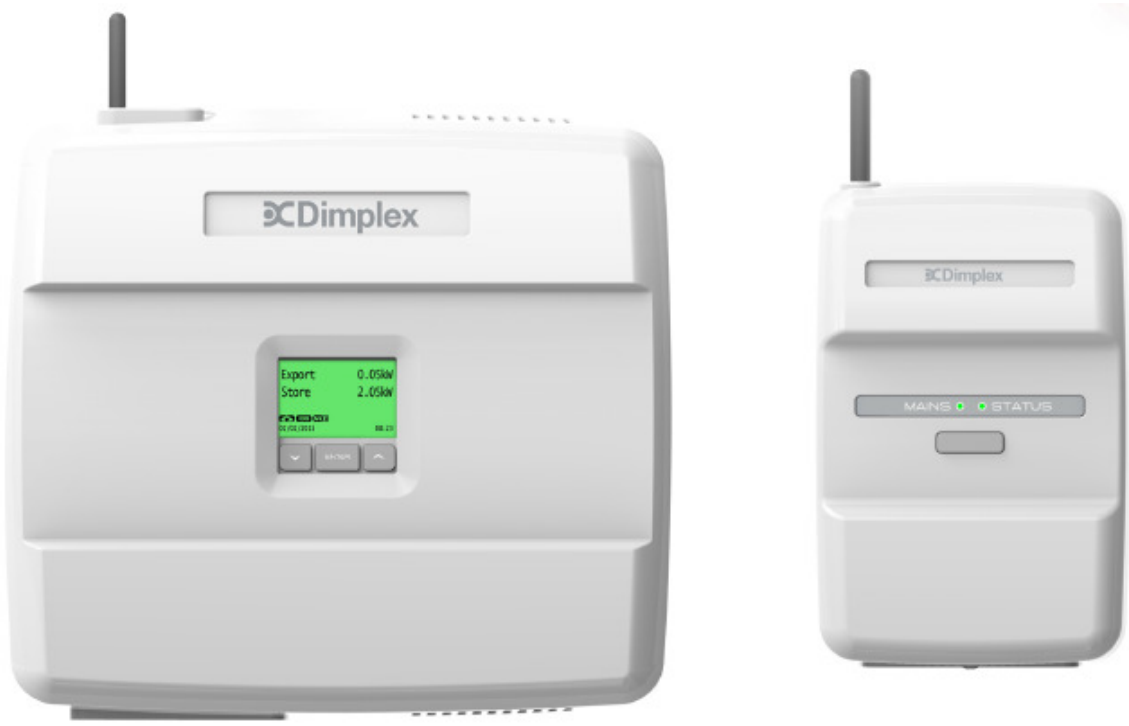
Free-E



Dimplex®

Free-E User Manual

Heat water for free with solar PV.

8/60510/0 Version 1.0

dimplex.co.uk/Free-E

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Contents

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1. Manual Information

Warnings and Icons Used

Electrical Warnings
Indicates any hazard of an electrical nature.

General Warnings
Indicates a general warning against actions which could result in damage to the system or personal injury to the installer and/or user.

Information
Indicates tips and advice for the smooth operation of the system.

THIS MANUAL REFERS TO THE FOLLOWING PRODUCTS;
Free-E Meter (certified as part number: 054722)
Free-E (certified as part number: 056849)

Retain This Manual For Information

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2. Safety Information

2.1 Legionella Warning

Legionella bacteria can be found in natural water sources in low concentrations. At this level it will not pose a risk to human health, however the nature of domestic hot water storage tanks or boilers may allow the bacteria to reproduce if the water is left stagnant for a long time.

Under normal circumstances, the frequent use of the hot water tank will protect against the growth of bacteria, however if the tank will be left unused for a prolonged period, for example, if you are going on holiday, it is highly recommended to ensure that any boiler controls are set to heat the water to 60°C+ at least once per week to protect against Legionella.

2.2 General Safety Guidelines

This appliance is not intended for use 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 regarding the use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

The Free-E has a software generated alarm which prevents it from running when an error has occurred.

2.3 General Maintenance Guidelines

Regular maintenance of the Free-E ensures a long operating life and optimal efficiency.
The Free-E fan and ventilation grids should be cleaned periodically using a vacuum cleaner.

The following procedure should be followed;
- Disconnect the Free-E on the AC side
- Wait 5 minutes until the residual voltage has been drained and the fan is no longer turning
- Gently clean the top and bottom ventilation grids with a vacuum cleaner

2.4 Electrical Safety Guidelines

When using electrical devices, there is always a risk of fire or explosion.
To prevent this from occurring please ensure that;
- The Free-E system is not installed close to any flammable materials
- The Free-E system is not installed in any areas with potential for explosion.

2.5 Legal

The construction and design of the Free-E complies with all relevant EU directives.

2.6 Intended Use

This product is designed to redistribute energy generated by a PV system to an immersion heater, that would otherwise have been exported to the grid, and is intended for domestic and light commercial use only. Any other use beyond that intended by the manufacturer is prohibited. This requires the user to abide by the manufacturer's product information. Please refrain from tampering with or altering the device.

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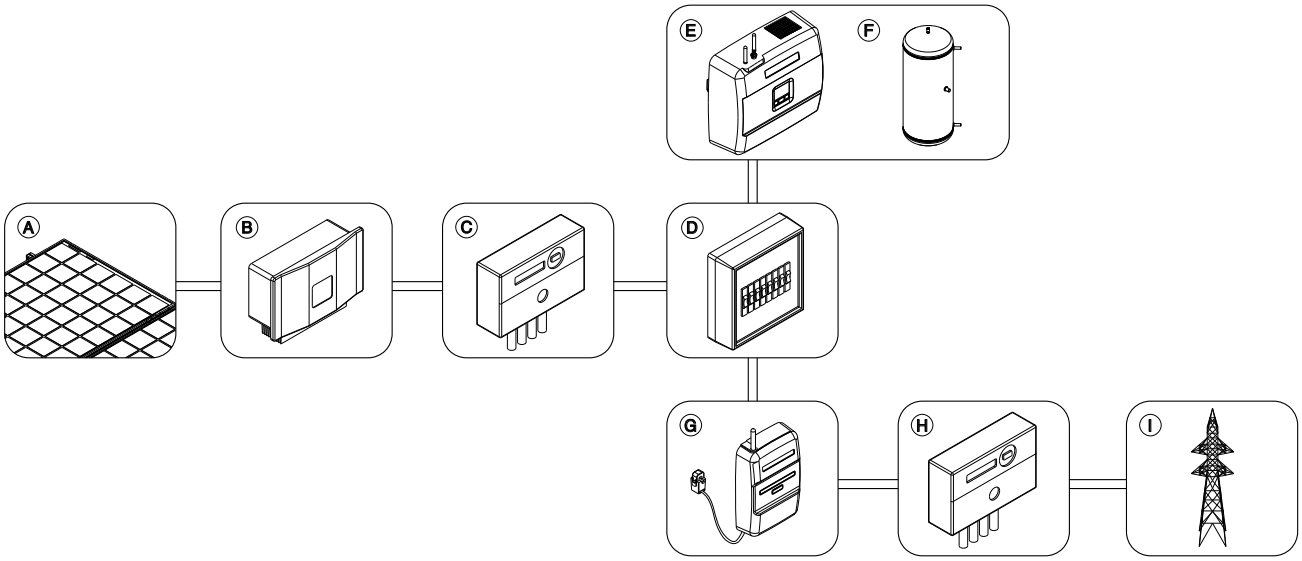
3. Free-E Overview - How it Works

When PV panels generate electricity, the production is initially consumed by electrical appliances or devices in the household that are creating a demand for energy. If the household does not consume all of the energy produced by the PV panels, the surplus energy will be sent to the grid.

The Free-E uses this surplus photovoltaic energy instead to heat the water in a household water tank, and therefore prevent this energy from going to waste. The Free-E is up to 98.2% efficient when using unused (otherwise exported) solar PV electricity to an electrical water heating device. This maximizes the consumption of self-generated solar power and minimizes the cost of buying energy for domestic hot water. It can be retrospectively fitted to homes already with solar PV and a hot water cylinder.



Position	Description
A	PV Panels
B	Inverter
C	PV Solar Electricity Meter
D	Distribution Box
E	Free-E
F	Domestic Hot Water Cylinder
G	Free-E Meter and CT Clamp(s)
H	Import / Export Electricity Meter
I	Grid

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3.1 Key Features

- Uses excess energy produced by your PV system to heat water.

- Monitors and adjusts the power imported and exported to the grid, ensuring that the exported power remains at virtually zero when the PV system is producing enough energy to cover the demand for domestic electricity and hot water.

- Monitors and adjusts the power imported and exported to the grid, ensuring that the exported power remains at virtually zero when the PV system is producing enoughy energy to cover the demand for domestic electricity and hot water.

- Timed boost function available, which can be set for multiple days of the week.

- Back-lit LCD display with different Light OFF times available, which displays information about the operating mode, settings and more.

- The current imported, exported and diverted power level can be viewed.

- Compatible with most existing immersion heaters and underfloor heating systems.

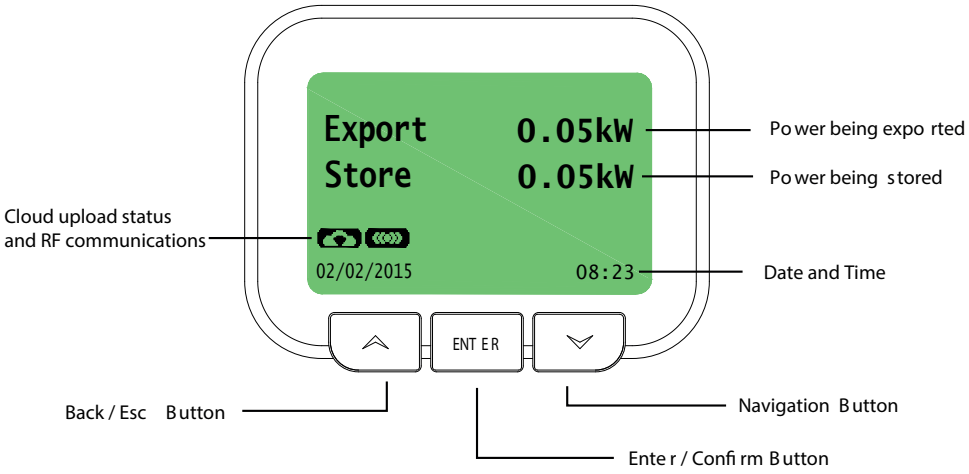
- Internal software alarm system, thermal protection, overload protection and soft start option - all of which prevent damage to the system and give you peace of mind.

- Approved CE product.

- 3 Year Warranty.

4. Using the Free-E Interface

The Free-E interface is controlled using the three buttons located below the screen, as shown below.



The enter button is used to access the ADVANCED SETTINGS menu from the MAIN MENU. It is also the confirmation button for selections made on the user interface. The left Back/Esc button is used to escape from menus or selections.

All navigation down through the menus on the user interface will be carried out by using the right Navigation button. This button allows scrolling down through the displayed options, and when the end of the menu is reached, continuing to press the button will return the user to the top of the menu.

The screen shown above in is the default screen saver on the Free-E user interface. It displays the current energy being diverted in watts, the percentage load diversion (percentage of electricity generated being sent to the domestic hot water cylinder from the Free-E), the current date and time, and icons for the connectivity status, which are;

RF Communication

Displays when the Free-E meter is communicating with the master module, over RF link.

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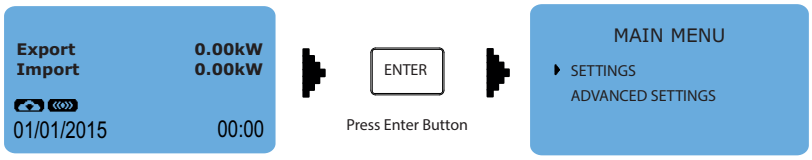
4.1 Main User Interface Screen and Colours

4.1.1 Backlight Colour Indications

If the Free-E is storing energy, the backlight will be green. If no energy is being stored, the backlight will be blue. If there is a fault or error with the operation of the Free-E, the backlight will be red.

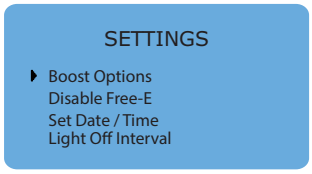
4.1.2 Main Menu

To access the main user menu, simply press the enter button when on the default screen saver as shown below. From the main menu, you will have access to the settings and advanced settings menus.



4.2 Settings Menu

The settings menu allows access to boost set-up options, disabling the Free-E device, date and time settings and light off interval settings.



4.2.1 Boost Options

The Free-E provides options for both a manual (ON/OFF) one-hour default boost, or for a timed boost, which can be set for three different timer periods, up to 7 days a week.

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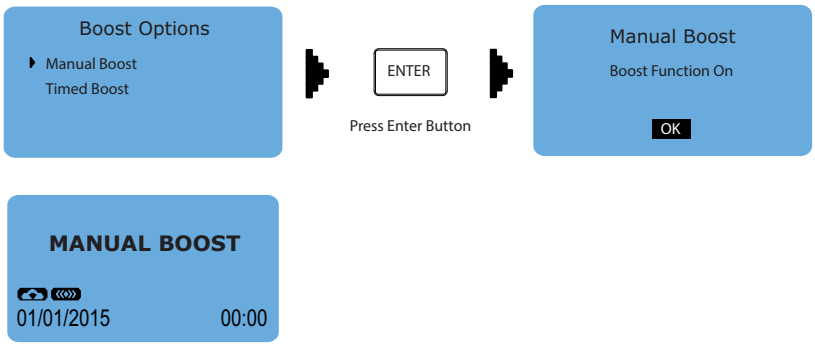
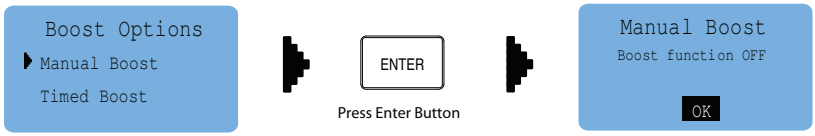
Manual Boost

To activate the manual boost, simply select *Boost Options,* then *Manual Boost.* You will see the confirmation screen as shown below when the manual boost is activated, and the default display screen will display the *Manual Boost* message shown below.



The manual boost is automatically set to run for a duration of one hour, however you can also deactivate it manually by returning to the *Boost Options* and selecting *Manual Boost* while the boost is still active. You will see a confirmation screen as shown below and the manual boost message will no longer appear on the default main screen.



Quick Steps for Using *Manual Boost*

Turning ON or OFF the *manual boost* can be carried out simply by pressing the *Enter* button 4 times

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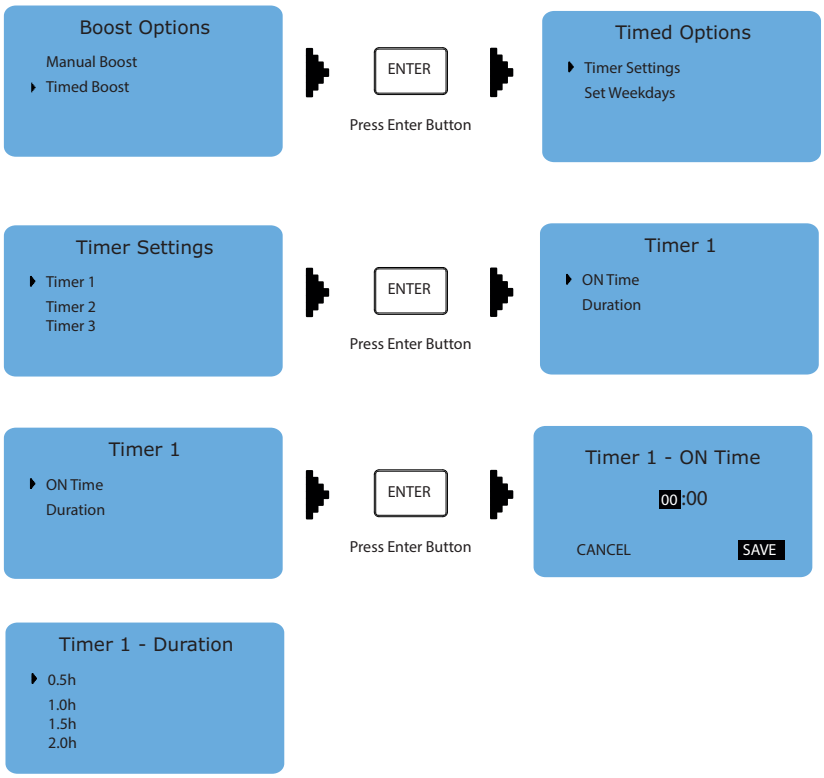
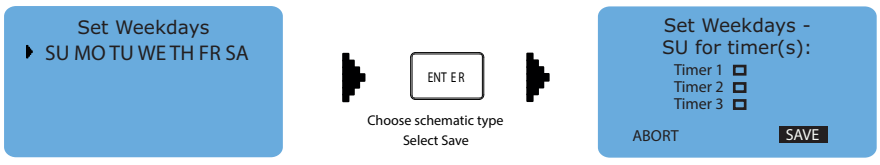
Timed Boost

The *Timed Boost* can be set for a specificed time for multiple weekdays. The timer should be set first using the Timer Settings menu, then the *Set Weekdays* menu allows you to select which of the three programmable boost timers will be activated for each weekday. You can set any combination of the three timers, for any or all weekdays.

Each timer must be assigned an ON time when set up, but you can also select the duration of the boost. The options for boost duration ranges from 30 minutes to 2 hours.



The Set Weekdays menu will let you scroll across between Sunday-Saturday (SU-SA), and on selecting each day, you will be brought to the menu for that day which will show a list of tick boxes for each timer that you can enable.



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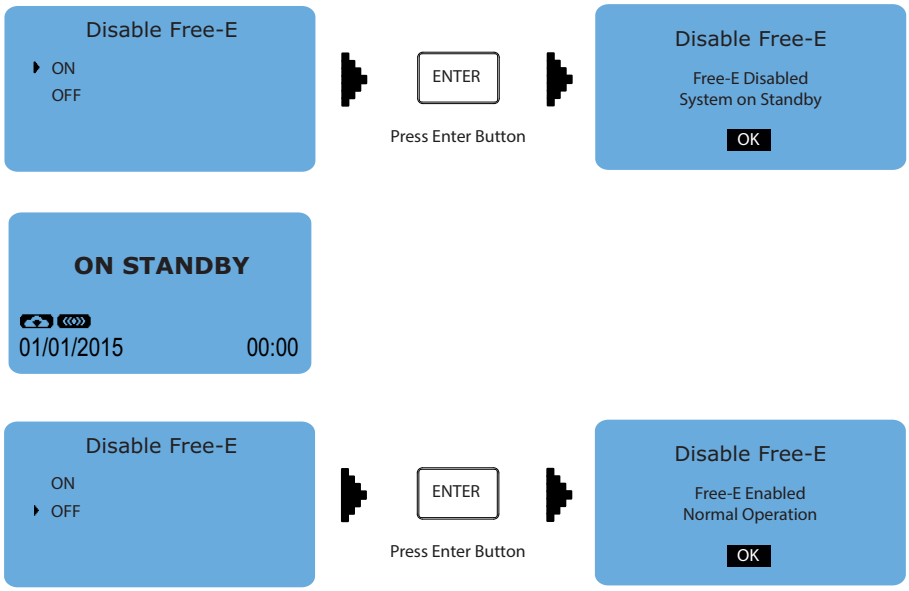
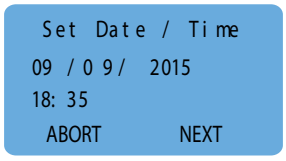
4.2.2 *Disable Free-E*



This option allows you to temporarily diasble the Free-E. If, for any reason, the Free-E needs to be turned off, do not disconnect the system from the mains supply. The *Disable Free-E* function is provided for this purpose, and is useful, for example, if you are going on holiday and would like to turn off the system while you are away. NOTE: If there is a power cut when the Free-E is disabled, the Free-E will remain disabled when the power comes up again. Selecting *Disable Free-E* ON will disable the system, and a message will appear on the main screen saver to indicate that the Free-E is on standby (see image above). During this time, the Free-E will not perform functions, however you will still have full access to all menus.

4.2.3 Set Date / Time



This option alows you to set the current date and time for the Free-E user interface. This function is important for the smooth operation of the boost timers and other data. Please ensure that the current date and time are set correctly.

4.2.4 *Light OFF Interval*

This option allows you to set the OFF time for the backlight of the Free-E user interface when not in use. The light OFF interval can be set to 1 minute, 30 minutes or never, which will prevent the backlight from turning off. The default setting is 30 seconds.

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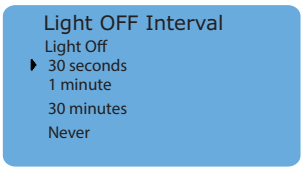
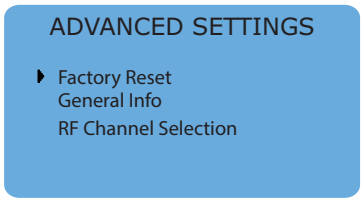


4.3 Advanced Settings



4.3.1 Factory Reset

The factroy reset funstion should only be used if strictly necessary, and should NEVER be carried out by anyone with knowledge of how to re-commission the system correctly. It is not possible to use the system without commissioning, and all commissioning settings will be cleared by a factory reset.

DO NOT FACTORY RESET THE FREE-E UNLESS YOU ARE QUALIFIED TO RE-COMMISSION IT!

Factory resetting the Free-E will remove all configurations and will not allow any functions to be carried out until the commissioning procedure is complete.

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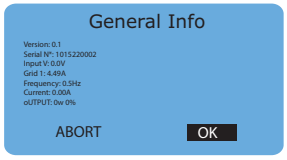
4.3.2 General Info

The General Info options allows you to access and view information such as the software version (Version), the device's serial number (Serial N*), the input voltage (Inout V), the grid current (Grid I), the supply frequency (Frequency), the device current being measured (Current) and the outut in watts (Output).



4.3.3 RF Channel Selection

The default RF channel is Channel 1 and will generally not need to be changed. If you experience interference, however, you can change this channel between channels 1-4 until the reception is clearer.

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5 Appendices

5.1 Free-E Meter Technical Specifications

Ordering Codes	DOEE	054722
Voltage / Current	Input Voltage Range	100V to 255V AC, 50/60Hz
	Voltage Accuracy	+/- 1%
	Voltage Resolution	0.1 Volt
	Current Measurement Range	0.1 to 80A
	Current Accuracy	1.6A~4A +/-1.5% 4A~ 80A +/-1%
	Current Resolution	0.01A
kWh, PF, kVAh	kWh Accuracy	+/- 1%
	kWh Resolution	0.01 kWh
	Power Factor Accuracy	+/- 1%
	Power Factor Resolution	0.01
	kVAh Accuracy	+/- 1%
	kVAh Resolution	0.01 kVAh
Certification	Certification	CE
	Metering Standard	Class 1 (Accuracy only)
Wireless Technology	Radio Technology	Dimplex GFSK
	Radio Frequency	868 MHz ISM Band
	Channels	4 Channels (1 - 4)
	Max Tx Power	+13dBm
	Rx Sensitivity	-105dBm@25Kbps
	Data Rate	up to 25 kbits/sec
Wireless Range	Indoor Range	up to 50m
	Outdoor Range	up to 300m (direct line of sight)
Rated input power	Power Consumption	1 Watt
Physical	Dimensions (LxWxH)	231 x 125 x 48 mm
	Weight	0.201 kg
	Mounting	Wall Mounting Flanges
	Enclosure	V0 Polycarbonate
	Operating Temperature	-20°C to +45°C
	Operating Humidity	up to 85% (non-condensing)

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5.2 Free-E Technical Specifications

Ordering Codes	DOMM	054739
Voltage / Current	Input Voltage Range	215V to 255Vac, 50/60Hz
	Maximum continuous AC output current at 210 V	14.2A +/-1%
	Maximum continuous AC output current at 230 V	13.0A +/-1%
	Maximum continuous AC output current at 254 V	11.8A +/-1%
	Maximum output over current protection	16A +/-1%
	Maximum input overvoltage protection	260 Vac
Electrical	Cooling concept	Forced Air Convection
	Relay output ratings	16A…... 250Vac
	Range of output power factor	0.9x … 1.0
	Nominal Power factor	0.99
	External Input voltage range	24 - 230Vac
	Peak Free-E efficiency	98.2%
Wireless Technology	Radio Technology	Dimplex GFSK
	Radio Frequency	868 MHz ISM Band
	Channels	4 Channels (1-4)
	Max Tx Power	+13dBm
	Rx Sensitivity	-105dBm@25Kbps
	WiFi	IEEE 802.11 b/g/n
Wireless Range	Indoor Range	up to 50m
	Outdoor Range	up to 300m (direct line of sight)
Standby Power	Power Consumption	10 Watt
Physical	Dimensions (LxWxH)	316 x 279 x 110 mm
	Weight	3.7kg
	Mounting	Wall Mounting Flanges
	Enclosure	V0 Polycarbonate
	Operating Temperature	-20°C to +45°C
	Operating Humidity	up to 85% (non-condensing)
Certifications	CE	Fully EMC Compliant

6 Consumer Information

NOTES

6.1 Compliance Information

The Dimplex Free-E complies with the applicable EU directives;

EC Directives:

Low voltage directive 2006/95/EC
EMC directive 2004/108/EC
Radio and Telecommunications Terminal Equipment Directive (1999/5/EC)
Restriction of Hazardous Substances Directive (2011/65/EU)
WEEE Directive

Applied Standards:

ISEN 55014-1: 2006 + A1:2009
ISEN 55014-2: 1997+ A1:2001 + A2:2008
ISEN 55022: 2010
ISEN 61000-3-2: 2006 + A1:2009 + A2:2009
ISEN 61000-3-3: 2008
ISEN 60335-1-2012

6.2 After Sales Service

Your product is guaranteed for 3 years from the date of purchase. Within this period we under-take to repair orreplace this product free of charge (subject to availability) provided it has been installed and operated in accordance with these instructions. Your rights under this guarantee are additional to your statutory rights, which in turn are not affected by this guarantee.

Should you require 24hr sales service you should contact our customer services help desk on 0844 879 3588. It would assist us if you can quote the model number, date of purchase and nature of fault at the time of your call. Please do not return a faulty product to us in the first instance, as this may result in loss or damage and delay in providing you with a satisfactory service.

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