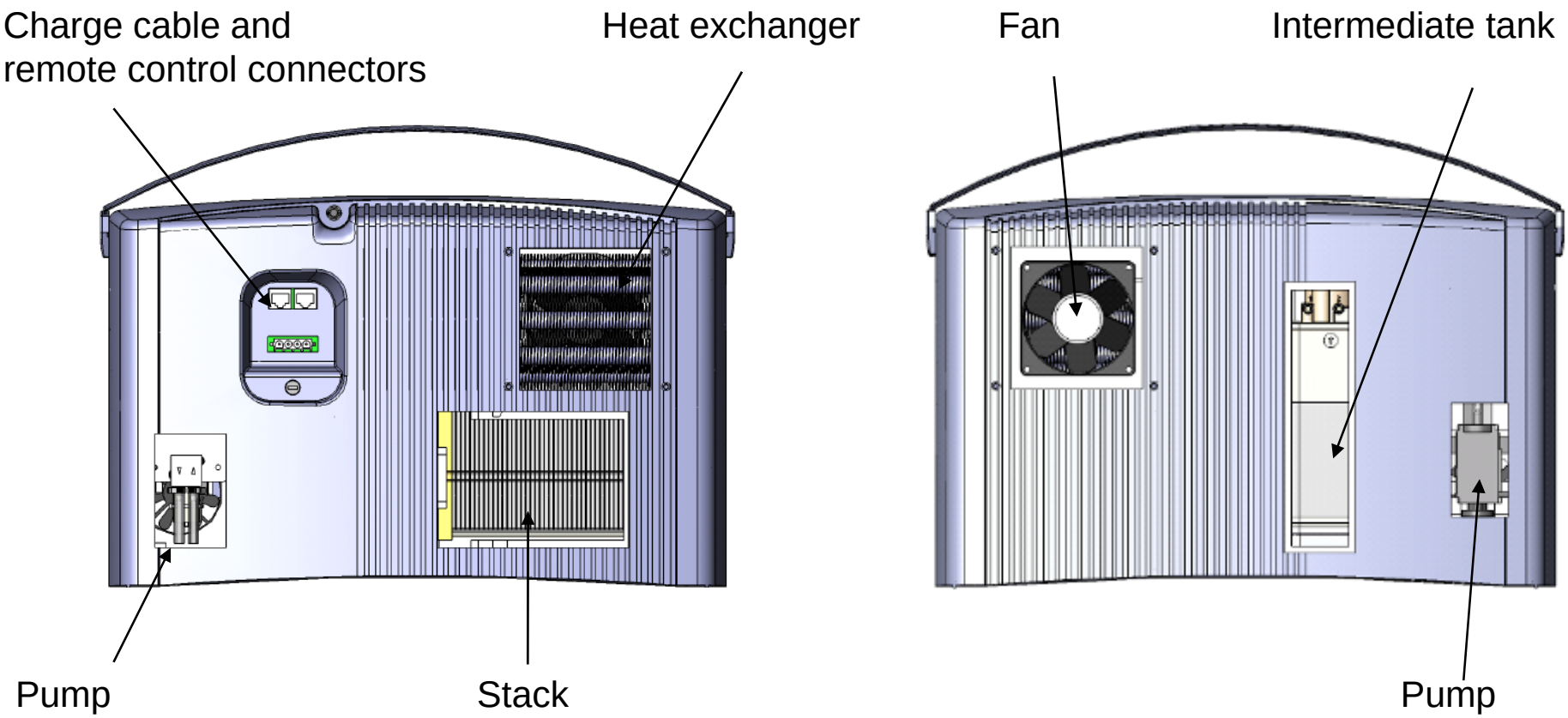
Product Training EFOY-Fuel Cells

Installation and Setting of the Operating Parameters

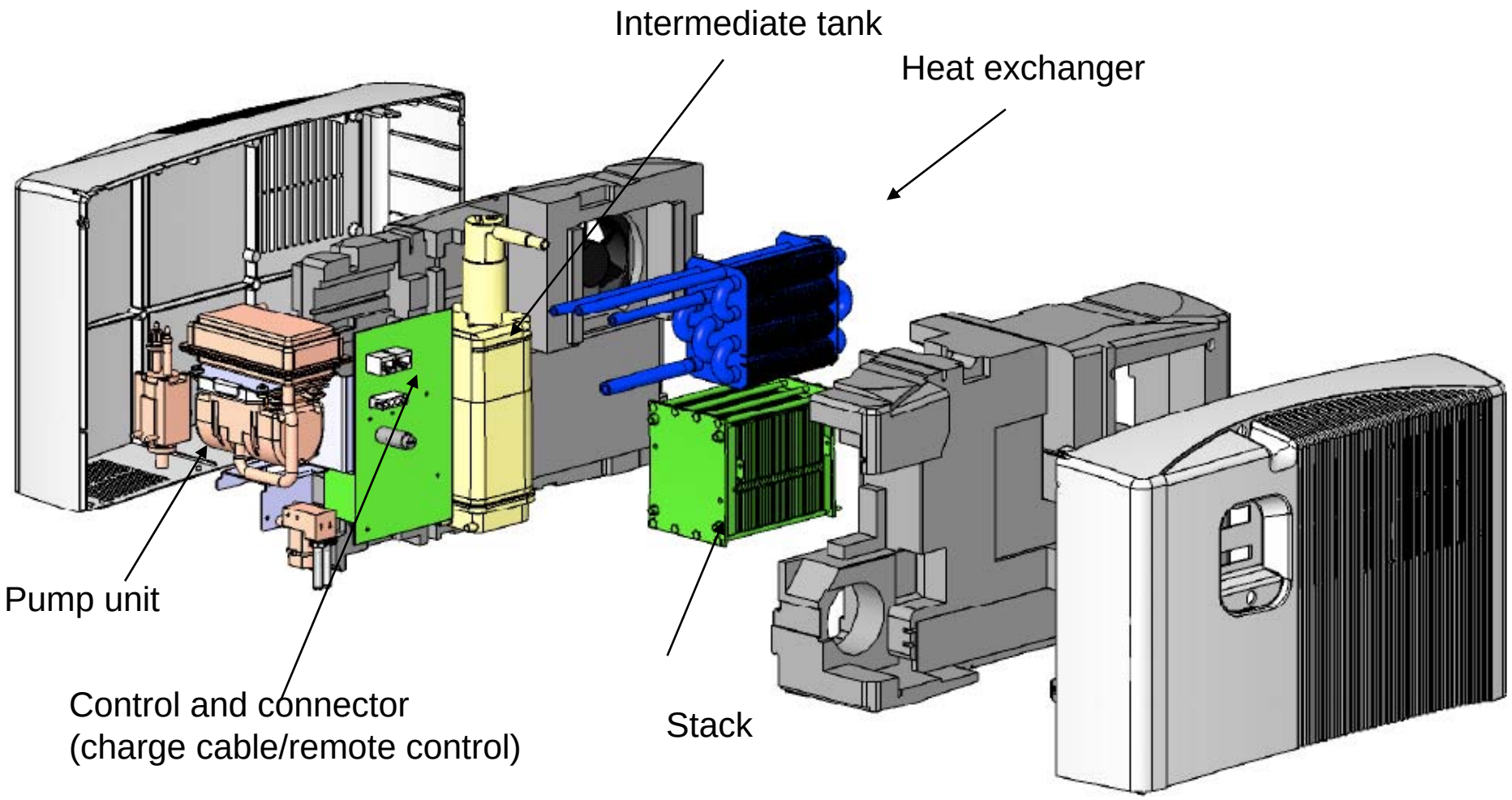
EFOY
ENERGY FOR YOU

Contents

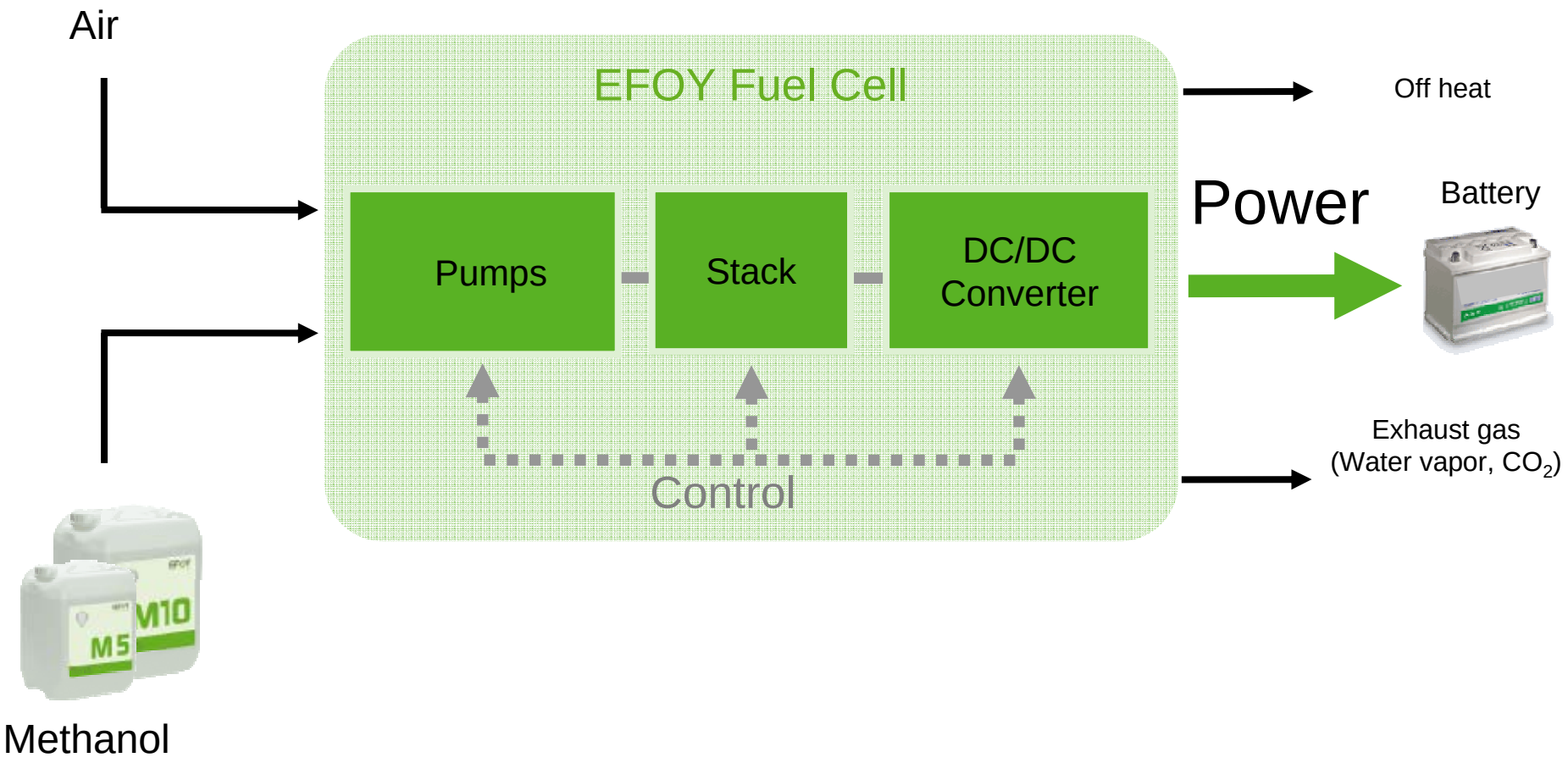
Cross Sectional View of the EFOY Fuel Cell



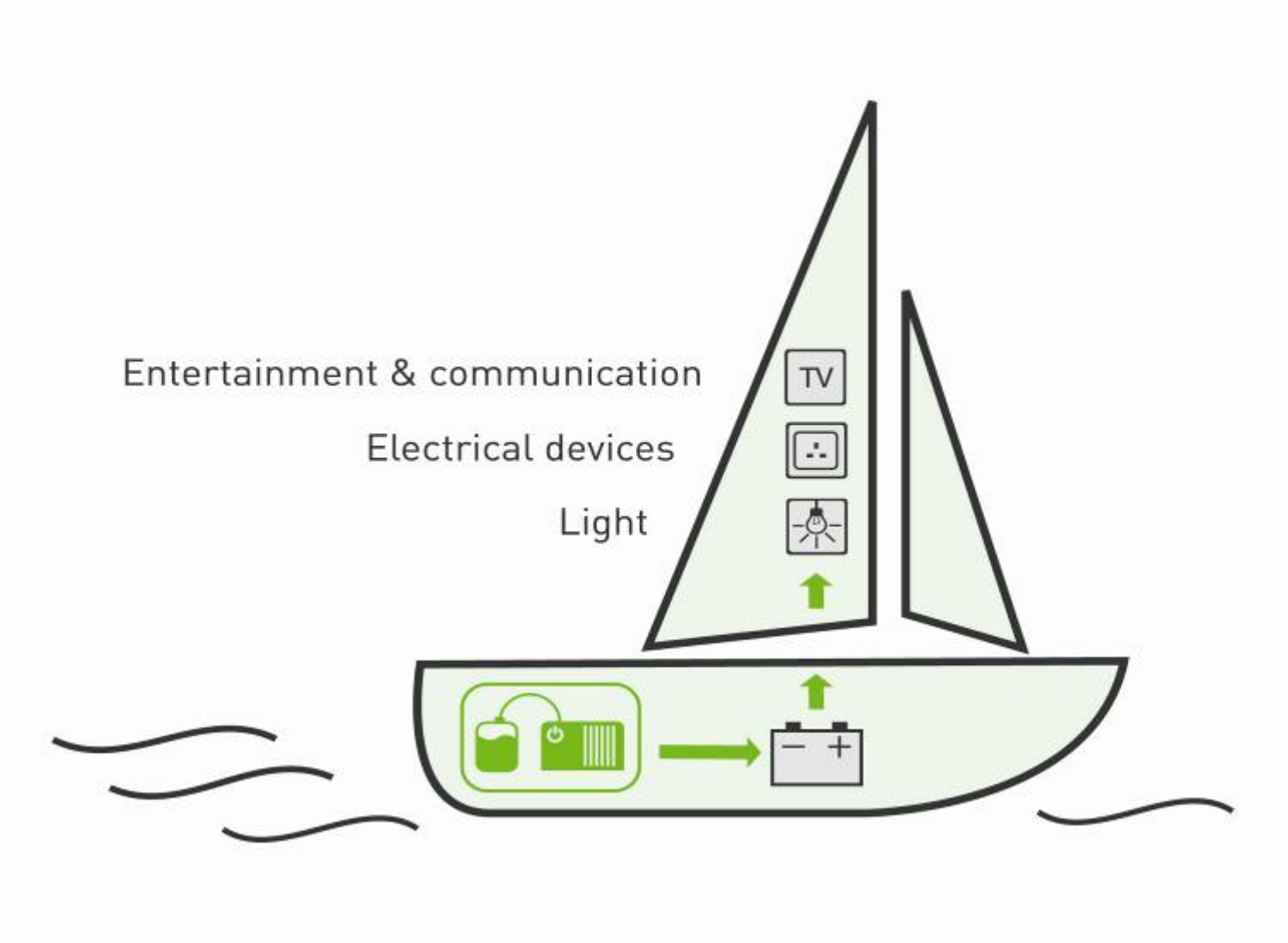
Cross Sectional View of the EFOY Fuel Cell



Operational Principle of the EFOY Fuel Cell



Electrical Consumers Devices in a Mobile Home



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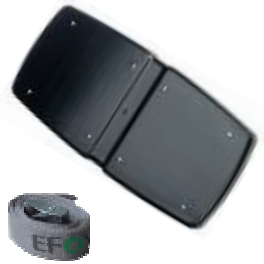
Standard Equipment

EFOY Fuel Cell

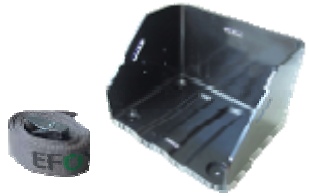
Remote control with data cable



Mounting plate with belt

User Manual

Set of cables



Fuel cartridge holder with belt

Service Kit

Off-heat duct set

Accessories

Extension sense line
(Length: 8 m)

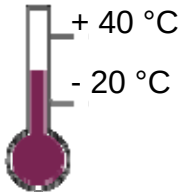
Extension power line
(Length: 8 m)

M5 Fuel cartridge

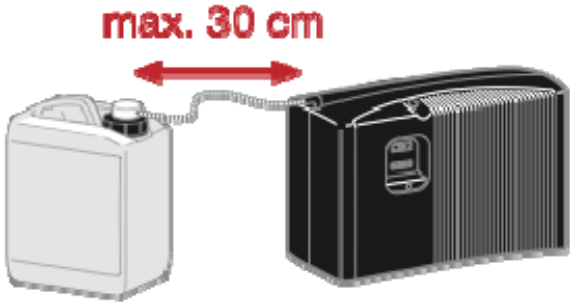
M10 Fuel cartridge

Contents

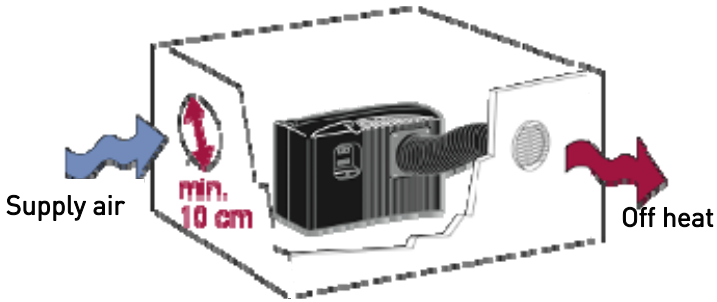
Notes on Choosing the Location



- Operating temperature range: -20 °C to + 40 °C

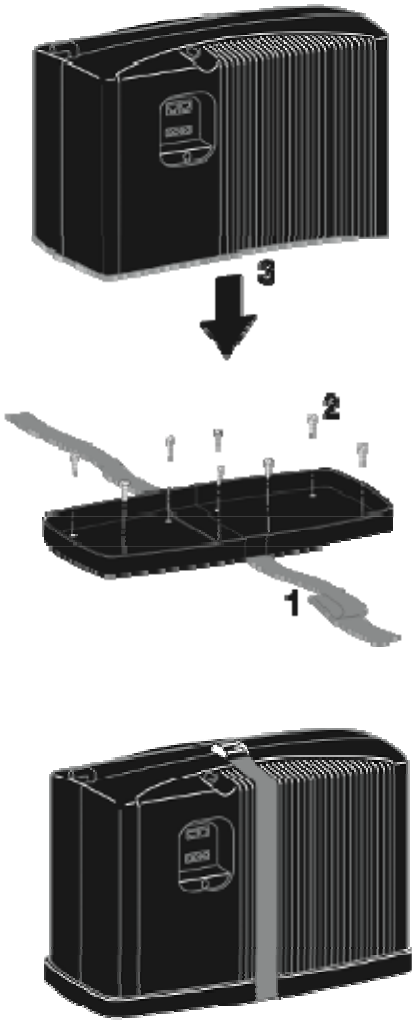


- Maximum distance between fuel cartridge and fuel cell: 30 cm



- Minimum lateral distance from the walls: 3 cm
- Make sure the supply air opening is big enough.
- Avoid exposure to sunlight and other sources of heat
- Off heat and exhaust gas are discharged from the installation space

Installation of the Unit



1. Belt for fastening the unit

2. Screws to fasten the mounting plate
   (screws are not included in the standard equipment)

3. Place the unit onto the mounting plate.

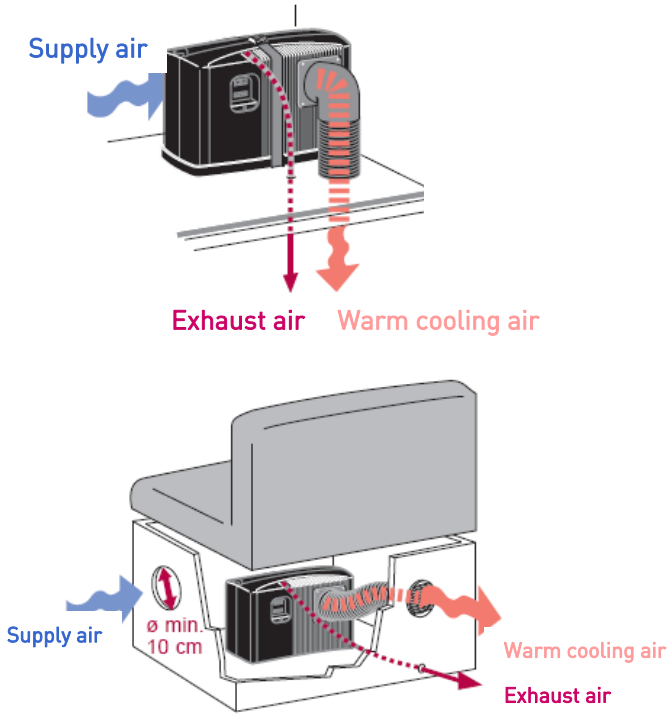
4. Strap the unit tightly to the mounting plate.

Note:

The unit should be mounted on a substrate thick enough to sustain the weight and absorb operational vibrations.

Supply and Exhaust Air Duct

1.



Supply Air

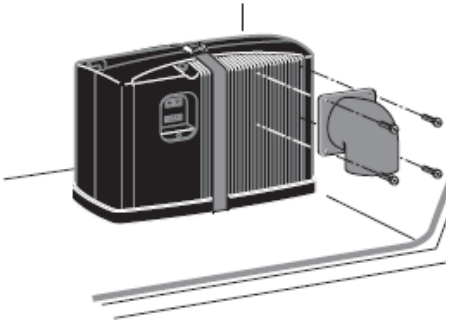
- Provide the installation space with an air inlet opening of at least 40 sq.cm in open cross section. Heavily structured openings (fine grid, small gaps) need to be wider.
- To ensure proper ventilation of the installation space the sucking side of the cooling fan should not be ducted.
- Minimum distance from the side wall: 3 cm

Off-Heat

- The off-heat must be removed from the installation space via a 100 mm tube. The outlet opening must have an open cross section of at least 40 cm^2. Heavily structured openings (fine grids, small gaps) need to be wider.

Installation of the Off-Heat Duct

2.



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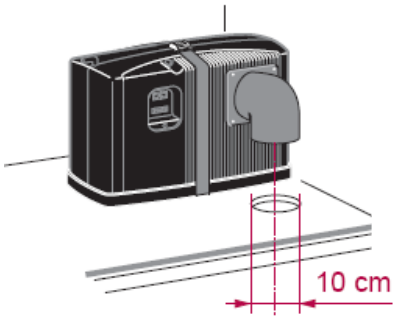
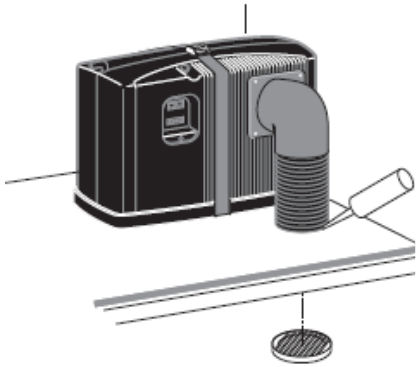


4.



Note:

All hoses should be installed the shortest possible way in as few bows as possible.

Avoid all possible flow obstacles (squeeze, kink, offset).

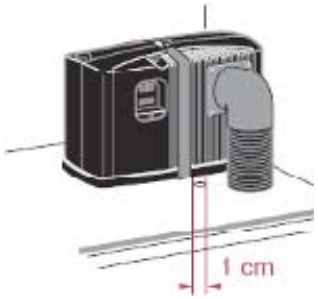
Installation of the Exhaust Gas Hose

up

down

Avoid siphoning

1.



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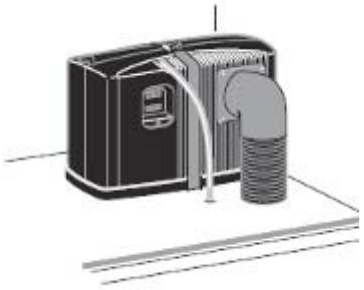
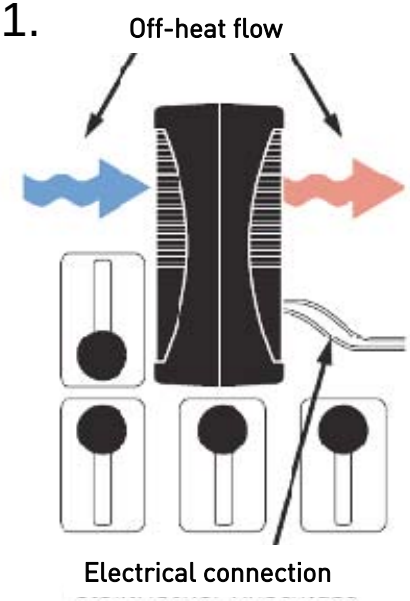


Exhaust Gas Hose

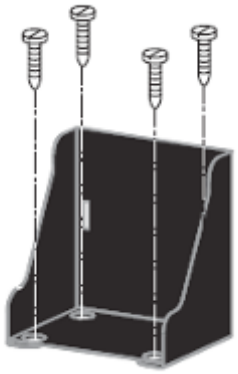
- Exhaust gas: Water vapor and CO_2
- Only use the exhaust gas tube supplied to route the exhaust gas from the installation space to the outside.
- Make sure the liquid components do not gather in the hose and may drop freely from the end of the hose.
- Make sure all hoses are installed the shortest possible way in as few bows as possible. Avoid all possible flow obstacles (squeeze, kink, offset).
- During winter operation (at a constant ambient temperature of less than 6°C) the exhaust gas hose should be shortened to a **maximum of 50 cm**. The end of the hose should be cut diagonally if the hose ends vertically.

Installation of the Fuel-Cartridge Holder

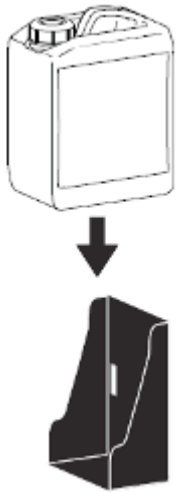
1.



2.

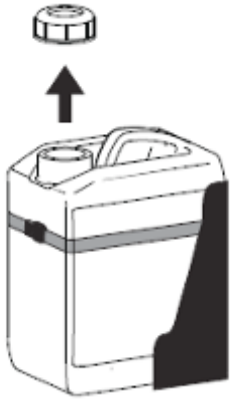


3.

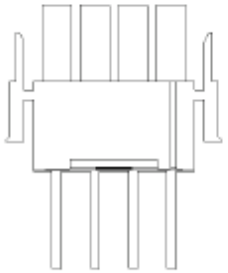


4.

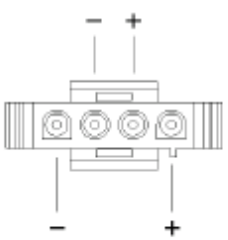
5.



Electrical Connections



Power line



Sense line

- Power line:
  This line supplies electrical power from the fuel cell to the battery.

  Note:

  In the presence of a central electrical box the power line should be connected to the outlet of the additional charging unit.

- Sense line:
  This line is used to measure the battery voltage.

  Note:

  Make sure the sense line is directly connected to the battery.

Recommended Battery Capacities

Product	EFOY 600	EFOY 900	EFOY 1200	EFOY 1600
Recommended battery capacity	10 Ah - 100 Ah	15 Ah - 150 Ah	20 Ah - 200 Ah	25 Ah - 250 Ah
Recommended type of battery	12 V Lead accumulators (lead-acid, lead-gel or AGM)			

- The above-listed minimum capacities must be observed in any case.
- If the runtime of the EFOY fuel cell is often less than one hour the switch-on threshold should be lowered or a higher-capacity battery should be used.
- Fewer long charge cycles are better than many short ones because consumption and wear of the unit rise during the start-up process.

Battery Knowledge

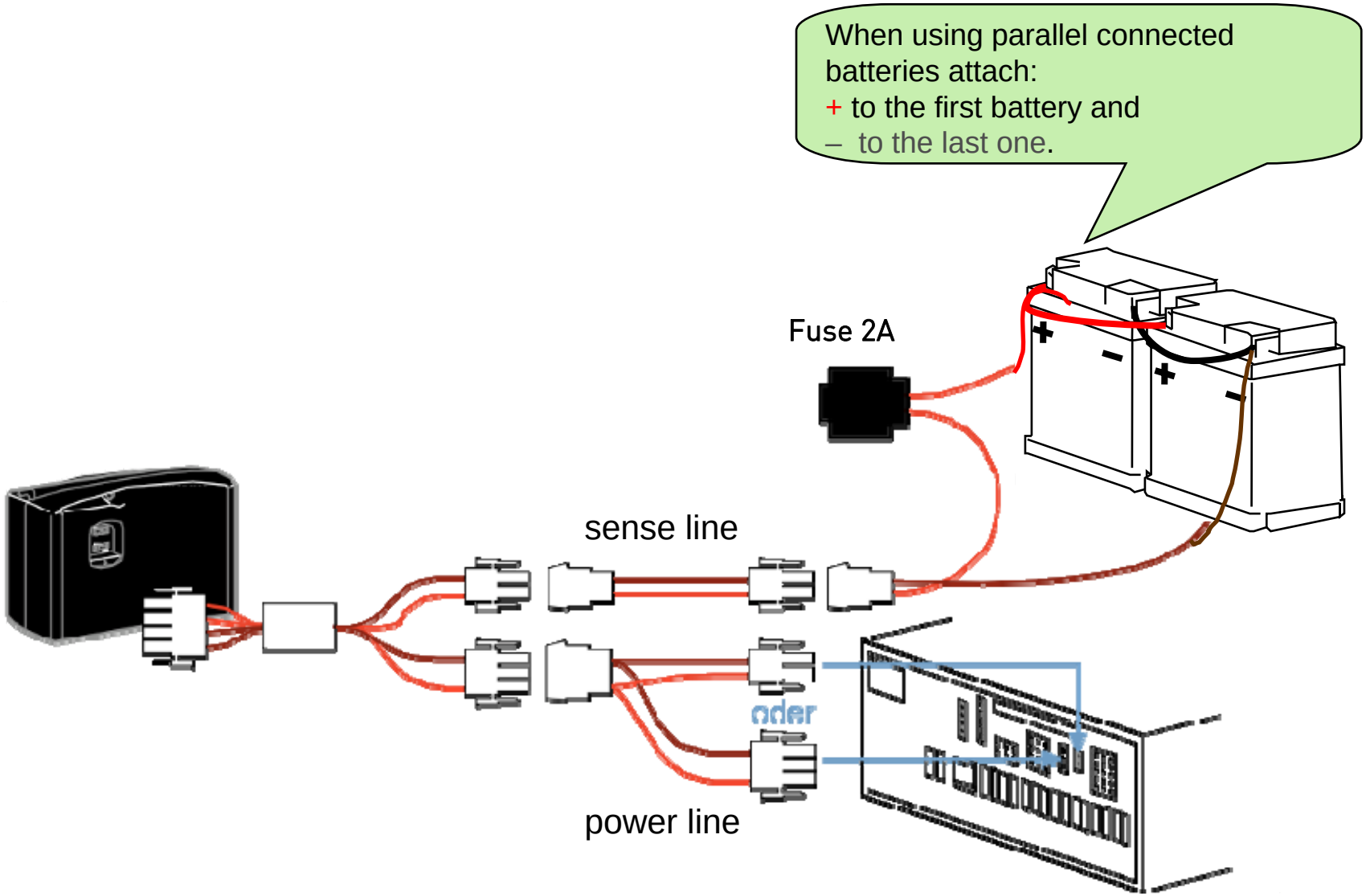
- Battery voltage depends, among other things, on:
  - Charge condition
  - Load current / charge current
  - Temperature

- Suitable types of battery
  - Lead-gel (recommended type of battery)
  - Lead-acid (liquid)
  - AGM

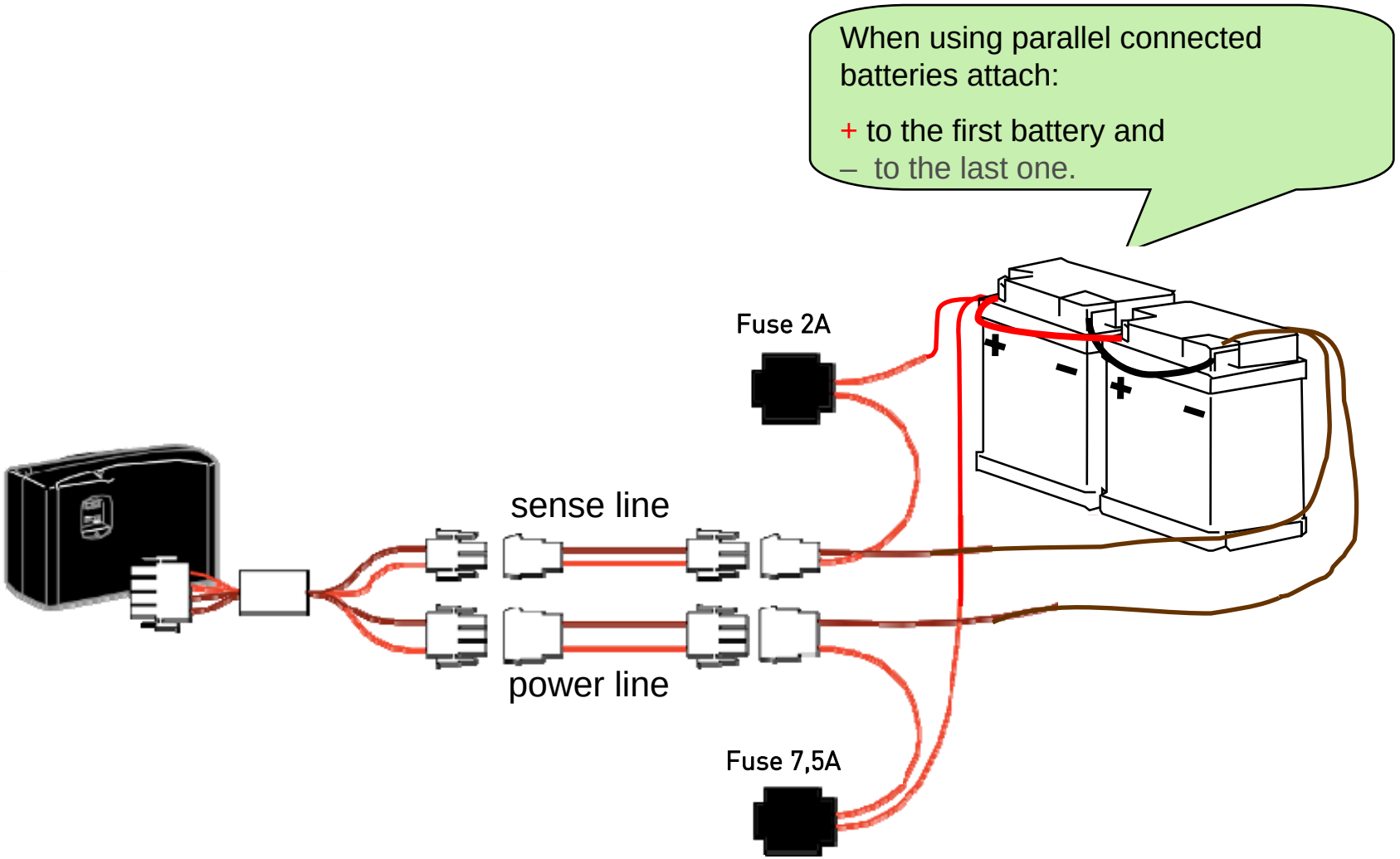
Note:

Please follow the recommendations of the battery manufacturer and, if the occasion arises, adjust the settings of the switch-on and switch-off thresholds by means of the interface adapter.

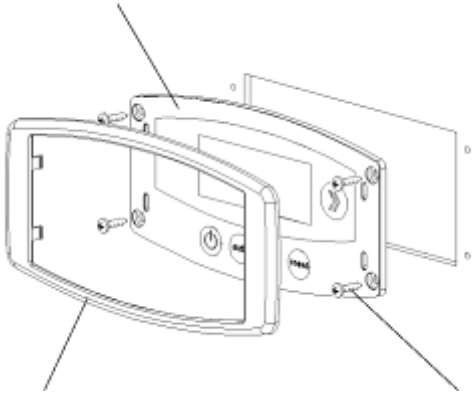
Electrical Connection via a Central Electrical Box



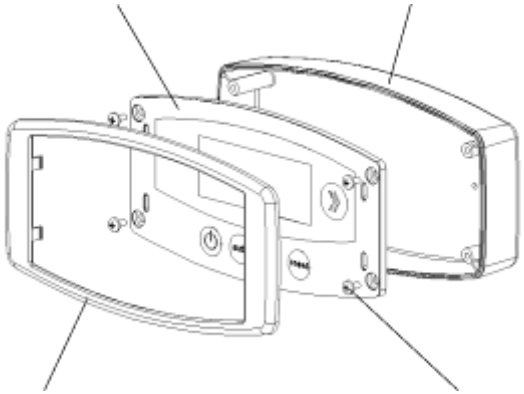
Electrical Connection Directly to the Battery



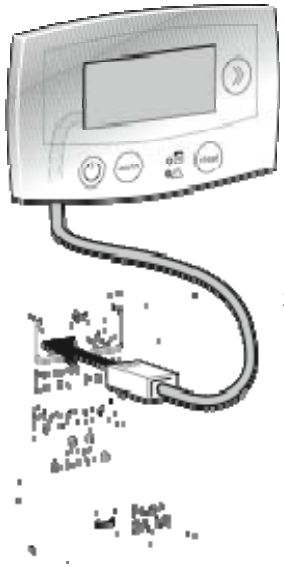
Mounting the Remote Control



Flush mounting



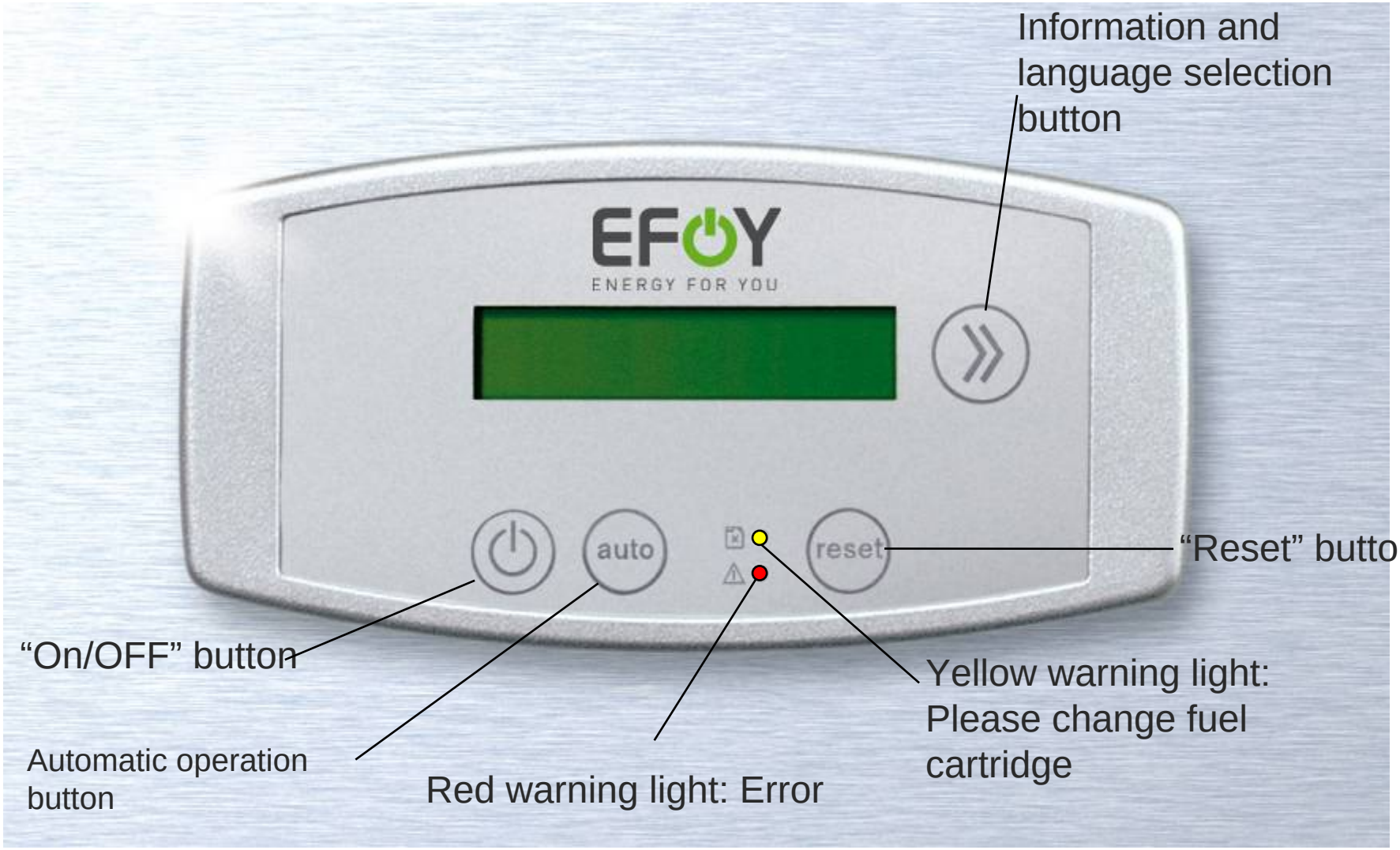
Surface mounting



Plug the remote control into the socket marked „Remote Control“

Note:
If the supplied DL1 data cable is not long enough or too long it may be replaced by a longer or shorter commercial network cable (Type: Category 5 patch cable).

Remote Control of the EFOY Fuel Cells



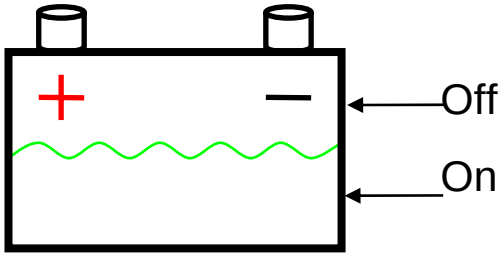
Contents

Start-Up

1. Clean the installation space.
2. Check all electrical contacts and the fastenings of fuel-cartridge holder and unit.
3. Connect the fuel cartridge to the unit and check for secure fastening.
4. “Auto” appears on the display of the remote control.
5. The unit is ready for operation and automatically starts operating at a battery voltage of 12.3 V.
6. Switch on the unit manually to check its functionality. This may be done up to a battery voltage of 13.2 V - if necessary, reduce the battery voltage by switching on electrical consumers.
7. Store the service kit and the User Manual inside the vehicle.

When does the EFOY Fuel Cell start operating?

Automatic

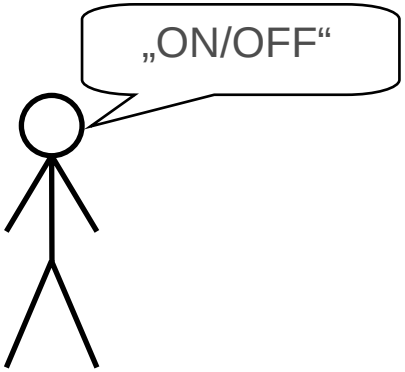


Battery voltage:

On: 12.3 V

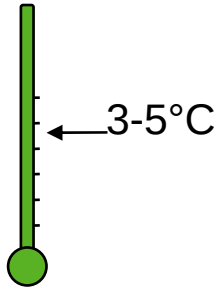
Off: 14.2 V

Manual



Manual start will only be possible at a maximum of 13.2 V.

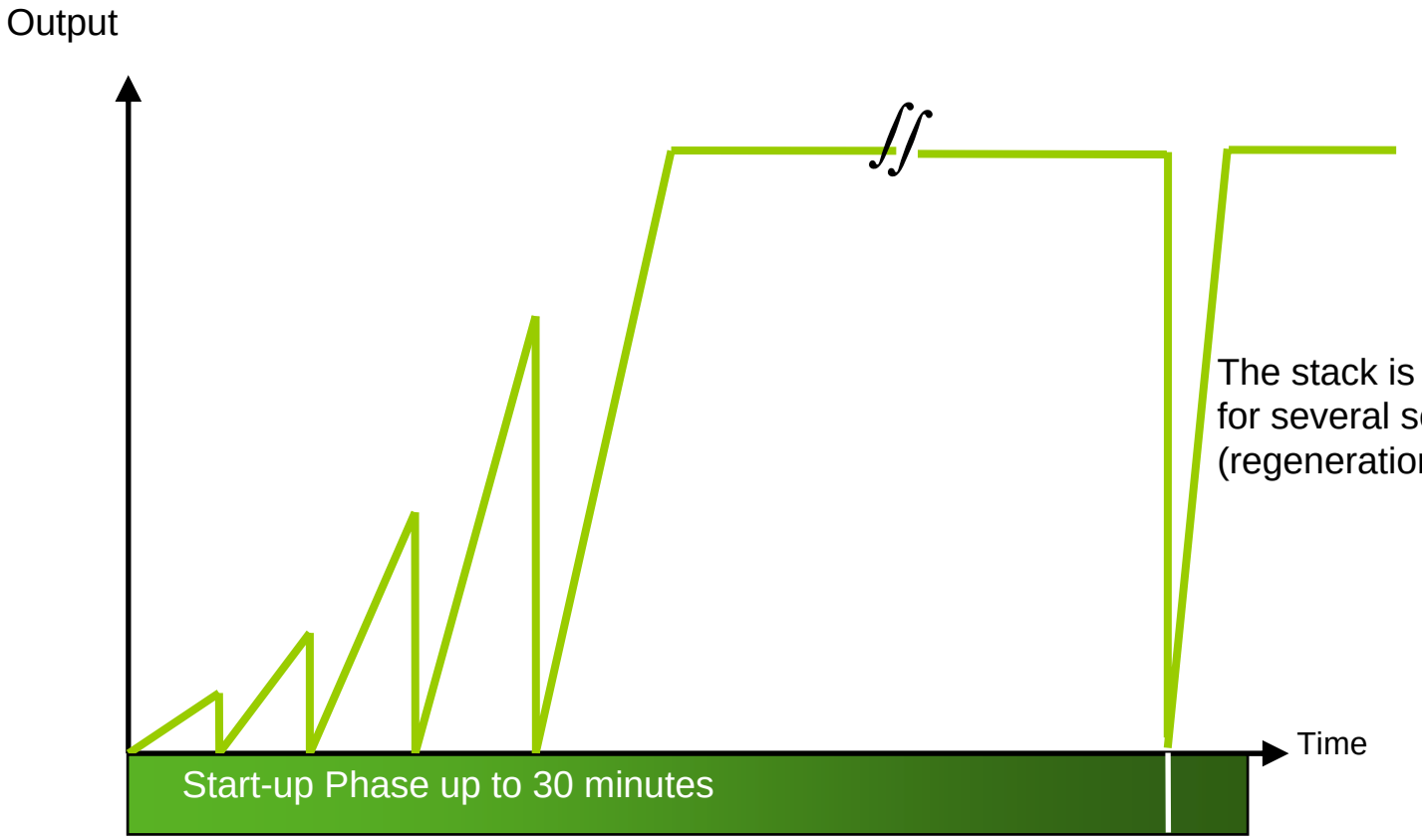
Antifreeze



Regardless of the battery voltage

Note: The system requires a minimum voltage of 10.5 V

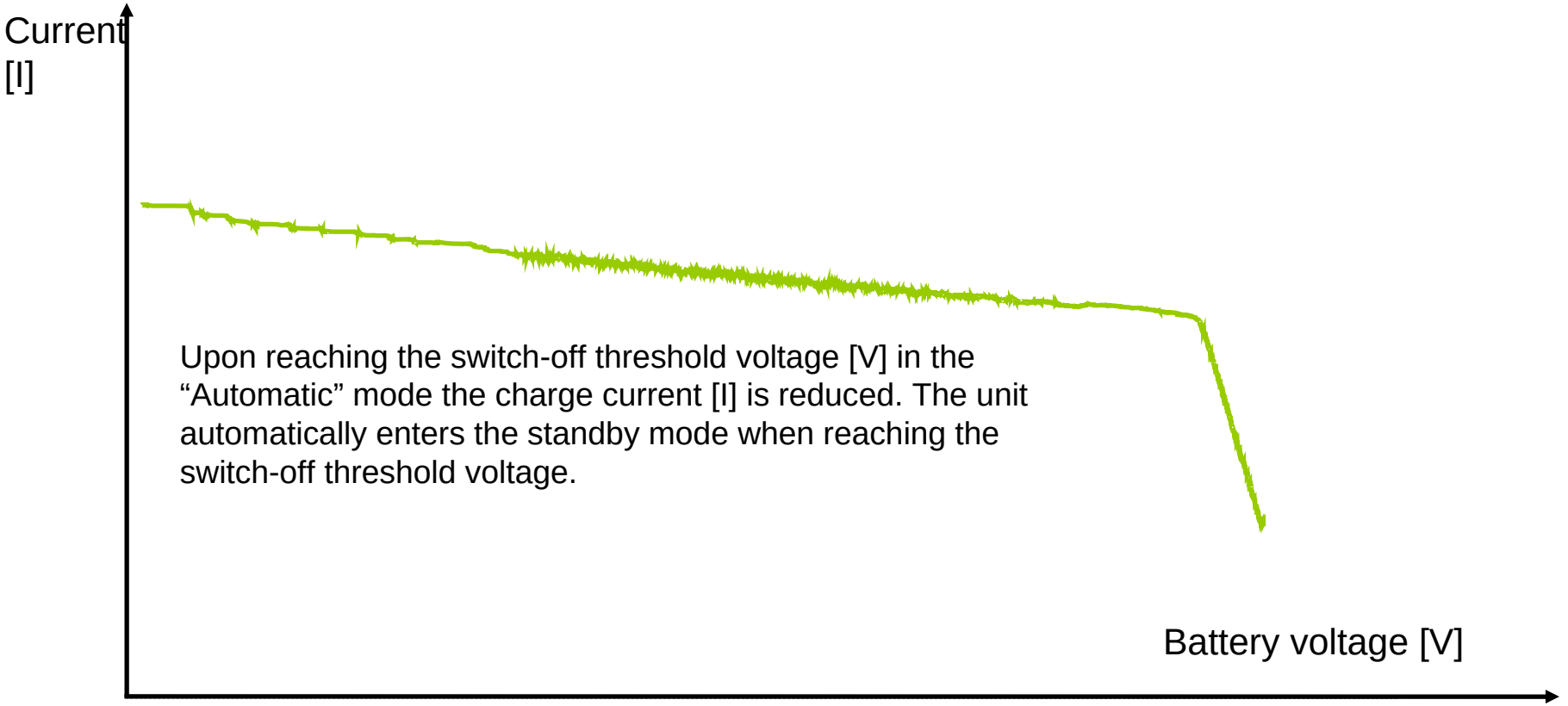
Start-up Phase of the EFOY Fuel Cell



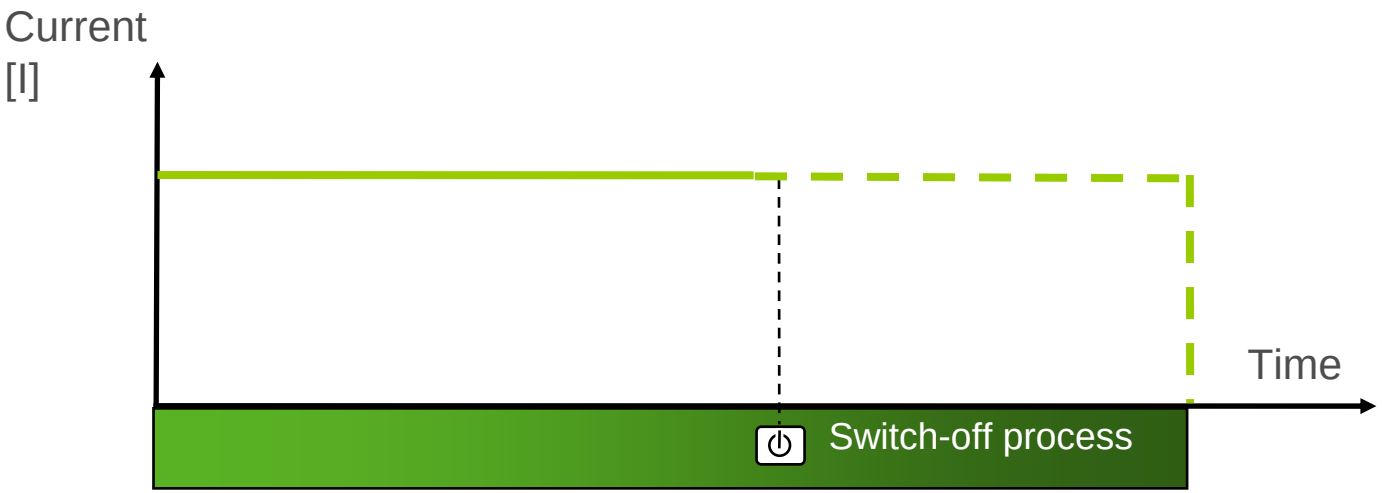
Note:

The EFOY Fuel Cell cannot be manually turned off during the start-up phase.

Switch-Off Cycle in the “Automatic” Mode



Switch-off Cycle in the “Manual” Mode



Note:

- The switch-off process allows a controlled disconnection of the EFOY Fuel Cell
- The switch-off process may take up to 30 minutes in the manual mode.
- Avoid interrupting the switch-off process.

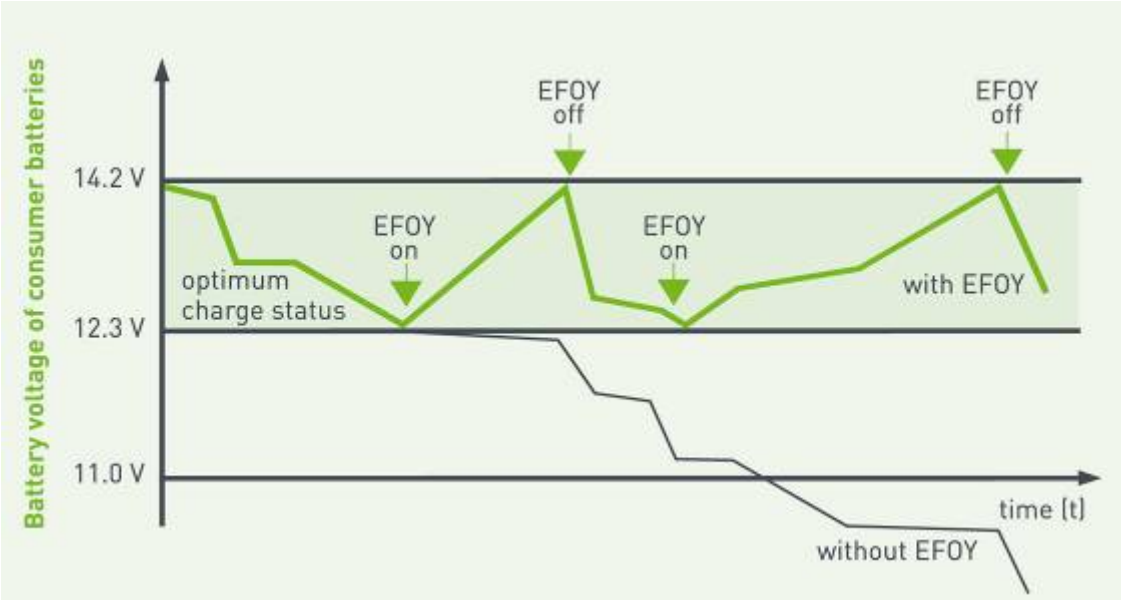
Service Fluid

- Service Fluid is needed when the unit is operated for extended periods of time at high temperatures.
- When the service fluid is low the red light turns on and the message “Please refill the service fluid” appears on the display of the remote control.
- There is no need to add service fluid when starting the unit for the first time.
- Make sure no dirt and no foreign matter enters the filler hole.
- Slowly pour the entire contents of the bottle into the filler hole with the unit slightly tilted.
- It is recommended to keep the service fluid together with the User Manual close to the unit.

Contents

Configuration of the ON and OFF Parameters using an Interface Adapter

Configuration on a PC using an interface adapter



Automatic operation of the EFOY Fuel Cells

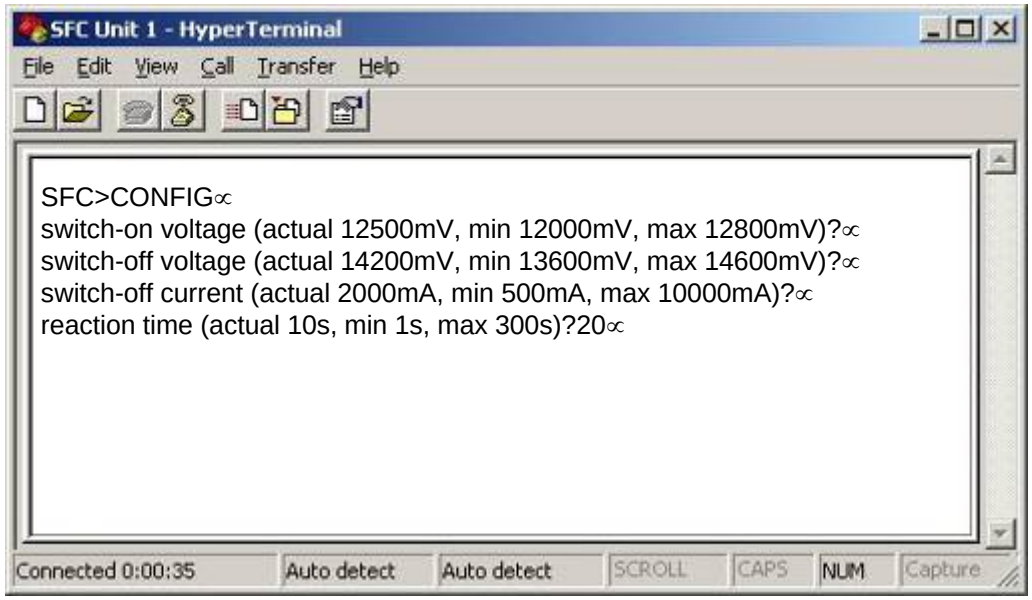
Control and Monitoring of the Operating Parameters

Components required:

- Interface Adapter IA1
- Data cable Cat.5
- PC using a terminal interface (e.g. Windows HyperTerminal)
- USB/RS232 adapter, if applicable

Parameter	Standard	Minimum	Maximum
Switch-on voltage	12.3 V	11.0 V	12.8 V
Switch-off voltage	14.2 V	13.6 V	14.6 V
Switch-off current	2 A	0.5 A	10.0 A
Reaction time	10 s	1s	300 s

Programming using a Terminal Software



Note:

For a detailed description see the Interface Adapter User Manual.

Customer Service

Our customer service representatives will gladly assist you with any questions concerning installation and start-up.

SFC Smart Fuel Cell AG

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Contents

Hybrid Control System: Installation

EFOY

- Please read the EFOY Fuel Cell User Manual or the above instructions carefully.

Solar module

- Please read the installation instructions of the solar charge controller or the battery computer, respectively. For further information please contact Büttner Elektronik.

- Please connect the control line of the charge controller or the battery computer to the „Data Interface“ socket of the EFOY Fuel Cell.

Note:

Make sure a solar module is connected before connecting the control line of the charge controller.

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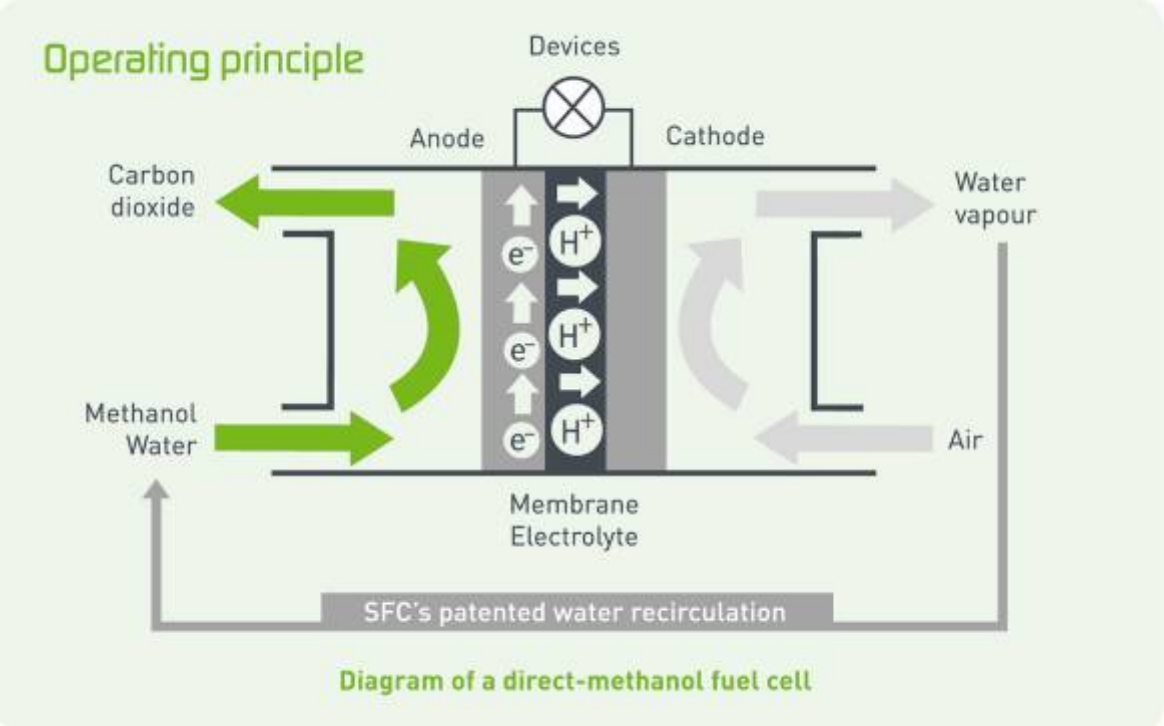
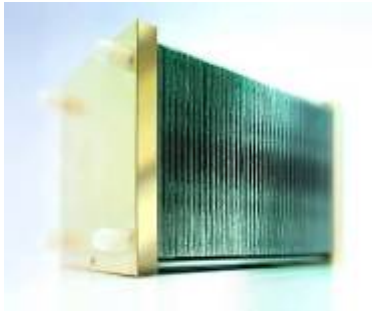
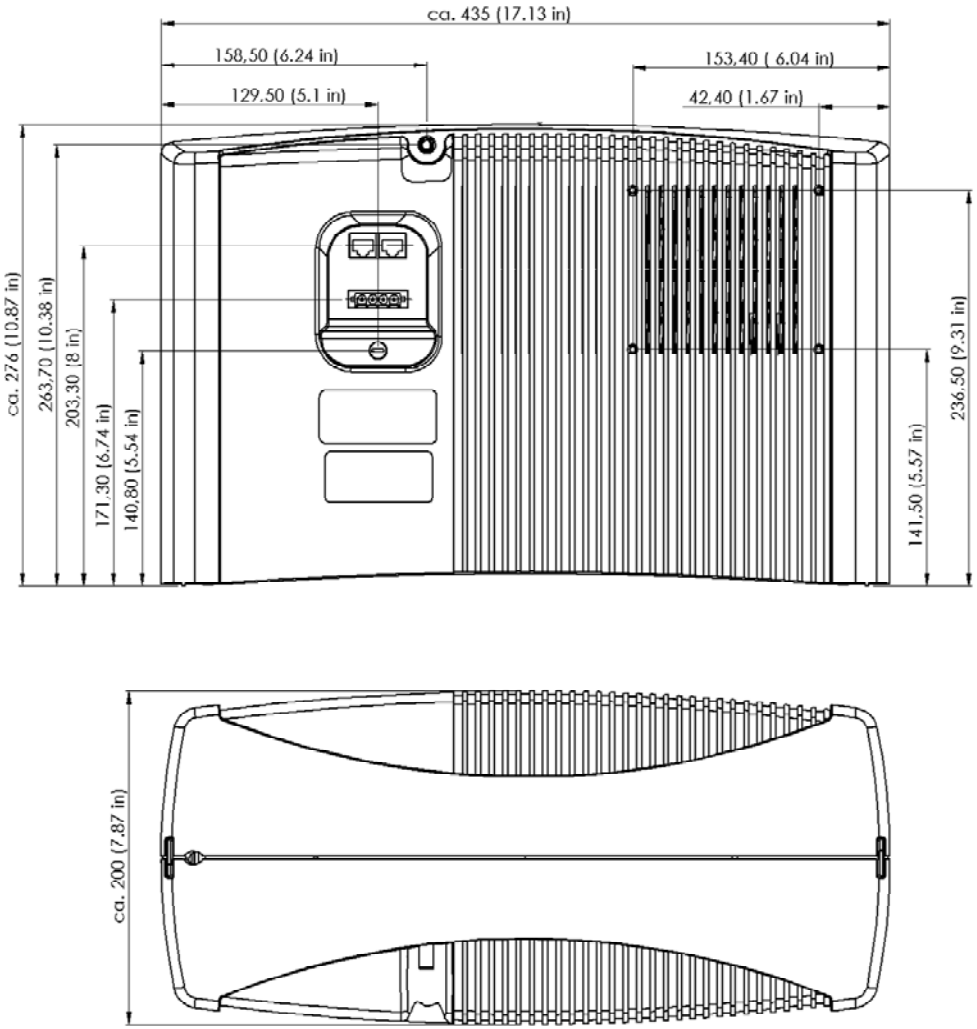
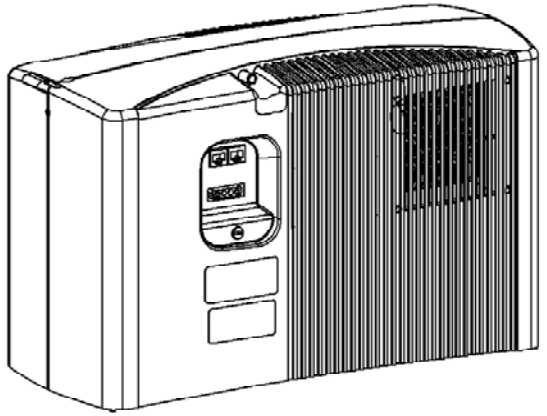
Operational Principle of the Fuel Cell



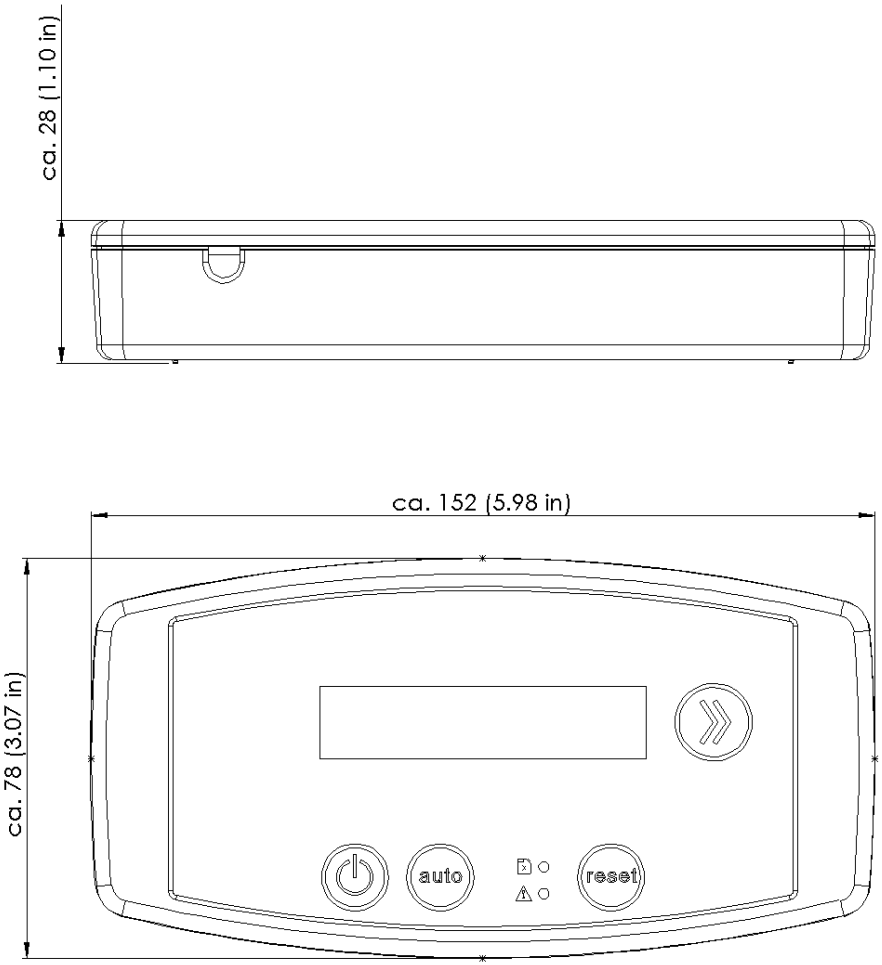


Dimensioned Drawing of the Main Unit



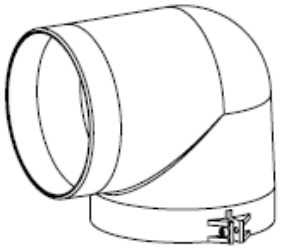


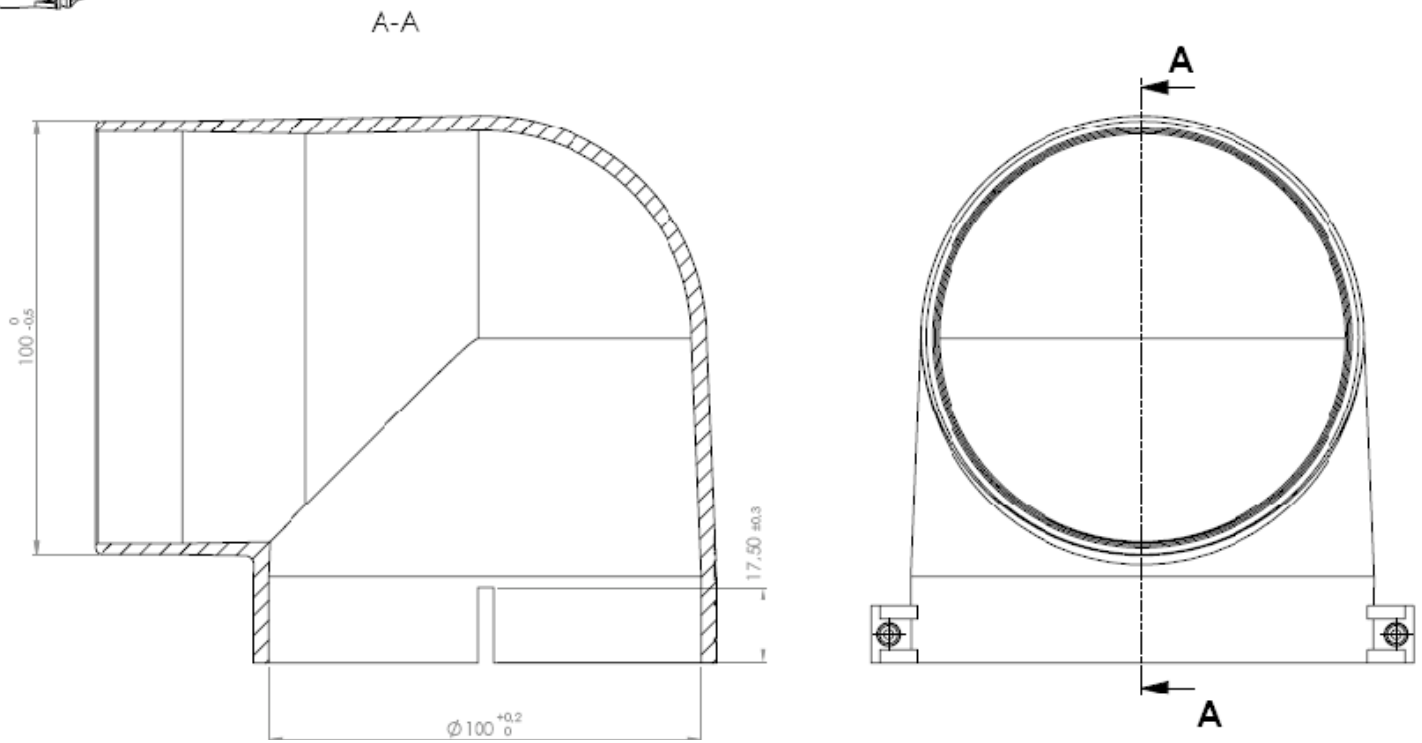
Dimensioned Drawing of the Remote Control



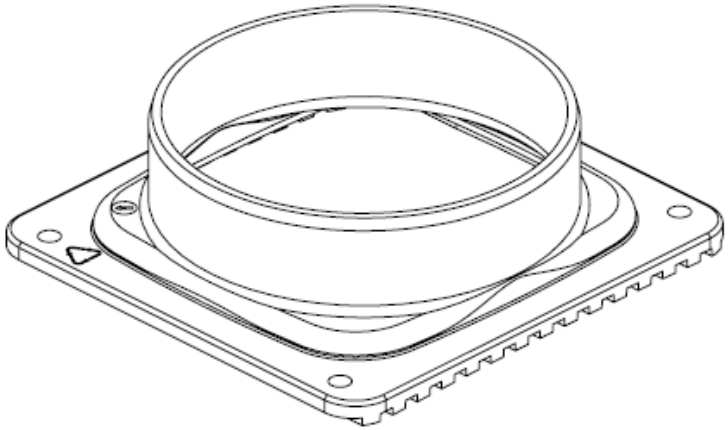
Note:
The standard equipment includes a drill template for flush mounting.

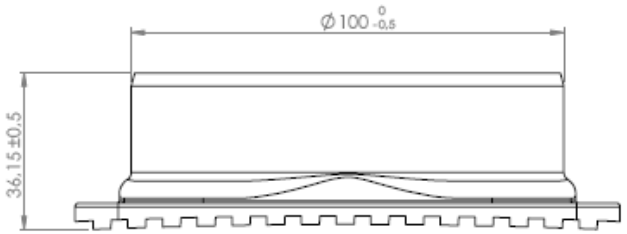
Dimensioned Drawing of the Off-Heat Bow

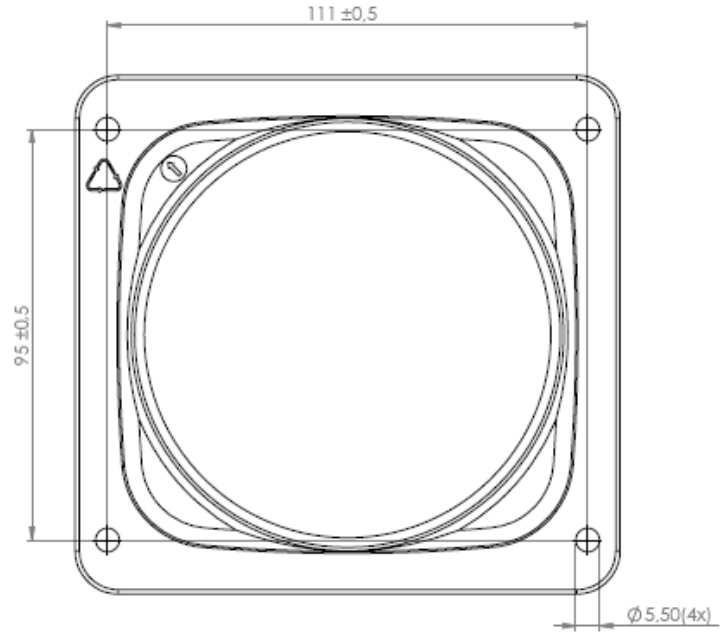




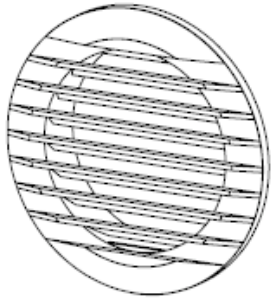
Dimensioned Drawing of the Off-Heat Flange

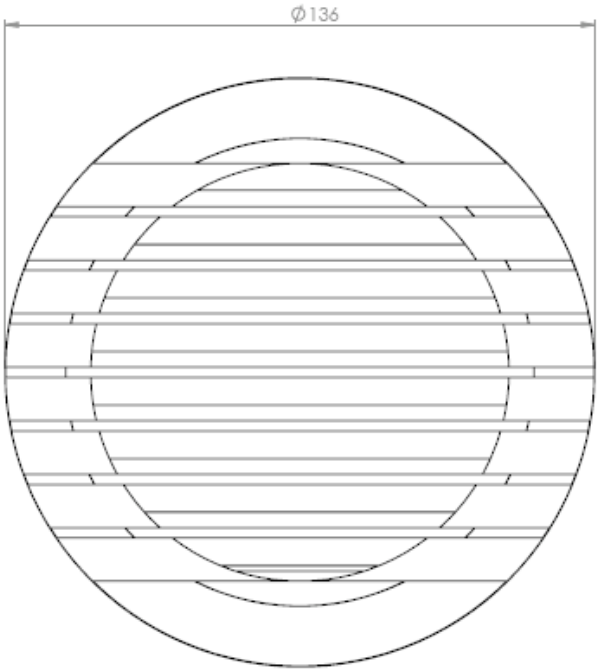


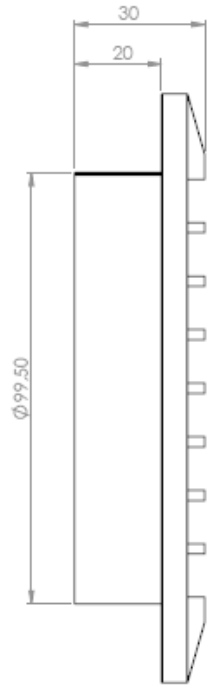




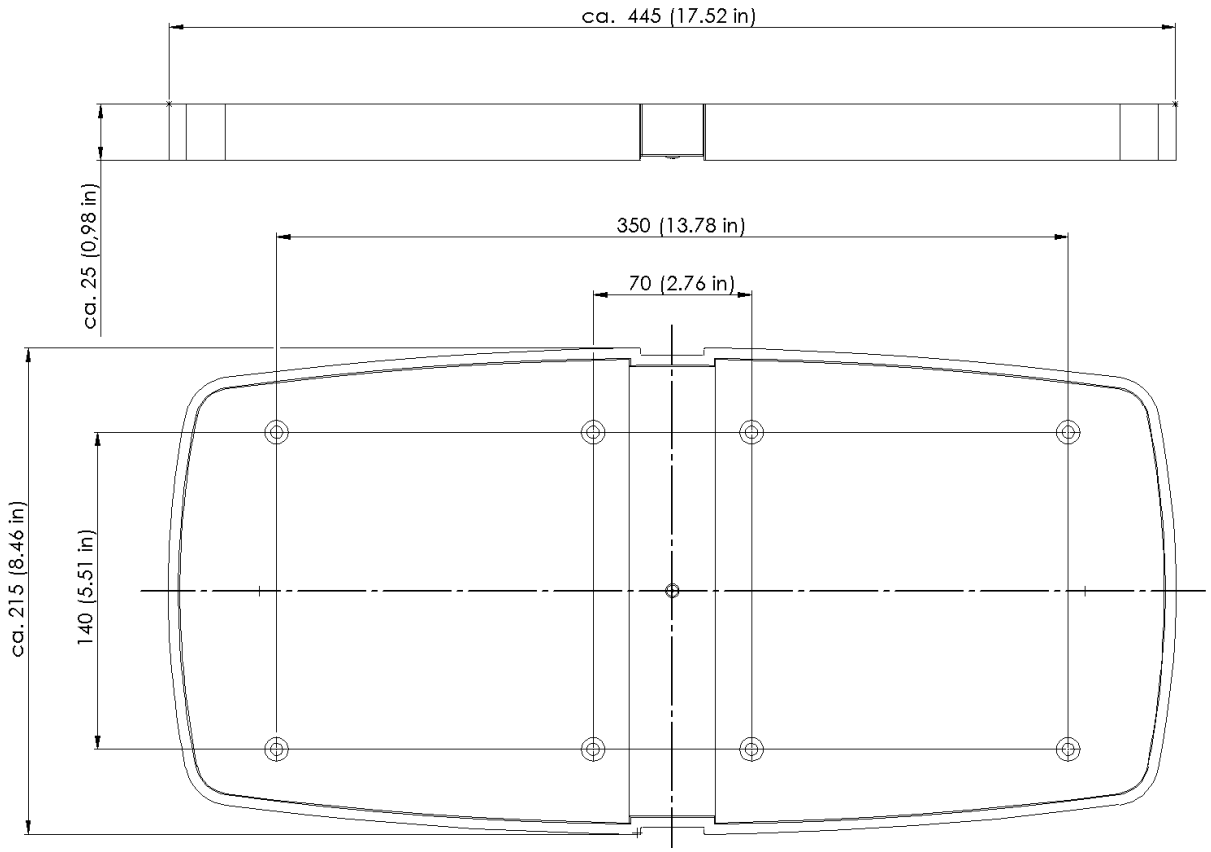
Dimensioned Drawing of the Orifice



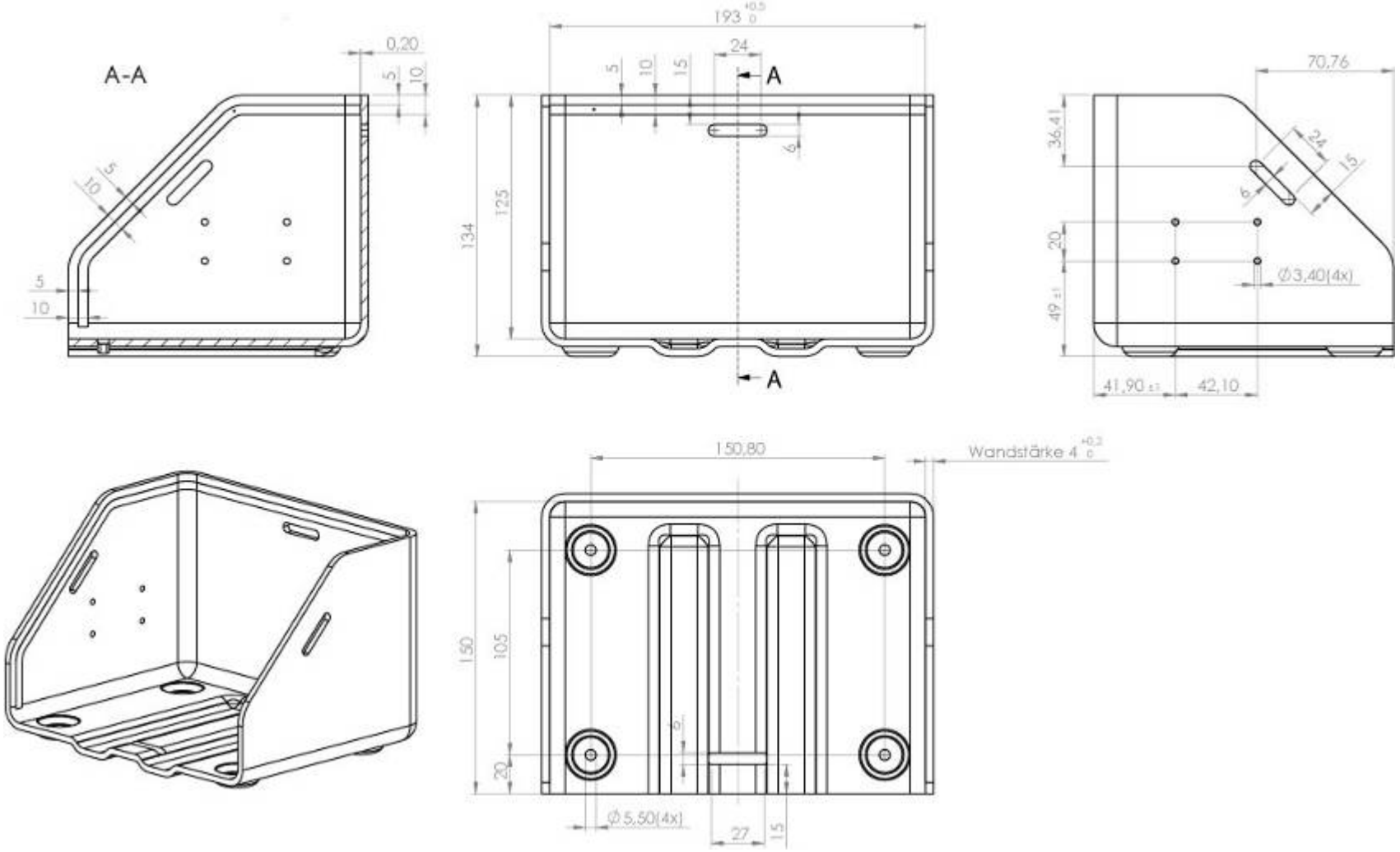




Dimensioned Drawing of the Mounting Plate

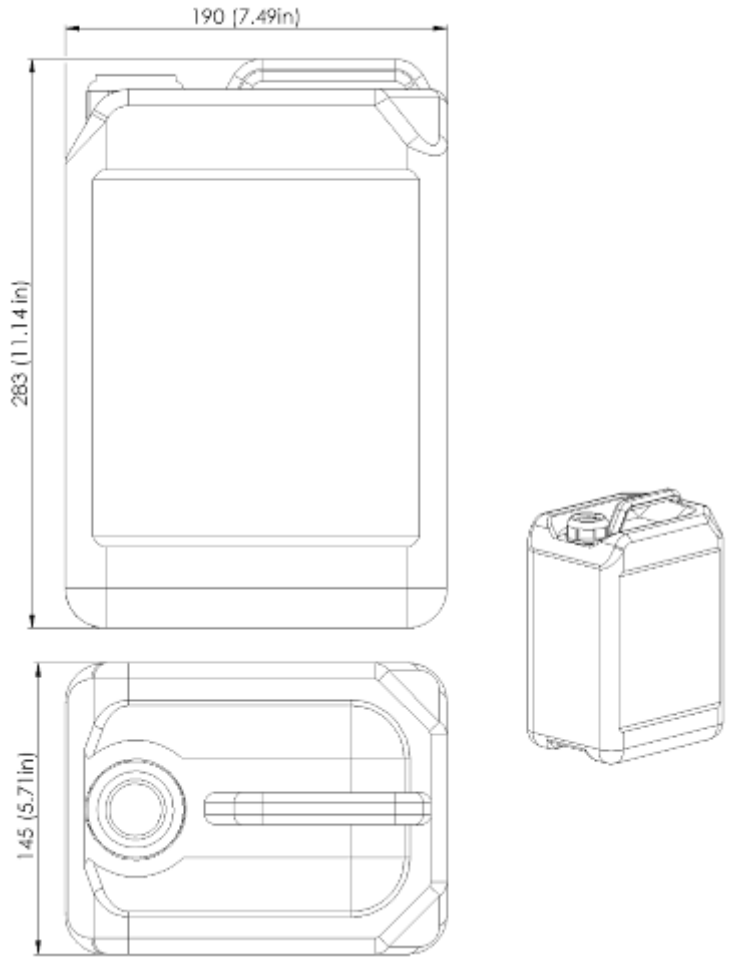


Dimensioned Drawing of the Fuel-Cartridge Holder M5/M10



Dimensioned Drawing of the Fuel Cartridge

M5



M10