

buzzard

by multipowr



buzzard40

Safety and Installation Manual

1 Table of Contents

1	Table of Contents	2
2	Introduction	4
3	Features	5
4	Specifications	6
4.1	General specifications	6
4.2	Cooling options	7
4.2.1	Cooling of the Bird	7
4.2.2	Cooling of the Nest-40A	7
4.3	Bird output absolute limits and load dump	7
4.3.1	Bird output protections	7
4.3.2	Load dump protections	7
4.3.3	Bird absolute maximum voltage	8
5	Mechanical installation	8
5.1	Mounting dimensions	8
5.2	Mounting of the Bird	10
5.2.1	Mounting of the Bird without heatsink	10
5.2.2	Mounting of the Bird with 40 mm fin heatsink	11
5.2.3	Mounting of the bird with fan	12
5.3	Mounting of the Nest-40A	13
5.3.1	Mounting of the Nest-40A without heatsink or fan	13
5.3.2	Mounting of the Nest-40A with 40 mm fin heatsink	13
5.4	Presence of neighboring metal parts	14
5.5	Use of connector covers for the Bird	14
5.6	Mounting of the Nest-2800W	15
6	Quick start guide	16
6.1	Bird setup	16
6.1.1	Connecting the battery	16
6.1.2	Behavior of the ENABLE IN pin	16
6.1.3	CAN bus	17
6.1.4	FAN connector	17

6.2	Nest setup.....	17
6.2.1	CAN bus	17
6.2.2	I/O.....	18
6.2.3	Nest-2800W to Nest-40A cable	19
6.2.4	Grid connection.....	19
6.3	Basic operation with the 'Diagnostic PC Tool'.....	19
7	Electrical wiring	20
7.1	Nest Wall Nest-2800W grid wiring.....	20
7.2	Bird to battery wiring	21
7.3	Nest-2800W and Bird CAN bus connector and wiring.....	22
7.4	Nest-2800W I/O connector and wiring	23
7.5	IEC Protection classes.....	23
8	Paralleling of buzzard modules	24
8.1	Electrical power connection of Nest-2800W	24
8.2	Electrical power connection of Birds	24
8.3	Hardware enabling of the Birds.....	24
8.3.1	Using external 24V power supply	25
8.3.2	Using ENABLE OUT output.....	25
8.3.3	Spacing between parts of a paralleled system.....	26
9	Safety instructions - cautions.....	28
9.1	Electrical	28
9.2	Heat.....	28
9.3	Electromagnetic field.....	28
9.4	Mounting.....	29
10	Derating.....	30
10.1	Nest heating and derating.....	30
10.2	Bird heating and derating	30
11	Maintenance	31
12	FCC compliance statement.....	31
13	Warranty	31

2 Introduction

The Multipowr buzzard40 is a versatile device designed to provide both continuous and opportunity charging capabilities.

The device system consists of two main components: The **Nest** is the energy transmitter, the *Nest-2800W* is connected to the AC grid. The **Bird** is the energy receiver, it is connected to the battery. The *Bird* fully controls the charging process through a wireless connection with the *Nest* modules.

To facilitate seamless integration, both the *Bird* and *Nest* feature a CAN bus interface.



Figure 2-1 buzzard40 overview

This manual is valid for the following 2 product combinations:

Combination 1:	
buzzard 40 - Nest - 1500 W	Input: 110 V - 240 V
buzzard 40 - Bird	Output: 0 - 40 ADC 18 - 60 VDC (*)
Combination 2:	
Buzzard 40 - Nest - 2800 W	Input 220 V - 240 V
Buzzard 40 - Bird	Output: 0 - 40 ADC 18 - 60 VDC

Table 1 products covered in manual

(*) In case of higher battery voltages, the output power will be derated so as to limit the input to the rated input power

3 Features

The buzzard40 comes with a range of features that make it an efficient and practical choice for various applications.

It offers extremely efficient charging for **all battery chemistries**, making it suitable for a wide range of battery-powered devices. One of its key advantages is the ability to be retrofitted to standard battery chargers and contacts, allowing for **easy integration into existing systems**.

The device is designed to thrive in enhanced environments, including harsh weather conditions, while decreasing fire risk due to sparks. This not only ensures **safety** but also enhances the **durability** of the charging solution. With **lower total cost of ownership** due to **minimal maintenance** requirements and the absence of contacts, it offers a **long lifespan** while keeping operation costs in check.

The device also offers practical features such as easy ingress protection options, allowing **for reliable operation in various environments**. It has a wide operating temperature range of -20°C to 45°C, ensuring functionality in diverse conditions.

The device is designed for **easy integration**, with options for floor mount or side mount integration.

The *Bird* comes with integrated rectifier electronics, allowing for **direct connection to the battery**. The device allows **easy paralleling** for **120A**, ensuring efficient charging for higher power applications.

Different battery charging curves are included, with options for:

- Constant Current (CC),
- Constant Current - Constant Voltage (CC-CV).

The *Nest* I/O allows easy connection of signaling lamps or signaling towers, as well as reset input. Control can be achieved through CAN Bus with the option for CANopen.

4 Specifications

4.1 General specifications

buzzard 1.5 – 2.8 kW / 40A	
Nest	Bird
buzzard40 – 1500W – 110/230 V	buzzard40 – 40A – 24V/48V
buzzard40 – 2800W – 230 V	
Electrical Specifications	
Input Voltage	
buzzard40 – Nest – 1500W	110 ... 240 VAC +- 10% / 50 ... 60 Hz
buzzard40 – Nest – 2800W	220 ... 240 VAC +- 10% / 50 ... 60 Hz
buzzard40 – Bird – 40A	18 ... 60 VDC (min max) 24/48V VDC (nominal) 0 ... 40 ADC
Efficiency, Gap and Alignment	
Nominal efficiency	93%
Nest-40A – Bird gap	≤ 30mm
Nest-40A – Bird alignment	-30 ... 30mm
Battery	
Battery	All chemistries
Battery charging schemes	Constant Current Setpoint (CC) Constant Current-Voltage Method (CC-CV)
Control and Diagnostics	
CAN interface	CAN 2.0A / CAN Matrix or CANopen
LAN (ethernet) interface	Prepared
Diagnostics	Multipowr Diagnostics PC Tool
Pairing connection time Nest & Bird	0.1 – 1.5s
Bird auxiliary supply 24V INPUT/ENABLE	≤ 6W
Protections	
Reverse polarity	Yes, will not connect to battery
Wrong battery voltage	Yes, will not connect to battery
Thermal overload	Yes, derating and fault state
Self-test	Yes
Fault condition	Yes, internal disconnection of battery
Alignment detection	Yes

Table 2 buzzard40 specifications

4.2 Cooling options

The buzzard40 *Bird* and *Nest-40A* can be cooled in various ways, the following sections will enumerate over the options.

4.2.1 Cooling of the *Bird*

The *Bird* can be cooled in the following ways:

1. **Conduction:** the *Bird* can be mounted onto an aluminium plate that has suitable heat conduction to spread the heat. For installation see 5.2.1.
2. **Heatsink:** the use of convection cooling by its 40 mm heatsink. For installation see 5.2.2.
3. **Fan:** the *Bird* can also be cooled using an additional fan. For installation see 5.2.3.

4.2.2 Cooling of the *Nest-40A*

The *Nest-40A* can be cooled in the following ways:

1. **Conduction:** the *Nest-40A* can be mounted onto an aluminium plate that has suitable heat conduction to spread the heat. For installation see 5.3.1.
2. **Heatsink:** the *Nest-40A* can be cooled using an additional 40 mm heatsink. For installation see 5.3.2.

4.3 *Bird* output absolute limits and load dump

4.3.1 *Bird* output protections

To ensure the safety and longevity of the *Bird* output, several protection mechanisms have been implemented:

1. Hardware Overvoltage protection: In the event that the output voltage surpasses 67V, the hardware activates fast overvoltage protection. This protection mechanism allows the output voltage to momentarily reach a maximum of 67V for typically 30ms and up to 500ms.
2. Controlled derating of output current: When the output voltage exceeds the voltage set-point+1 V, the *Bird* automatically reduces the output current, eventually down to 0A. This protection mechanism works slowly.
3. Software controlled current and overcurrent protection: The *Bird* features software-controlled current and overcurrent protection at 46A. This protection mechanism responds to excessive current flow at a slow rate.
4. Fast reverse current protection is provided to guard against reverse currents up to -7A. This protection mechanism responds quickly to reverse current events.

Throughout all these protection mechanisms, the internal auxiliary supply remains active as long as the battery is connected or an external auxiliary supply is provided. For more information on the auxiliary supply, refer to 6.1.2.

4.3.2 Load dump protections

In the event of sudden battery disconnection (such as when the contactor is opened or switched off by the Battery Management System), the *Bird* automatically safeguards itself and promptly shuts off the output at 67V. To ensure proper functioning, it is both recommended to utilize electronic components

in the battery electronics and Battery Management System (BMS) with a voltage rating of 80V or higher.

4.3.3 Bird absolute maximum voltage

The *Bird* is internally protected against reverse polarity up to a reverse voltage of -78V. Therefore, voltages exceeding 78V should never be applied to the *Bird* to prevent potential damage or malfunction.

5 Mechanical installation

This section covers the mechanical installation of the *Bird* and *Nest-40A*

If the installation of the pads makes use of a mounting plate this mounting plate must be made out of aluminium, stainless steel or plastic. For effective conductive cooling, please note that the plate must be made out of aluminium with a thickness greater than 3mm. If the cooling arrangements are improper, output current derating will take place, see section 10 Derating.

⚠ During product design it is advised to verify the temperatures.

The mounting hardware (screws and washers) must strictly be made out of stainless steel. The mounting hole depth of the *Bird* and *Nest* is 6mm. The following examples will show mounting plates with a thickness of 4mm, if thinner mounting plates are used please account for shorter screw lengths.

⚠ The mounting torque must not surpass 5.5 Nm.

5.1 Mounting dimensions

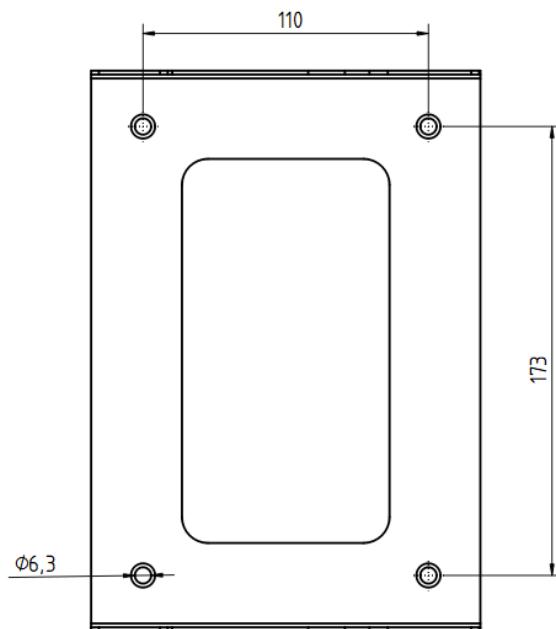


Figure 5-1 : mounting dimensions for Nest-2800W bracket

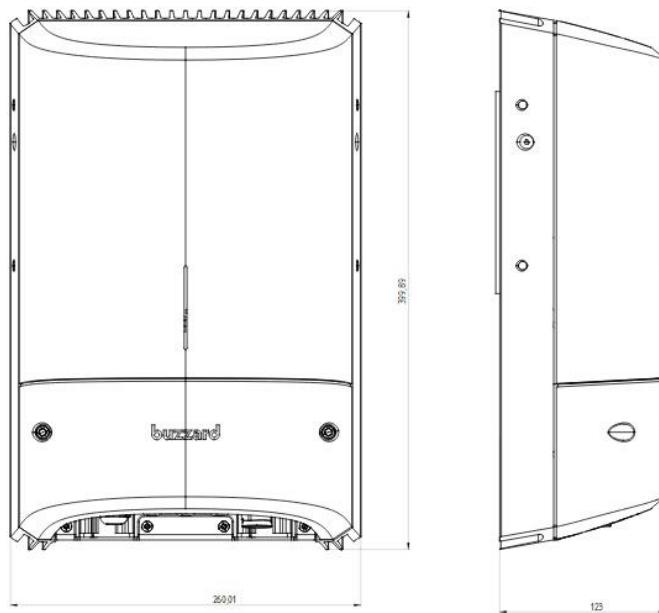


Figure 5-2 : dimensions of Nest-2800W

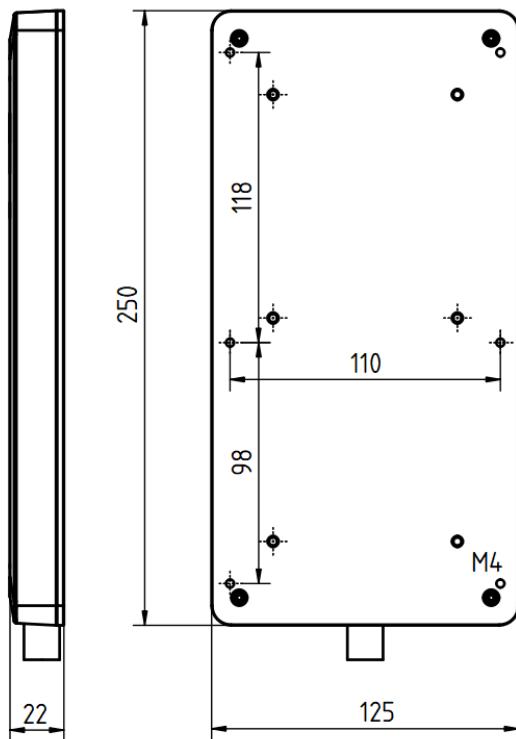


Figure 5-3 : dimensions of Nest-40A

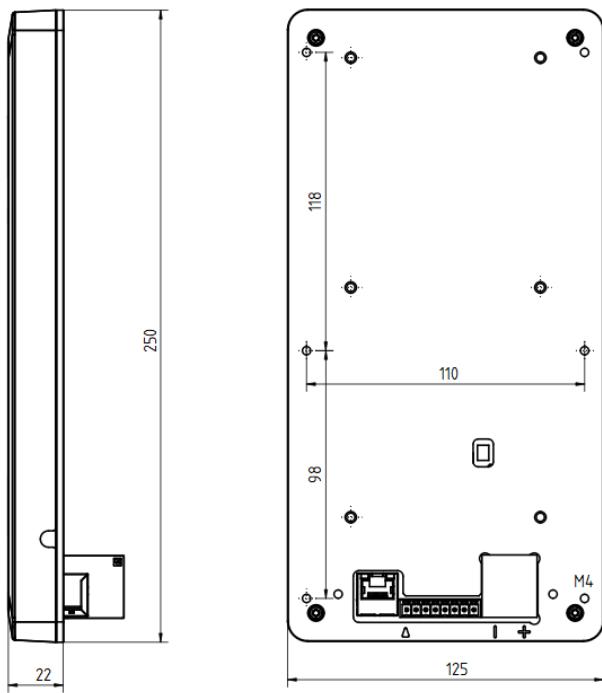


Figure 5-4 : dimensions of Bird-40A

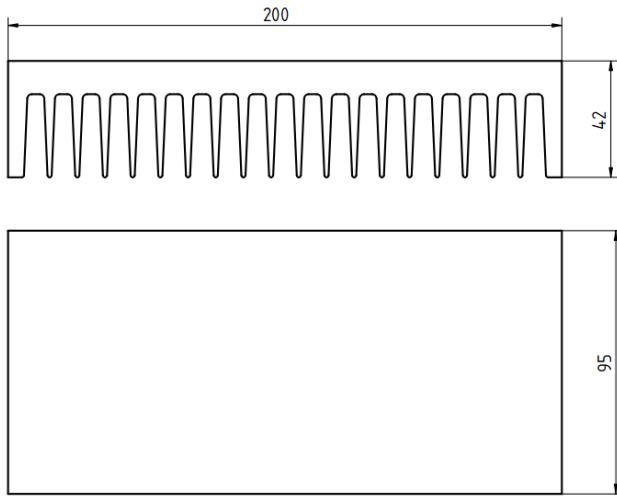


Figure 5-5 : dimensions optional heatsink for pads

5.2 Mounting of the Bird

5.2.1 Mounting of the Bird without heatsink

When using a mounting plate, the only requirement is to have a hole with dimensions of 37mm x 98mm. This hole is necessary for proper installation of the wiring.

5.2.2 Mounting of the Bird with 40 mm fin heatsink

When utilizing the 40 mm fin heatsink, it is necessary to have a larger opening in the mounting plate. The specified dimensions for this opening are 239,25 x 98 mm.

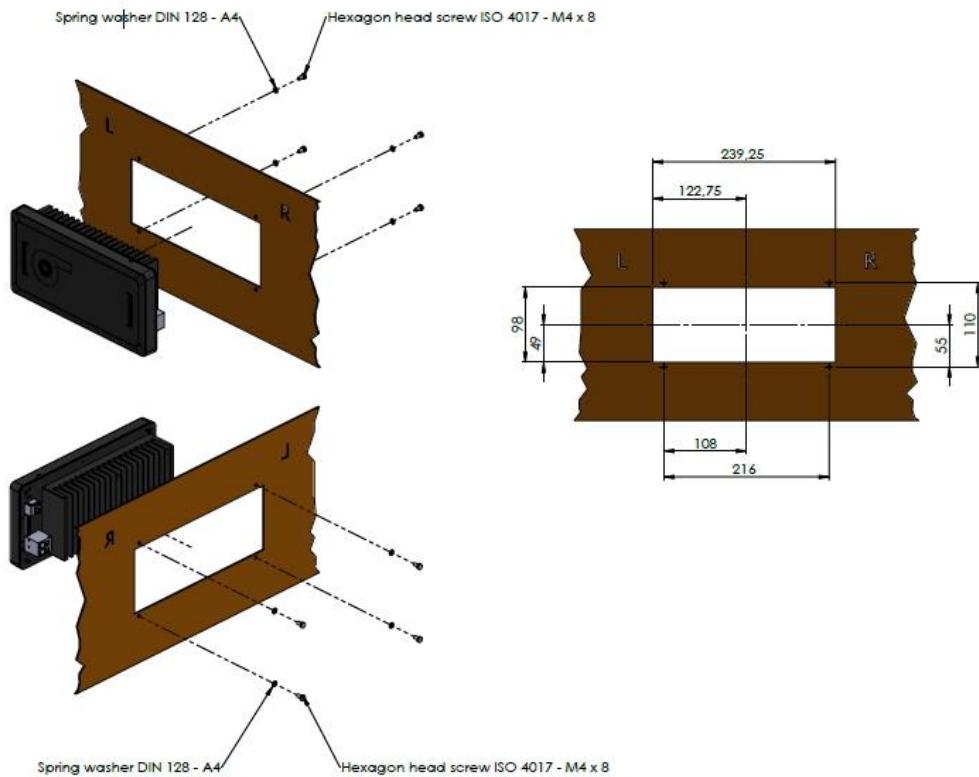


Figure 5-6 Cooling of the Bird with additional 40 mm fin heatsink

5.2.3 Mounting of the bird with fan

When utilizing the 40 mm FAN, it is important to have a larger opening in the mounting plate to allow for proper installation. The recommended dimensions for this opening are 239.25 x 98 mm. This will ensure adequate space for the heatsink and facilitate effective heat dissipation.

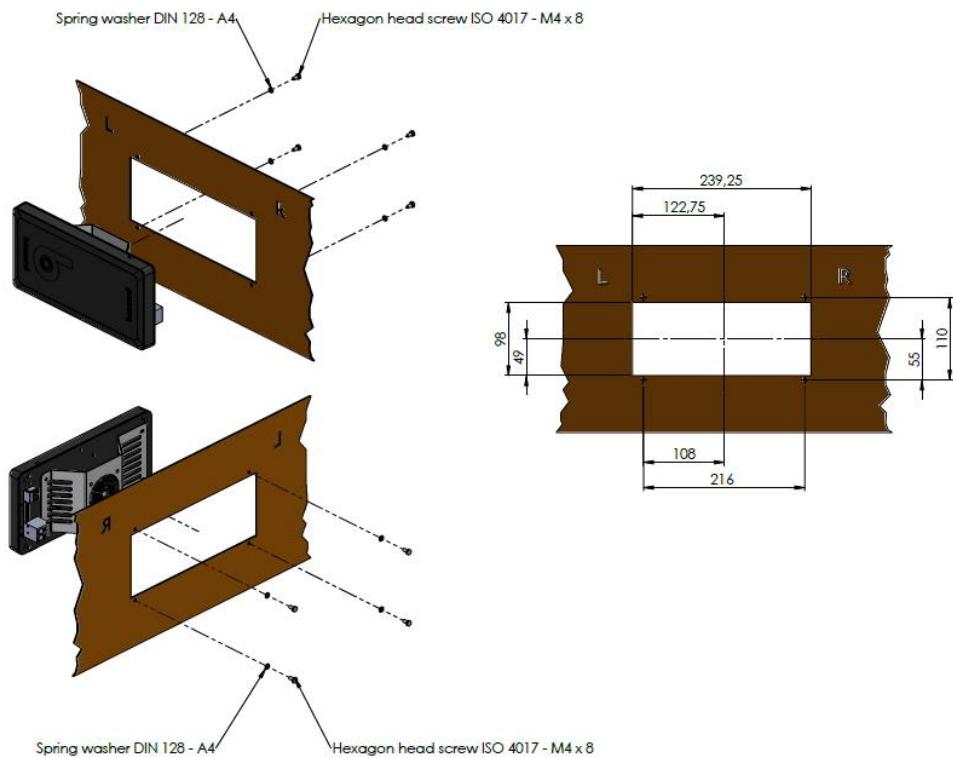


Figure 5-7 : Bird with an additional fan

5.3 Mounting of the Nest-40A

5.3.1 Mounting of the Nest-40A without heatsink or fan

The mounting plate does not require a hole when the *Nest-40A* is mounted without the heatsink.

5.3.2 Mounting of the Nest-40A with 40 mm fin heatsink

When installing the 40 mm fin heatsink, it is necessary to have a larger opening in the mounting plate. To accommodate the heatsink, the dimensions of this opening should be 203 x 98 mm. This will allow for proper installation and optimal heat dissipation

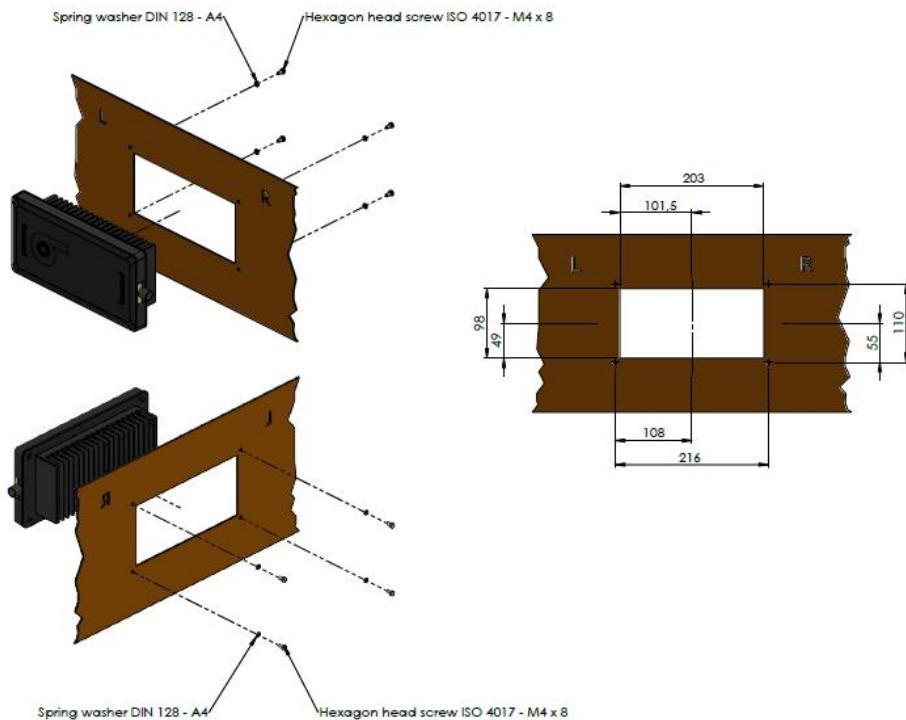


Figure 5-8 Nest-40A with additional 40 mm fin heatsink mounted on an aluminium plate

5.4 Presence of neighboring metal parts

Metal parts are only allowed in the zones depicted in Figure 5-9.

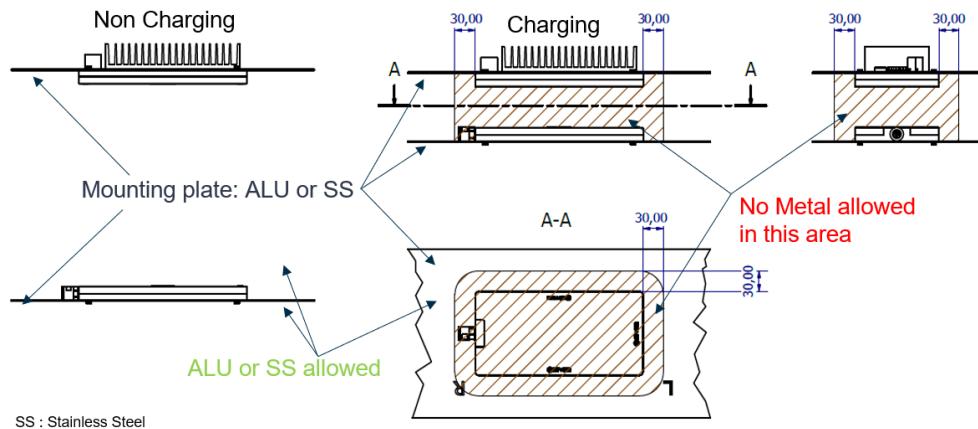


Figure 5-9 No metal zones

5.5 Use of connector covers for the Bird

The *Nest-2800W* and *Bird* are rated IP20 without connector covers.

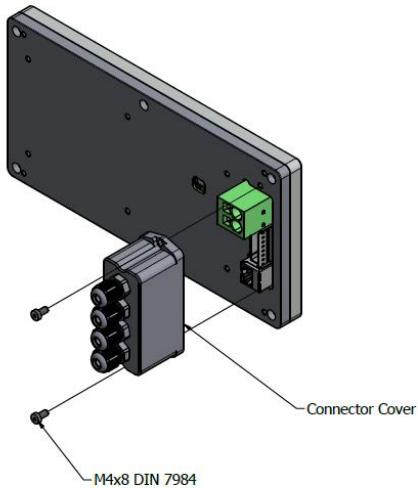


Figure 5-10 Bird connector cover

5.6 Mounting of the Nest-2800W

When the *Nest-2800W* is integrated into an electrical cabinet, it is advised to verify no derating occurs during worst case operation conditions of grid voltages, charging and ambient temperatures.

The *Nest-2800W* is foreseen of 1 mounting hole for fixation to the bracket. The screws DIN 7380 – 2 – M4 x20 / A2 type are included in the module package

Around the *Nest-2800W*, a free area of at least 100mm in the horizontal direction, at least 150 mm in the vertical direction, and at least 50mm in the perpendicular direction is advised. This is for cooling and servicing reasons.



Figure 5-11 Mounting Nest-2800W on bracket

6 Quick start guide

The next section describes a basic system start up. More features and functionalities are described in the user manuals of the buzzard40.

6.1 Bird setup

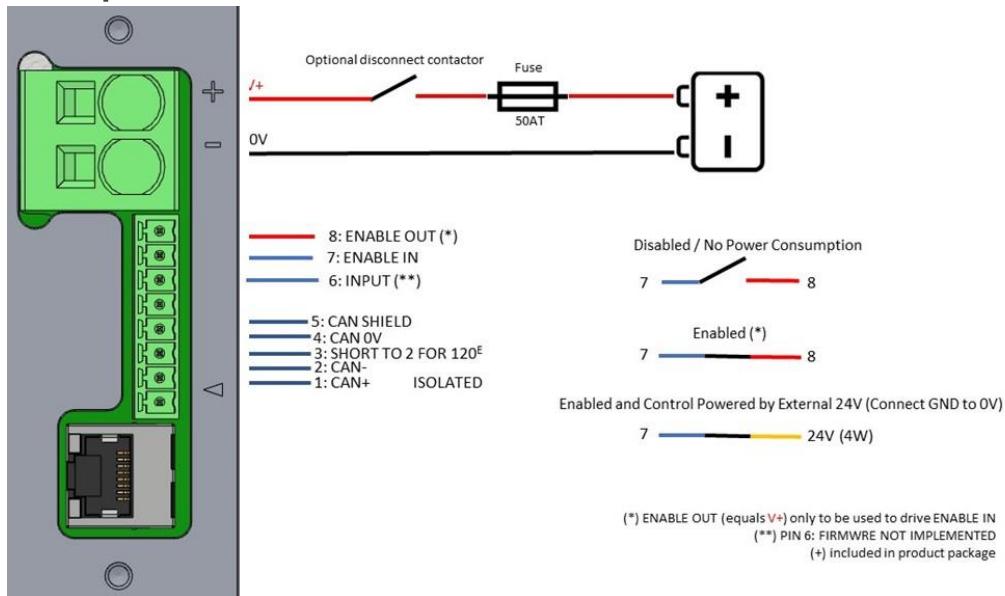


Figure 6-1 Wiring schema of the bird

6.1.1 Connecting the battery

To connect the battery to the Bird, you will need to utilize two snap-in connectors.

⚠ It is essential to note that the use of an external fuse is mandatory. Multipowr recommends using a 50AT fuse for proper protection. E.g. the Littlefuse 157.5701.550, is suitable for this specific application. Provide near the fuse the following markings in a font size not smaller than 2.8mm.

- **Use 50AT Fuse**
- **CAUTION: DISCONNECT SUPPLY BEFORE CHANGING FUSE**
- **ATTENTION: COUPER L'ALIMENTATION AVANT DE REMPLACER LES FUSIBLES**

While a battery disconnect contactor can be used, it is important to mention that Multipowr does not provide this component.

6.1.2 Behavior of the ENABLE IN pin

When the ENABLE IN pin is left open, the Bird hardware is disabled and consumes no internal power. To activate the Bird and turn it on, you can use one of the following options:

Option 1: Connect the ENABLE IN pin to the ENABLE OUT pin, where the ENABLE OUT pin has a voltage approximately equivalent to the battery voltage V+. Use the ENABLE IN pin solely for this purpose.

Option 2: Connect the ENABLE IN pin to an external galvanic insulated auxiliary power supply of 24 VDC (6W). Note that this power supply should be separate and dedicated for the ENABLE IN pin only.

6.1.3 CAN bus

The *bird* can be controlled by a CAN bus connected to either an external PLC, controller or with the **Multipowr Diagnosis Tool** for PC. The Multipowr Diagnosis Tool act also as Firmware Updater.

6.1.4 FAN connector

The FAN connector should only be used in conjunction with the 'FAN BRACKET' option. It should not be used for any other purposes.

6.2 Nest setup

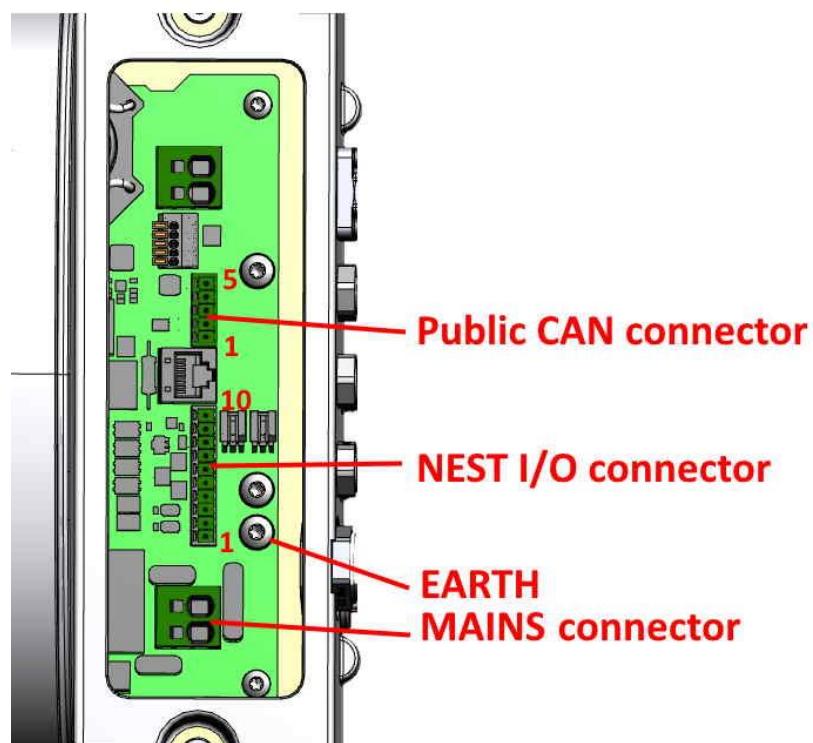


Figure 6-2 Nest connectors

6.2.1 CAN bus

The *Nest* can be connected to a CAN bus to monitor his behavior or update the firmware via the Multipowr **Diagnosis Tool**.

Pin number	Pin name	Pin functionality
1	CAN +	CAN high data wire
2	CAN -	CAN low data wire
3	CAN termination	Short-circuit to pin2 to terminate the bus with 120ohm.
4	CAN 0V	The 0V reference for CAN high & low
5	CAN shield	EMC shield

Table 3 : Pin table of CAN connector

6.2.2 I/O

The I/O connector is designed with pre-defined inputs and outputs for seamless and cost-effective integration into a charging station. The specific functionalities of each pin can be found in Table 4 : Pin table of I/O connector

A possible implementation is shown in Figure 6-3

Pin number	Pin name	Pin functionality
1	24V out	The internal made 24V (max. 100mA)
2	IN0 input (PNP, 5mA)	For future use
3	Reset input (PNP, 5mA)	This pin is used to reset any fault conditions that may occur.
4	0V	The 0V reference
5	POWER output (Solid state, 20mA)	When active, this pin indicates that the Bird device is ready to start the charging process.
6	OUT0B	Connect to pin4
7	Charging output (Solid state, 20mA)	This pin is used to indicate that the charging process is currently in progress.
8	OUT1B	Connect to pin4
9	Fault output (Solid state, 20mA)	When active, this pin signals the occurrence of a fault condition.
10	OUT2B	Connect to pin4

Table 4 : Pin table of I/O connector

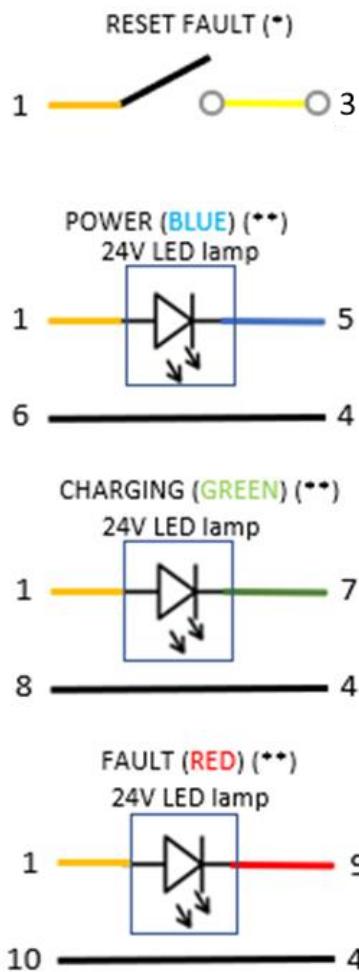


Figure 6-3 IO connector Nest-2800W using 24V Led lamps

6.2.3 Nest-2800W to Nest-40A cable

⚠ Verify all cable screw connections are fastened with 1 Nm.

The standard length of the cable between *Nest-2800W* and *Nest-40A* is 2m. If a longer cable length is needed, one can buy an extension cable at Multipowr. The max length of the cable between *Nest-2800W* and *Nest-40A* is 6m.

⚠ Do not install the extension cable when the *Nest-2800W* is connected to the grid.

6.2.4 Grid connection

Requirements for the grid connection can be seen in 7.1.

6.3 Basic operation with the 'Diagnostic PC Tool'

If the commissioning of the product requires a test of the charging, a possible choice can be using the PC tool described in the CANtool quickstart guide.

7 Electrical wiring

7.1 Nest Wall Nest-2800W grid wiring

Device	Grid connection	Electrical specifications	Overvoltage Category
buzzard 40 - Nest - 1.5 kW	L, N, PE	110 – 230 VAC (+/- 10%), 50 – 60 Hz	3
buzzard 40 - Nest - 2.8 kW	L, N, PE	210 – 230 VAC (+/- 10%), 50 – 60 Hz	3

Please follow the guidelines below to ensure proper protection of the system:

1. Circuit Breaker: Install a circuit common trip type breaker with a rating of 16A. Additionally, ensure that the breaker has a short-time withstand current limit of minimum 10 kA.
2. DC Current and RCD: In case of internal isolation failures, this product may cause a DC current in the PE conductor. To protect against electrical shock, only use an RCD (Residual Current Detector) of Type B on the supply side of the product. It is important to note that no other equipment should be connected to this specific RCD.
3. Cord Type: Select the connection cords according to the local and applicable standards. Ensure that the chosen cords comply with the necessary mechanical properties and allowable conductor cross section as specified Table 5. The cord outer diameter must be between 9 and 14mm.
5. The maximum tightening torque of the cable gland is 8Nm, but tightening must be stopped when the pressure screw is flush with the sealing insert.



Figure 7-1 : pressure screw is flush with the sealing insert

Mechanical properties	
Stripping length	15 mm
Connection data	
Conductor cross section solid min.	0.2 mm ² (24AWG)
Conductor cross section solid max.	10 mm ² (8AWG)
Conductor cross section flexible min.	0.2 mm ² (24AWG)
Conductor cross section flexible max.	6 mm ² (10AWG)
Conductor cross section flexible, with ferule with plastic sleeve min.	0.2 mm ² (24AWG)
Conductor cross section flexible, with ferule with plastic sleeve max.	4 mm ² (12AWG)

Table 5 Mechanical properties and allowable conductor cross section of grid supply connector

7.2 Bird to battery wiring

Please adhere to the following recommendations for the proper selection and installation of connection cables:

1. Wire temperature rating and Isolation Thickness: Use 90 °C rated wire with a minimum insulation thickness of 1.52 mm. This ensures that the wire can handle the proper temperature and insulation requirements for safe and efficient operation.
2. Output Wiring type: The type of connection cables used should comply with both local and applicable standards. Refer to Table 6 information regarding the mechanical properties and allowable conductor cross-sections of the connector.

Mechanical properties	
Stripping length	7...8 mm
Connection data	
Conductor cross section solid min.	0.75 mm ²
Conductor cross section solid max.	16 mm ²
Conductor cross section flexible min.	0.75 mm ²
Conductor cross section flexible max.	16 mm ²

Table 6 Mechanical properties and allowable conductor cross section of the battery connector

7.3 Nest-2800W and Bird CAN bus connector and wiring

Depending on the way of control and/or monitoring the charging process, it can be needed to make a CAN connection to Nest and/or Bird

For proper installation and compliance with the specifications, please note the following guidelines:

1. Maximum CAN Cable Length: Ensure that the CAN cable length does not exceed 10 meters. This will help maintain reliable communication and prevent signal degradation.
2. Wire Rating and Isolation Thickness: Use 90 °C rated wires with a minimum isolation thickness of 1.52 mm for the CAN bus connections. This ensures the wires can handle the required temperature and provide adequate insulation.
3. Wiring Rating: The customer must use wiring that is capable of handling a current of 2 A. This ensures the wiring can handle the load without any risk of overheating or damage.
4. Shielding for Immunity: To comply with immunity standards, connect the shield of the *Nest* CAN cable to pin CAN SHIELD and the shield of the *Bird* CAN cable to pin CAN SHIELD.
5. Termination of CAN Bus: If the product is the first or last device on the CAN bus, terminate the CAN bus by shorting CAN-PIN 2 to PIN 3 on the CAN connector. This ensures proper signal termination and prevents signal reflections.
6. Please consult Table 7 for detailed information regarding the mechanical properties and allowable conductor cross sections for the CAN counter connector.

Mechanical properties	
Stripping length	7 mm
Tightening torque	0.22 .. 0.25 Nm
Connection data	
Conductor cross-section solid min.	0.14 mm ² (26AWG)
Conductor cross section solid max.	1.5 mm ² (15AWG)
Conductor cross section flexible min.	0.14 mm ² (24AWG)
Conductor cross section flexible max.	1.5 mm ² (15AWG)
Conductor cross section flexible, ferrule with plastic sleeve min.	0.25 mm ² (23AWG)
Conductor cross section flexible, ferrule with plastic sleeve max.	0.5 mm ² (20AWG)

Table 7 Mechanical properties and allowable conductor cross section of CAN counter connector

7.4 Nest-2800W I/O connector and wiring

Mechanical properties	
Stripping length	7 mm
Tightening torque	0.22 .. 0.25 Nm
Connection data	
Conductor cross-section solid min.	0.14 mm ² (26AWG)
Conductor cross section solid max.	1.5 mm ² (15AWG)
Conductor cross section flexible min.	0.14 mm ² (24AWG)
Conductor cross section flexible max.	1.5 mm ² (15AWG)
Conductor cross section flexible, ferrule with plastic sleeve min.	0.25 mm ² (23AWG)
Conductor cross section flexible, ferrule with plastic sleeve max.	0.5 mm ² (20AWG)

Table 8 Mechanical properties and allowable conductor cross section of I/O counter connector

7.5 IEC Protection classes

IEC protection classes according to IEC 61140		
buzzard40 nest	Class I product	
buzzard40 bird	Class III product	

Table 9 IEC protection classes according to IEC61140

8 Paralleling of buzzard modules

To achieve higher charging current, paralleling of buzzard modules is supported.

8.1 Electrical power connection of Nest-2800W

Please connect each Nest-2800W to the grid.

8.2 Electrical power connection of Birds

⚠ The bird devices should be connected with individual wiring to the battery or to a collection rig as illustrated in Figure 8-1.

⚠ Each device should have an individual fuse 50AT.

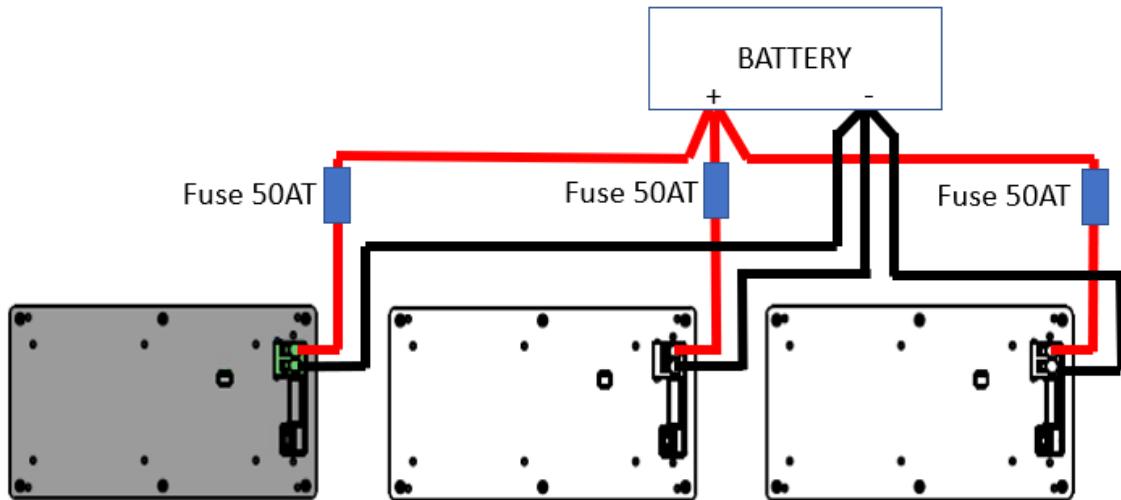


Figure 8-1: Parallel connection of Birds

8.3 Hardware enabling of the Birds

Each Bird must be individually enabled by his "ENABLE IN" pin.

8.3.1 Using external 24V power supply

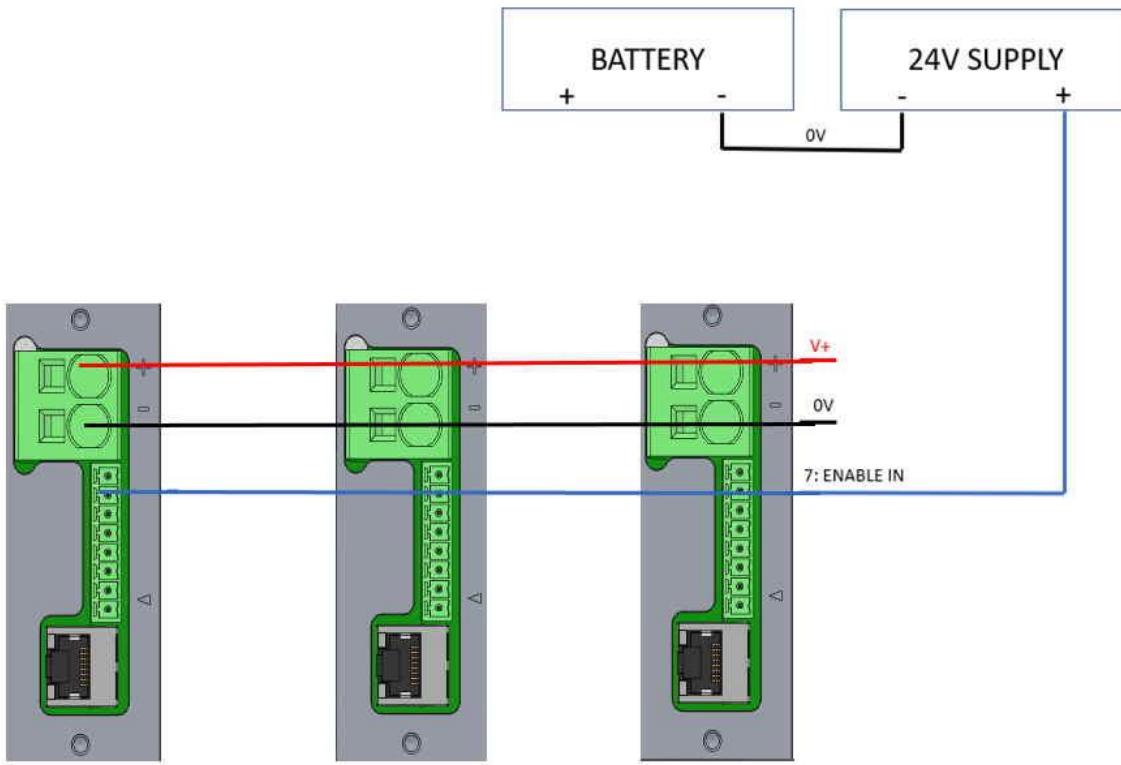


Figure 8-2 : Parallel connection of ENABLE IN using external 24V power supply

8.3.2 Using ENABLE OUT output

The ENABLE OUT signal is internally derived from V+. Only use **one** ENABLE OUT signal to drive the ENABLE IN signals as shown in Figure 8-3 : Parallel connection of ENABLE IN using ENABLE OUT.

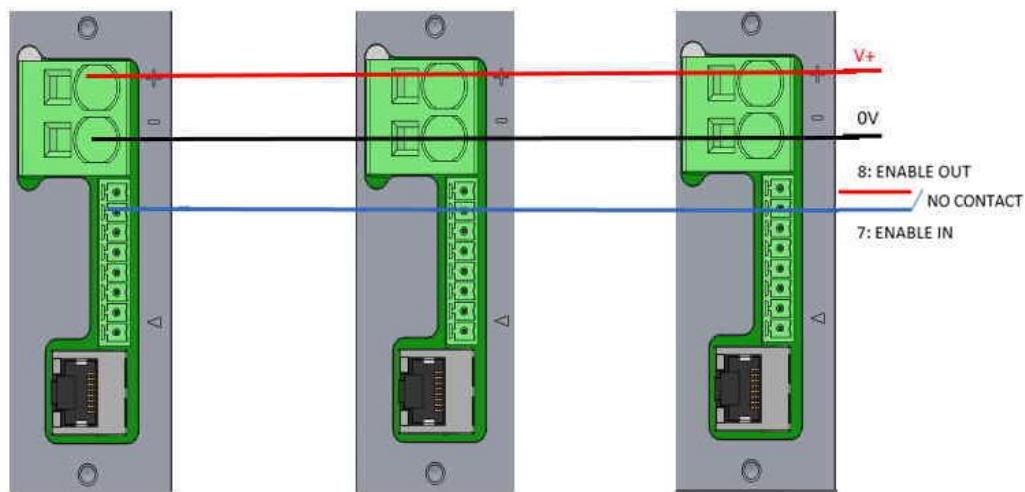


Figure 8-3 : Parallel connection of ENABLE IN using ENABLE OUT

8.3.3 Spacing between parts of a paralleled system

Please make sure that the minimum mounting distance is respected as depicted in Figure 8-4, Figure 8-5 and Figure 8-6.

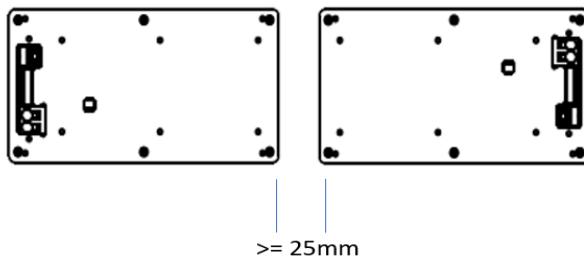


Figure 8-4 : minimum in line spacing between pads

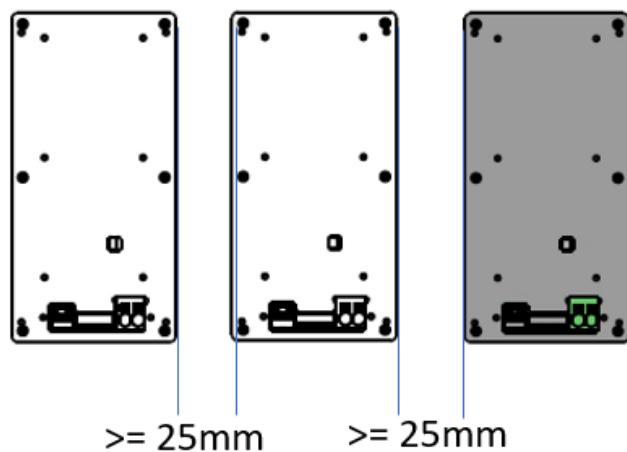


Figure 8-5 : minimum adjacent spacing between pads

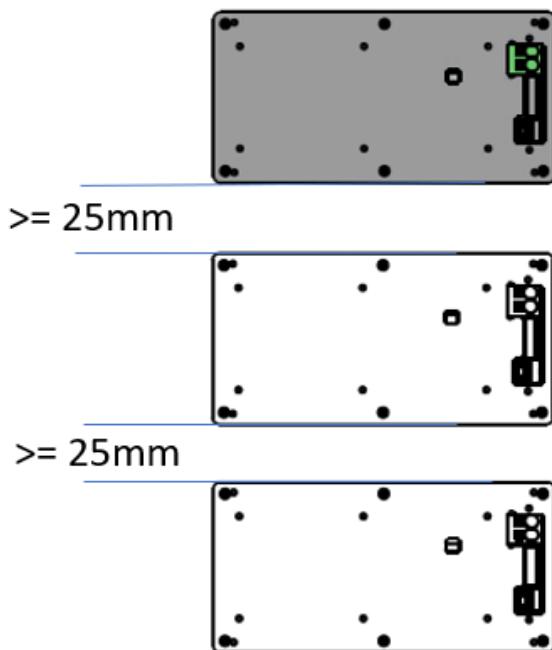


Figure 8-6: minimum vertical spacing between pads

9 Safety instructions - cautions

9.1 Electrical

Please be aware of the following important cautionary messages for the safe operation of the device:

⚠ Risk of Fire. Use only on circuits provided with 16 A branch circuit protection, in the USA in accordance with the National Electrical Code, NFPA 70. This device should only be used with electrical circuits that have the appropriate branch circuit protection. Failure to comply with this requirement may pose a fire risk.

⚠ Risk of electric shock. Do not touch uninsulated battery terminals. It is important to avoid contact with any exposed or uninsulated battery terminals to prevent the risk of electric shock. Always exercise caution and ensure proper insulation when handling battery-related components.

To avoid the risk of electric shock, do not touch any parts of the *Nest-2800W* and *Nest-40A* *until* the mains supply has been disconnected and allowed to discharge for at least 60 seconds. This allows for the safe discharge of any stored electrical energy.

⚠ Device with high leakage/touch current in case of failure of the protective earth wire. Connect the protective earth wire to the indicated screw. This device is designed with high leakage/touch current in the event of a failure of the protective earth wire. To maintain the safety of the device and prevent the risk of electric shock, it is crucial to correctly connect the protective earth wire to the designated screw as indicated. This ensures proper grounding and minimizes any potential hazards.

9.2 Heat

Please take note of the following cautionary messages for the proper use and handling of the device:

⚠ Suitable for mounting on concrete or non-combustible surfaces only. This device is designed for installation on concrete or non-combustible surfaces. Ensure that it is mounted only on these types of surfaces to prevent any potential fire hazards.

⚠ Front covers and parts of the modules can have elevated temperatures. After operation, the front covers and certain parts of the modules may have elevated temperatures. To avoid the risk of burns or injury, refrain from touching the front of the modules for a period of 5 minutes after operation. Allow sufficient time for the modules to cool down before handling.

9.3 Electromagnetic field

The product has been designed to meet the 1999/519/EC & 2013/35/EU legislation and recommendations under the following conditions:

⚠ Ensure that the general public is kept at a minimum distance of 25 cm from the product in all directions. Additionally, the 5 cm volume surrounding the *Nest* and *Bird* modules should be treated as a hazardous area during operation.

⚠ The integrator is responsible for setting up the modules in a manner that provides a safe distance for the general public as specified in Figure 9-1.

To comply with a safe mode of operation where foreign objects are prohibited from coming close to the airgap, consider the following options:

- Clearly mark the area surrounding the *Nest-40A* module as a 'keep-out area' to indicate that no one should come within a specified distance.
- Using barriers that block access to a distance of 5 cm. Install physical barriers or enclosures that prevent anyone from coming closer than 5 cm to the *Nest* and *Bird* modules during operation.
- Floor marking that indicates the keep-out area during operation. Use floor markings or signage to clearly define the boundary of the keep-out area and alert individuals to maintain a safe distance.

Please ensure strict adherence to these cautionary messages to ensure the safety of individuals and compliance with regulatory requirements.

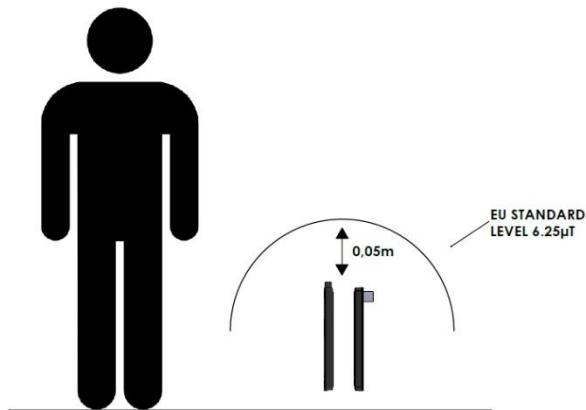


Figure 9-1 Keep out area

9.4 Mounting

Please pay attention to the following instructions:

⚠ The installer shall mount the *Nest-2800W* on the wall in such a way as to prevent the product from falling.

⚠ The installer shall use metal screws to mount the *Bird*. The use of metal screws is important for establishing reliable electrical contact between the enclosure of the product and the chassis of the vehicle.

10 Derating

10.1 Nest heating and derating

Heating considerations for the *Nest-2800W* and *Nest-40A* are influenced by several factors:

1. The proper alignment and close proximity between the *Bird* and *Nest-40A* contribute to heat reduction.
In cases where there is too large of an airgap or poor alignment, the system detects potential issues and stops generating power.
2. Grid voltage: When operating the system from a 120V grid, the heating may be more pronounced compared to operating from a higher voltage grid. This is particularly relevant if the system has a power rating of 1.5kW.
Derating of output power is implemented to manage heating issues. To limit the input power of the *Nest-2800W* to its rated input power, the system can reduce the output power.

10.2 Bird heating and derating

Heating considerations for the *Bird* depend mainly on the output current of the *Bird*.

Derating of output power is implemented to manage heating issues. If derating alone is not sufficient to address the heating issue, it may result in an overtemperature fault condition, which will stop the system.

Derating of the output current can also be dependent on the airgap in the system. When airgaps are less than 15mm, derating based on airgap may occur.

11 Maintenance

When mounted in the proper environment as specified, the device is maintenance free.

12 FCC compliance statement

- This device complies with part 15 and 18 of the FCC Rules under the following conditions: Installation is restricted to industrial, scientific and commercial use only.
- This device complies with FCC radiation exposure limits according to 47 CFR 1.1307 clause (b)(1)(i)(B), when it is operated with minimum distance of 20 cm between a pad and your body.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

13 Warranty

Multipowr provides a one-year warranty as from the date of delivery as indicated on the invoice or shipping documents.

The warranty is only provided for the benefit of a professional buyer that can demonstrate to have purchased the relevant product from Multipowr.

The warranty is limited to the product's compliance with the relevant product specifications and documentation, as provided by Multipowr. In particular, issues of interoperability are excluded from warranty.

The warranty becomes null and void:

- When the product is used outside of the specification range, as specified in the manual.
- Upon unauthorized or faulty use.
- If the product has been tampered with in any way, including in particular any removal of the cover.

buzzard
by multipowr

www.multipowr.com