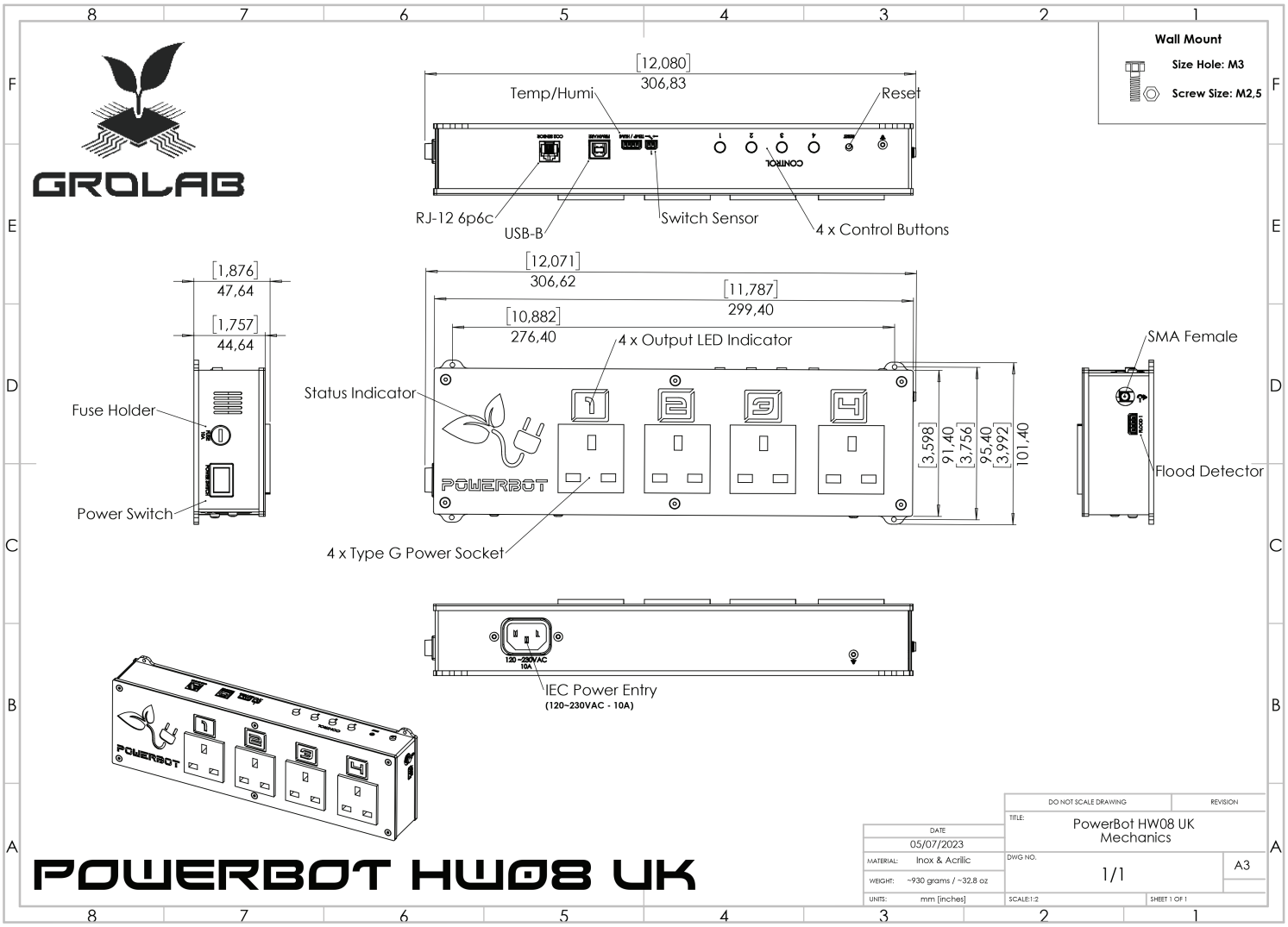
MECHANICS UK VERSION



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COMPLIANCE

This symbol on the product or packaging means that according to local laws and regulations, this product should not be disposed of in household waste but sent for recycling. Please take it to a collection point designated by your local authorities once it has reached the end of its life, some will accept products for free. By recycling the product and its packaging in this manner you help to conserve the environment and protect human health.

This symbol on the product or packaging means that this product is compliant with RoHS Regulations of the European Parliament and Council Directive on the Restrictions of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2011/65/EU).

This symbol on the product or packaging means that this product complies with the following directives and regulations:
- (2014/53/EU) Radio equipment directive.
- (2011/65/EU) RoHS directive.
- (2014/35/EU) Low voltage directive.
- (2014/30/EU) EMC.

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