



Stemy device information

Testing protocol and Stemy Devices

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1. Testing protocol for Stemy devices

Testing protocol of each type of device.

1. **All devices are properly calibrated** → Stemy Devices measure power consumption and its calibration ensures that the measurements are correct and avoids short- and long-term failures.
2. **Functionality check with and without connectivity and with mains failure** → Stemy devices require internet connection, but if this connection is interrupted, we ensure that the device continues to operate as usual through a local control. In case the Stemy Device runs out of power, we make sure that the technology controlled (e.g. immersion heater) does not suffer any damage.
3. **Verify extreme conditions** → Stemy Devices are connected to the power supply; it is therefore necessary to expose them to the maximum loads they can withstand to avoid failures once they are installed. Extreme conditions are verified for 8 hours, putting the device at maximum power, verifying temperatures with thermal camera, and maximum voltage ratings. Additionally, Stemy Devices are encapsulated in a V0 self-extinguishing plastic enclosure, which self-contains the fire inside the device in case of fire.
4. **Verify in beta tester for months** → All Stemy Devices are tested in a real environment before being shipped to each customer. An exhaustive testing protocol is carried out simulating the daily use to which the device would be exposed. The necessary adjustments and improvements are made to maintain the proper functioning of the devices and improve their operability.

Electric Vehicle

Charging Post (EVCP):

2. ANDERSON-BOX



170x115x60mm.

The Anderson Box is an on/off controller for EVCPs or for EVs, including plug-in hybrids, that are charged using a conventional electrical plug socket.

'What does it do?'

The Anderson Box measures the charging power of your EVCP. If you charge your EV or plug-in hybrid using a conventional electrical plug socket, Stemy will provide additional cables to connect the Anderson-Box to the socket.

The Anderson Box can communicate with the Flex Community via Wi-Fi.

'Why do I need it?'

It will enable the Flex Community to both **optimize the electrical consumption of your EVCP**, or the conventional socket that you use to charge your EV/hybrid, by remotely controlling its use, and **offer flexibility to the local grid** by switching the EVCP/socket off when the grid is operating at high capacity i.e. there is high electricity demand across the network.

'Where will it go?'

The Stemy appointed electrician will install the Anderson Box between the incoming main electricity supply and the EVCP, or, between the conventional socket and the charger of your car.

'Can I control it?'

The Anderson Box can be controlled by you and it has 3 operating modes:

- **ON:** In this mode, you will use your EV charging post as you usually do.
- **MANUAL:** In this mode, you will be able to program the charging periods of your EV at any time of the day or night;
- **AUTO:** In this mode, the Anderson Box will optimize the charging of your EV by responding to non-market signals i.e. when there is plenty of renewable generation on the grid; and market signals i.e. when the grid is operating a high capacity and flexibility is required, without compromising your transport needs.

Air-Air Heat Pump:

3. CARRIER-INTESIS

The *Carrier-Intesis* is an on/off controller for an air-air heat pump.



90x36x58mm.



81x78x28mm

'What does it do?'

The Carrier-Intesis measures and controls the temperature of your home and along with the Ampere (see below) the amount of electricity consumed by the heat pump.

'Why do I need it?'

It will enable the Flex Community to both **optimize the electrical consumption of your heat pump** by remotely controlling its use, and **offer flexibility to the local grid** by switching the heat pump off when the grid is operating at high capacity i.e. there is high electricity demand across the network.

'Where will it go?'

The Stemy appointed electrician will install the Carrier next to the router and the Intesis devices next to the AC indoor unit.

'Can I control it?'

The Carrier-Intesis can be controlled by you, and it has 3 operating modes:

- **ON:** In this mode, you will use your HP as you usually do.
- **MANUAL:** In this mode, you will be able to program the temperature comfort levels of your home at any time of the week.
- **AUTO:** In this mode, the Carrier-Intesis will optimise the operating periods of your HP by responding to non-market signals i.e. when there is plenty of renewable generation on the grid; and market signals i.e. when the grid is operating a high capacity and flexibility is required, without compromising your heating needs.

Air-Water Heat Pump:

4. MAXWELL



90x36x58mm.

The *Maxwell* is an on/off controller for an air-water heat pump

'What does it do?'

The Maxwell measures and controls the temperature of your home as well as the usage of domestic hot water (DHW), and along with the Ampere (see below) the amount of electricity consumed by the heat pump.

'Why do I need it?'

It will enable the Flex Community to both **optimize the electrical consumption of your heat pump** by remotely controlling its use, and **offer flexibility to the local grid** by switching the heat pump off when the grid is operating at high capacity i.e. there is high electricity demand across the network.

'Where will it go?'

The Stemy appointed electrician will install the Maxwell within 2 meters of the compressor of the heat pump.

'Can I control it?'

The Maxwell can be controlled by you, and it has 3 operating modes:

- **ON:** In this mode, you will use your HP as you usually do.
- **MANUAL:** In this mode, you will be able to program the temperature comfort levels of your home at any time of the week.
- **AUTO:** In this mode, the Maxwell will optimize the operating periods of your HP by responding to non-market signals i.e. when there is plenty of renewable generation on the grid; and market signals i.e. when the grid is operating a high capacity and flexibility is required, without compromising your heating needs.

Sensor and control unit

5. AMPERE



90x36x58mm.

The Ampere Sensors are electrical signal analyzers. The Ampere Control Unit is a gateway to connect the sensors to the Flex Community.

'What does it do?'

The Ampere Sensors analyze the electricity consumed by your home. The Ampere control unit can communicate with the Flex Community via Wi-Fi.

'Why do I need it?'

It will enable the Flex Community to both **optimize the electrical consumption of your energy equipment** by remotely controlling its use, and **offer flexibility to the local grid** by switching the energy equipment off when the grid is operating at high capacity i.e. there is high electricity demand across the network.

'Where will it go?'

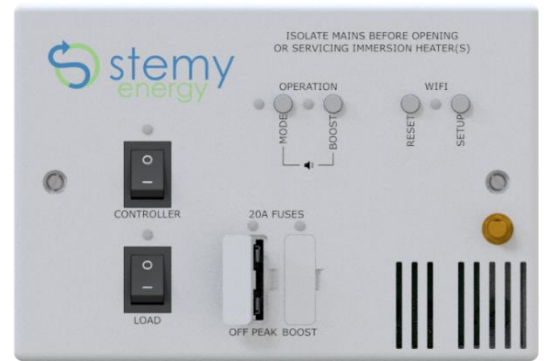
The Stemy appointed electrician will install the Ampere Sensors and Control Unit in your consumer unit in spare ways.

'Can I control it?'

There is no control function.

Domestic Hot Water:

6. WADDY-BOX



The Waddy Box is a controller for your immersion heater.

170x115x60mm

'What does it do?'

The Waddy Box measures the power consumption of your immersion heater and estimates the hot water demand. Waddy Box can communicate with the FlexCommunity via Wi-Fi.

'Why do I need it?'

It will enable the Flex Community to both **optimize the electrical consumption of your domestic hot water** by remotely controlling its use and **offer flexibility to the local grid**.

'Where will it go?'

The Stemy appointed electrician will install the Waddy Box close to your hot water cylinder.

'Can I control it?'

The Waddy Box can be controlled by you, and it has 3 operating modes:

- **ON:** In this mode, you will use your immersion heater as you usually do.
- **MANUAL:** In this mode, you will be able to program the operating Periods of your immersion heater at any time of the day or night.
- **AUTO:** In this mode, the Waddy Box will optimize the operating periods of your immersion heater by responding to non-market signals i.e. when there is plenty of renewable generation on the grid; and market signals i.e. when the grid is operating a high capacity and flexibility is required, without compromising your hot water needs.

PV & Batteries:

7. VOLTA

*The **Volta** is a control device for the management of the power generated by PV panels and the energy stored in batteries.*



90x36x58mm.

'What does it do?'

The Volta manages the charge and the discharge of the battery, optimizing its performance all the time, while considering user comfort. Volta can communicate with the FlexCommunity via Wi-Fi.

'Why do I need it?'

It will enable the Flex Community to both **optimize your solar generation** by remotely controlling its battery storage and **offer flexibility to the local grid**.

'Where will it go?'

The Stemy appointed electrician will install the Volta next to the router.

'Can I control it?'

There is no control function, the Volta will automatically control the battery to adjust to the market demands without compromising your energy requirements.

Climate:

8. WATT-F

The Watt F is a smart plug device designed to control electric radiators.



68x68x34mm.

'What does it do?'

The Watt F allows to manage room temperature while constantly optimizing energy performance and user comfort. Volta can communicate with the FlexCommunity via Wi-Fi.

'Why do I need it?'

It will enable the Flex Community to both **optimize the electric consumption of your radiators** and **offer flexibility to the local grid**.

'Where will it go?'

The Stemy appointed electrician will install the Watt F in a Schuko type plug.

'Can I control it?'

The Watt F can be controlled by you, and it has 3 operating modes:

- **ON:** In this mode, you will use your radiator as you usually do.
- **MANUAL** In this mode, you will be able to program the temperature comfort levels of your home at any time of the week.
- **AUTO:** In this mode, the Watt F will optimize the operating periods of your radiators by responding to non-market signals i.e. when there is plenty of renewable generation on the grid; and market signals i.e. when the grid is operating a high capacity and flexibility is required, without compromising your temperature comfort.