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Introduction

1.1 Foreword

Thank you for choosing an EFOY fuel cell from SFC Energy AG. We hope you enjoy using your new energy supply system!

These mounting instructions are intended to be used by suitably qualified professionals. Please read these mounting instructions before mounting the fuel cell for the first time, and refer to the relevant chapters in the user manual for information about its further installation and use. Refer also to the further installation instructions.

If you still have any questions about installing or using your fuel cell, please contact the EFOY hotline.

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1.2 Contact details

Headquarters
SFC Energy AG Eugen-Sänger-Ring 7 85649 Brunenthal-Nord Germany Hotline: +49 89 / 673 592 555 Freecall*: 00800 / 732 762 78 eMail: service@efoy.com Web: www.efoy-comfort.com

*Calls can be placed free of charge from Germany, Belgium, Denmark, France, Great Britain, Italy, the Netherlands, Norway, Austria, Sweden, Switzerland and Spain.

2 Safety Information

2.1 Explanation of safety alert signal words



DANGER!

Indicates an imminently hazardous situation, which, if not avoided, poses a high risk of death or serious physical injury.



WARNING!

Indicates a potentially hazardous situation, which, if not avoided, poses a medium risk of death or serious physical injury.



CAUTION!

Indicates a hazardous situation, which, if not avoided, poses a slight risk of mild or moderate physical injury or damage to property.



INFO:

Important information for the operator or user of the system.

2.2 General safety instructions

Read the user manual before commissioning the fuel cell, and keep the user manual close to the device at all times.

Follow all of the instructions in this user manual.



The EFOY fuel cell must not be opened.

The EFOY fuel cartridge must not be opened or refilled using excessive force.

Modifications to the device constitute a safety hazard and may result in the loss of your operating license and nullify your warranty and guarantee.

Use original EFOY accessories only.



EFOY fuel cells and EFOY fuel cartridges must not be stored at temperatures over 50°C and must not be operated at temperatures over 40°C.

Protect from heat and direct sunlight.

Operate the EFOY fuel cell only as specified in the installation instructions, and in a well-ventilated space.



Keep EFOY fuel cells that have been switched off in frost-free storage or use the automatic antifreeze feature.



Do not smoke in the vicinity of the EFOY fuel cell or EFOY fuel cartridge. Protect from heat and ignition sources. Methanol is highly flammable!

A methanol spillage (e.g. after an accident or in the event of damage to the EFOY fuel cell or EFOY fuel cartridge) poses a fire hazard. Keep away from ignition sources and ensure good ventilation.

Leakage of a small quantity of methanol will evaporate, leaving no residue.



Keep all EFOY fuel cells and EFOY fuel cartridges out of reach of children, even when empty or only partly full.



WARNING!

Methanol is toxic when inhaled, swallowed or allowed to come into contact with the skin. Inhaling and swallowing methanol or allowing it to come into contact with your skin carries a serious risk of irreversible damage.

Call a doctor immediately if you have direct physical contact with the substance, in the event of an accident, or if you feel unwell, and show the doctor the fuel cartridge label, the methanol safety data sheet or the user manual.



WARNING!

In exceptional cases, the waste gases emitted by the device may contain substances that are harmful to health!

Do not inhale waste gases directly for prolonged periods. Instead, use the exhaust tube provided to route the waste gas into the open air.



WARNING!

Damage in the event of an accident; risk of injury!

EFOY fuel cells and EFOY fuel cartridges must be securely fastened to prevent damage in the event of an accident.



CAUTION!

The fuel cell is not water-tight!

Ensure that no water can enter the fuel cell.

2.3 Safety instructions for the fuel cartridge (methanol)



DANGER!

Leakage of methanol fumes poses a fire hazard!

Do not smoke when replacing the EFOY fuel cartridge and do not expose it to other ignition sources! Protect EFOY fuel cartridges from temperatures exceeding 50°C.

**WARNING!**

Methanol is highly flammable!

You receive methanol in safe, tested EFOY fuel cartridges, which prevent the contents from escaping if used correctly.

The storage and transport of methanol may be subject to statutory regulations.

For more information, refer to the safety sheet on methanol, available on our website at <http://www.efoy-comfort.com>

**WARNING!**

Methanol is toxic when inhaled, swallowed or allowed to come into contact with the skin. Inhaling and swallowing methanol or allowing it to come into contact with your skin carries a serious risk of irreversible damage.

You receive methanol in safe, tested EFOY fuel cartridges, which prevent you from coming into contact with the contents if used correctly.

Call a doctor immediately if you have direct physical contact with the substance, in the event of an accident, or if you feel unwell, and show the doctor the fuel cartridge label, the methanol safety data sheet or the user manual.

**CAUTION!**

Impurities in methanol!

Original EFOY fuel cartridges contain methanol that has been approved by SFC. Even slight impurities or foreign particles in commercially available methanol may cause irreversible damage to the device, and may nullify the warranty or guarantee.

Use only original EFOY fuel cartridges!

2.4 Correct use

The EFOY devices produced by SFC Energy AG are automatic charging devices for 12 V lead accumulators (batteries), or SFC qualified Lithium Iron Phosphate batteries (LiFePO₄). Please note the following:

- The devices must only be used to charge lead accumulators (batteries) that conform to the technical specifications in the "Technical details" chapter in the user manual.
- The devices must only be operated with original EFOY fuel cartridges.
- The devices are not intended to be used as an emergency power supply for medical, life-sustaining or agricultural systems.
- Devices with a defective or damaged housing must not be operated.
- The devices are not intended for industrial use.

2.5 Waste disposal

Packaging

Your new device was packaged to ensure that it reached you safely. All materials used in the packaging are environmentally friendly and can be re-used.

We recommend that you keep the packaging in case it is needed for winter storage.

However, if you wish to dispose of the packaging, please help our planet by disposing of it in an environmentally responsible way and in accordance with the applicable local regulations.



WARNING!

Plastic wrapping and cardboard boxes pose a risk of suffocation!
Please keep all packaging out of reach of children.

Fuel cartridges

Completely empty fuel cartridges can be disposed of with your plastic waste. Dispose of partly full fuel tanks in the same way as other hazardous waste, such as solvents and paint.

Old devices

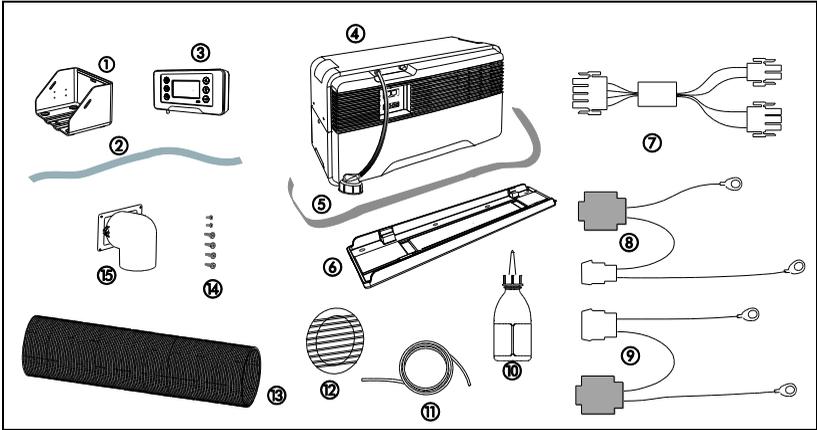
Old devices are more than just worthless rubbish! Environmentally responsible disposal can reclaim valuable raw materials, while protecting the environment.

Old electronic devices must not be disposed of in your household rubbish. Observe the local regulations.

For advice on returning old devices, please contact the EFOY hotline. The contact details are provided in chapter 1.2 "Contact details" on page 2.

3 Mounting Instructions

3.1 Product contents



1. Fuel cartridge holder
2. Belt for fuel cartridge
3. Operating panel with data line
4. EFOY fuel cell
5. Fastening belt
6. Mounting plate
7. Fuel cell charge line
8. Sense line for charging with 2 A fuse
9. Power line for charging with 15 A fuse
10. Service Fluid
11. Insulated exhaust hose
12. External face plate
13. Off-heat tube
14. Fastening screws for off-heat bow and off-heat flange
15. Off-heat bow with off-heat flange

3.2 Tools

You require the following tools and sealants to install the fuel cell:

- Electric drill
- Jigsaw
- Screwdriver
- 3 mm Allen key (Inbus)
- Sealant
- Scissors or cutters

Choose the following screws depending on the mounting surface (screws are not included in the delivery):

- 8 screws to secure the mounting plate (use 90° countersunk screws with a 5 mm (0.2 in) diameter. The shape of the shaft and thread depends on the material on which the mounting plate is to be secured.)
- 4 screws to secure the operating panel
- 4 screws to secure the fuel cartridge holder (use screws with a 5 mm (0.2 in) diameter. The shape of the shaft and thread depends on the material on which the fuel cartridge holder is to be secured.)
- Cable clamps to secure the cables if required

3.3 Important guidelines on choosing a location for installation

Installation should be carried out by trained personnel.

Ensure that there is sufficient unoccupied space behind the installation area before you drill or saw any openings. Please also observe the safety information provided by the tool manufacturers.



CAUTION!

Solvents may emit fumes during sealing. Ensure that there is sufficient ventilation and follow the instructions for using the sealing compound.



When choosing a location in which to install the fuel cell, please remember that the permitted operating temperature range for the device is -20°C to $+40^{\circ}\text{C}$ (-4°F to $+104^{\circ}\text{F}$), while the storage temperature must be between $+1^{\circ}\text{C}$ and $+45^{\circ}\text{C}$ ($+34^{\circ}\text{F}$ to $+113^{\circ}\text{F}$).



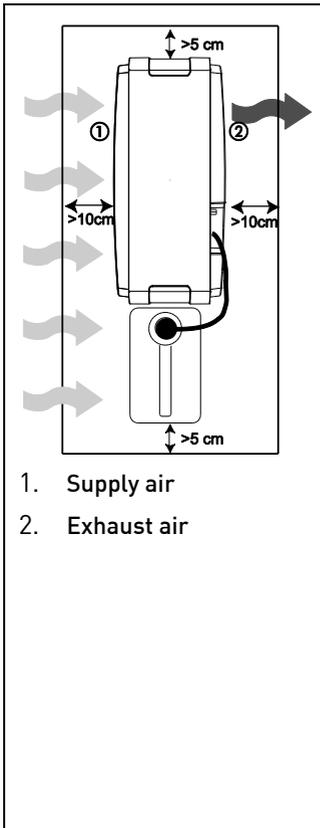
CAUTION!

The EFOY COMFORT fuel cell is not water-tight!
Ensure that no water can enter the fuel cell.



CAUTION!

The device generates waste heat and waste gases.
The waste heat and gases must be released into the open air.



- The space in which the device is to be installed (incl. M10 fuel cartridge and safety distance) must be at least 68 x 38 x 34 cm/26.8 x 15 x 13.4 in.
- To ensure circulation of air, the opening for the fresh-air supply must not be located directly in front of the fuel cell's fresh-air supply.
- The opening for the fresh-air supply must be at least 80 cm²/ 12.4 sq in (or at least 160 cm²/ 24.8 sq in for the EFOY Comfort 210).
- A gap of at least 5 to 10 cm/2 to 4 in must be left between the device and the panels enclosing the installation space.
- The air supply or fresh-air supply must not be blocked by the fuel cartridge.
- Install the device in an upright position only. Use the mounting plate provided for installation.

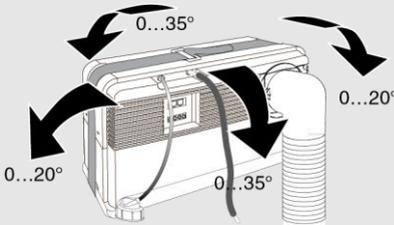


CAUTION!

Ensure that the device is not inclined to a degree further than permitted.

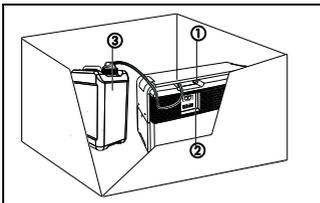
- Inclination along the direct axis:
- Inclination along the quadrature axis:

Continual: 35°
Temporary (<10 minutes): 45°
Continual: 20°



3.4 Planning the installation space

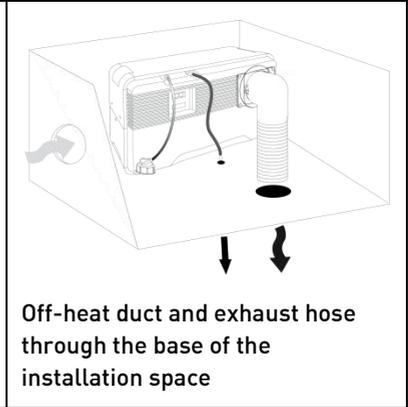
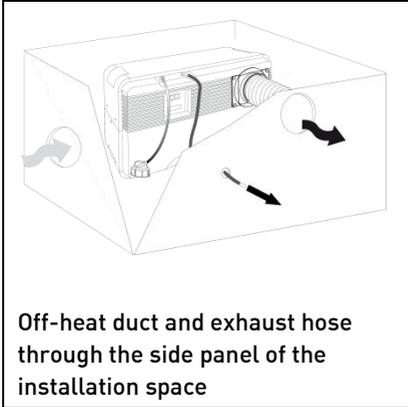
Please read this chapter carefully before you start mounting the device. You now need to plan where to secure the mounting plate and fuel cartridge holder, as well as where to position the openings for the air supply, off-heat duct and exhaust hose.



- The electrical connections (2), the fill opening for Service Fluid (1) and the fuel cartridge (3) must be easily accessible.

Examples for the off-heat duct and exhaust hose

- The off-heat duct supplied enables a controlled discharge of warmed air, which allows the device to be operated even in confined spaces.



- The waste gases (including condensation) can be conducted into the open air or, on yachts, into the bilge.



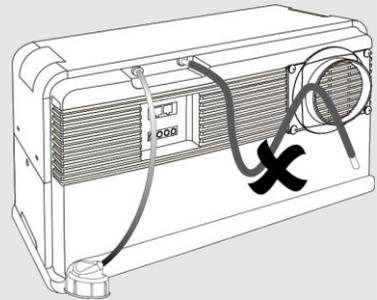
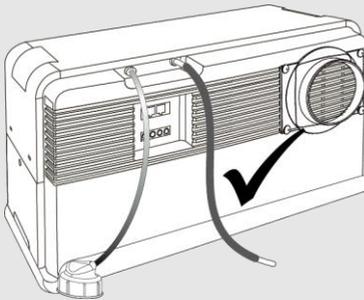
WARNING!

The temperature of the moisture-saturated waste gases may exceed 60°C/ 140°F during operation. This constitutes a scalding hazard. The waste gases may contain substances that are harmful to health. Avoid inhaling waste gases directly or for extended periods. The insulated exhaust hose must be vented outside.



INFO:

Avoid siphoning in the hose as this prevents the passage of the waste gases.

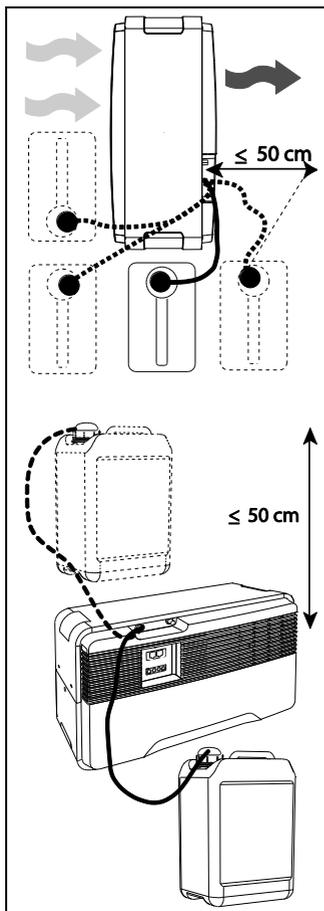


To prevent siphoning, ensure that the hose is pointing downwards.

**INFO:**

Take precautions to prevent the exhaust hose from freezing in winter.

- Use only the original insulated EFOY waste hose for this purpose.
- Keep the insulated exhaust hose as short as possible.

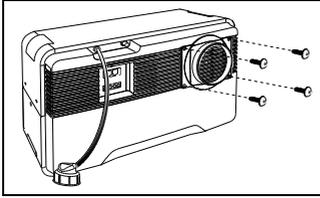
Example for positioning of the fuel cartridge

When positioning the fuel cartridge, please ensure that it is within reach of the fuel cartridge connection. The connection hose is 50 cm/20 in long and must not be kinked or pinched at any point.

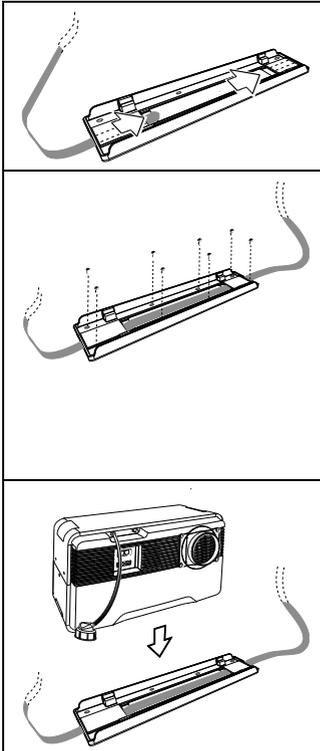
**CAUTION!**

Ensure that the fuel cartridge and the exhaust hose connection is undamaged and do not replace it with another connection hose.

Use only original EFOY connection hoses.

3.5 Mounting the off-heat flange

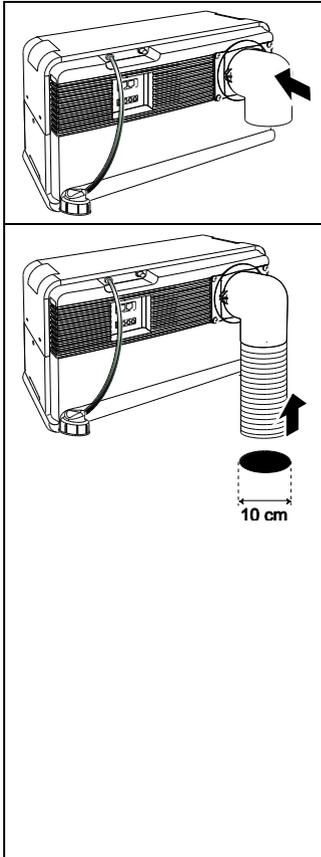
1. Use the screws supplied to screw the off-heat flange into the threads provided on the air outlet of the EFOY fuel cell.

3.6 Mounting the mounting plate for the fuel cell

1. Thread the belt for securing the EFOY fuel cell into the mounting plate.
2. Secure the mounting plate in the desired location using eight 90° countersunk screws with a 5 mm / 0.2 in diameter. Use suitable screws and, if necessary, dowels to ensure that the mounting plate will remain in place even if significant force is applied to it, for example, in the event of an accident.
3. Place the device on the mounting plate.

3.7 Creating openings for the off-heat duct and exhaust hose

The mounting instructions provided here are based on a scenario in which the waste heat is conducted through the base of the installation space. Follow the same steps if the waste heat is to be conducted through the side panel of the installation space.

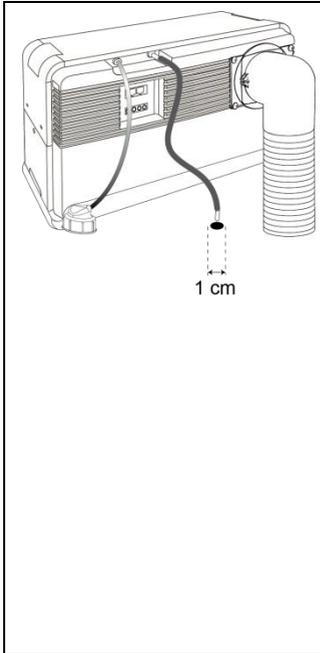


1. Attach the off-heat bow to the off-heat flange.
2. Attach the off-heat tube.
3. Take measurements to determine where to saw the duct opening. The duct opening should have a diameter of 10 cm/4 in.

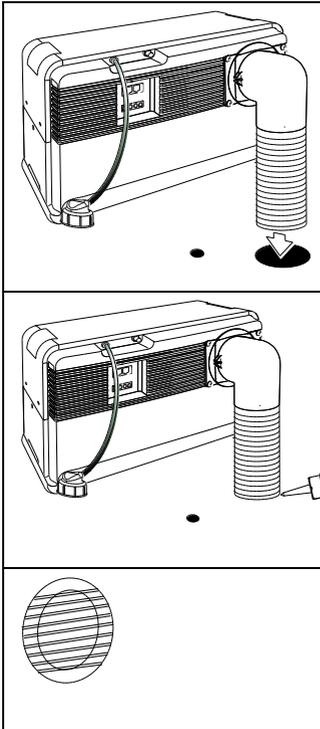


INFO:

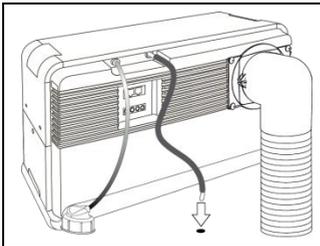
Ensure that there are no kinks in the flexible off-heat tube and use a second pipe bend (bow) if necessary (optional accessory). When drilling into spaces, please ensure that no cables are located in these spaces. Please also take particular care to ensure that you do not cut through any load-bearing parts of the vehicle. For more information, contact your vehicle manufacturer.



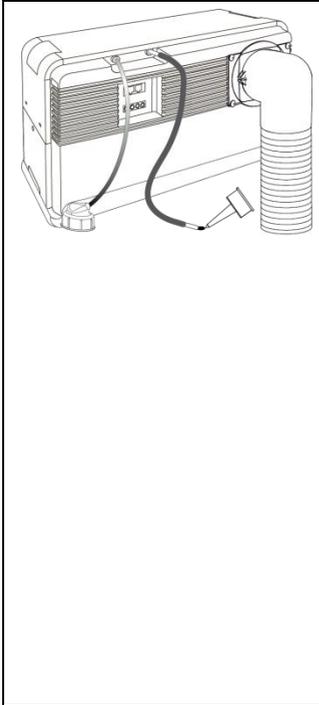
4. Remove the red protective cap from the exhaust gas outlet of the EFOY fuel cell.
5. Attach the **straight** end of the exhaust hose supplied to the exhaust gas outlet.
6. Take measurements to determine where to saw the duct opening. The duct opening should consist of a hole with a 1 cm/0.4 in diameter.
7. Remove the device while drilling and sawing to keep it clean.
8. Saw a hole as a duct opening for the off-heat tube.
9. Drill a hole for the waste hose.

3.8 Mounting the off-heat duct

1. Place the EFOY fuel cell on the mounting plate again.
2. Feed the off-heat tube through the duct opening. You may shorten the tube if necessary.
3. Use a suitable sealant to seal the duct opening to prevent moisture from penetrating into the interior of the fuel cell or the space around it. This is guaranteed if you use original EFOY accessories and if the fuel cell is installed correctly by a qualified professional.
4. Attach the external face plate to the external opening of the off-heat tube to prevent foreign bodies from entering the tube.

3.9 Mounting the insulated exhaust hose

1. Attach the **straight** end of the exhaust hose supplied to the exhaust gas outlet.
2. Feed the **diagonal** end of the exhaust hose out of the installation space.



3. Use a suitable sealant to seal the hole. Ensure that the exhaust hose has no kinks or blockages and that the waste gases can flow freely out of it. Please also pay particular attention to the information about siphoning in the chapter entitled "Important guidelines on choosing a location for installation" on page 10.



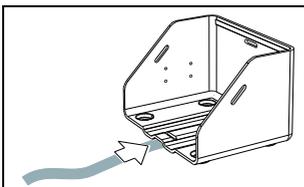
INFO:

Please keep the exhaust hose as short as possible. The portion of the hose that penetrates outside should be no longer than 5 cm/2 in. Cut the end of the hose diagonally to prevent drop formation.

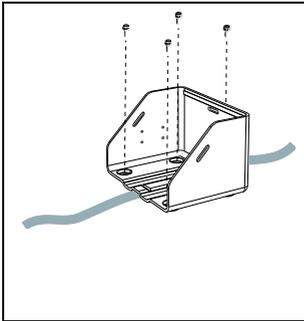
4. The further steps involved in installing the EFOY fuel cell are described in the user manual.

3.10 Installing the fuel cartridge holder

- Fuel cartridges and reserve fuel cartridges must not be placed in front of the inlet or outlet for the exhaust heat flow.
- Fuel cartridges can be placed next to the device or in front of it, as shown in the chapter entitled "Example for positioning of the fuel cartridge" on page 14.
- The device and the fuel cartridge must be installed at the same height.



1. Thread the belt into the fuel cartridge holder.



2. Secure the fuel cartridge holder with four screws and, if necessary, with dowels to ensure that it will remain in place even if significant force is applied to it, for example, in the event of an accident.
3. The further steps involved in installing the EFOY fuel cartridge are described in the user manual.

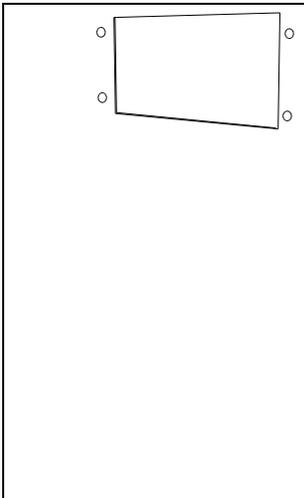
3.11 Installing and connecting the operating panel

The operating panel displays the current status of the device and is used to operate the fuel cell. Mount the operating panel in a location that is easily accessible, e.g. in the cockpit.

The operating panel is available in two variants:

- Flush-mounted operating panel
- Surface-mounted operating panel

3.11.1 Mounting the flush-mounted operating panel



INFO:

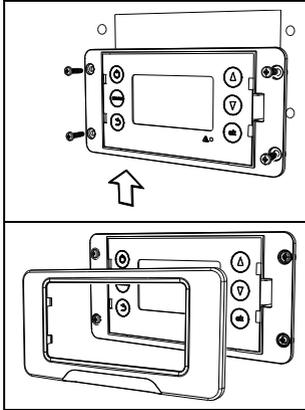
When mounting a flush-mounted operating panel, ensure that there is sufficient space for the electrical components behind the opening.



INFO:

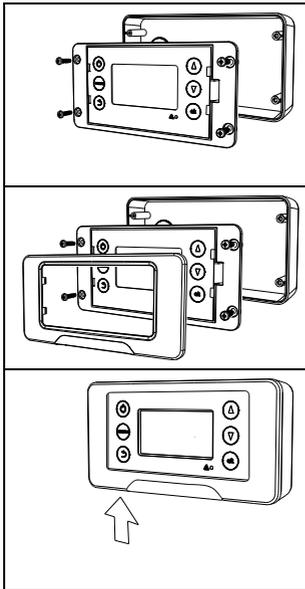
Use the drilling and sawing templates provided for flush mounting.

1. Use the jigsaw to saw an opening for the flush mounting.
2. Holes may need to be pre-drilled, depending on the type of screws used.



3. Connect the operating panel to the data line provided.
4. Secure the operating panel with four suitable screws.
5. Then attach the frame to the operating panel.

3.11.2 Mounting the surface-mounted operating panel



1. Use the screws provided to attach the operating panel securely to the surface-mount housing.
2. Attach the frame to the operating panel.
3. Connect the operating panel to the data line provided.
4. Then attach the control panel to the wall, for example with a Velcro or adhesive film, so that it can be loosened later.

3.12 Electrical connections



WARNING!

All electrical work must only be carried out by qualified electrical technicians in accordance with the relevant legal provisions.

Laying cables incorrectly or using the wrong cable size may result in a fire hazard.

All connected cables must have sufficient insulation and adequate proof voltage, and the connectors must be scoop-proof. The laying of uninsulated cables and connectors is not permitted.



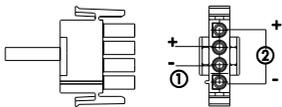
INFO:

Use the charge line supplied to connect the device.

The charge line must be connected to the battery using a fused circuit or the battery fuses supplied.

Check polarity before you connect the device.

Run both charge lines (power line and sense line) to the battery, as otherwise the voltage measurement will be incorrect.



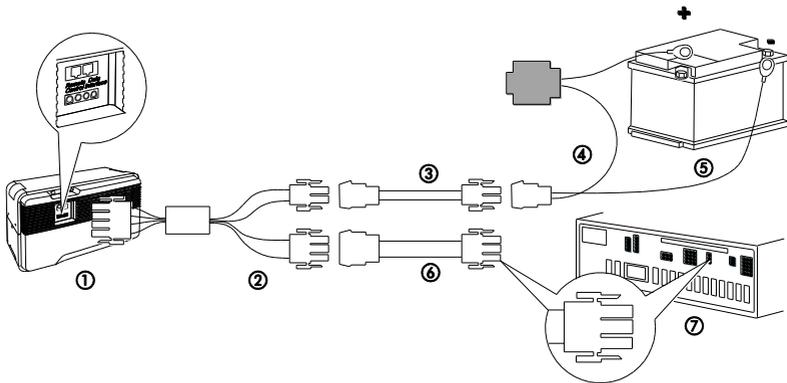
1. Power line
2. Sense line

- The charge line comprises four leads. The two power lines serve to charge the battery with electricity. The two sense line measure the battery voltage.
- The following cable cross-sections are recommended in order to minimize ohmic drops in the charge line:

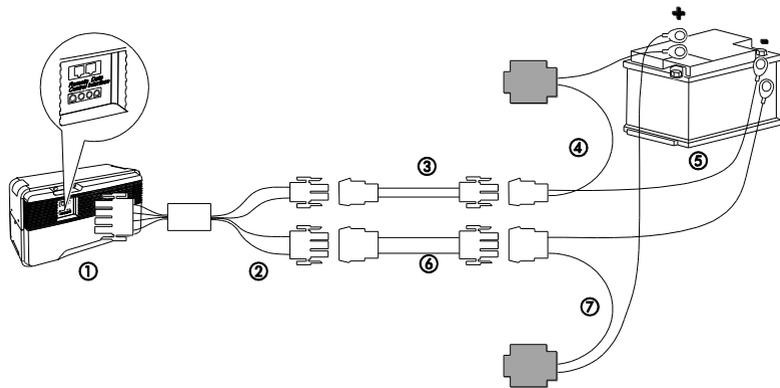
Length [m]	min. cable cross-section
< 5 m (16 ft)	2.5 mm ² (0.004 sq in)
5 – 10 m (16-32 ft)	4 mm ² (0.007 sq in)
10 – 15 m (32-49 ft)	6 mm ² (0.01 sq in)

1. Decide whether to connect the EFOY fuel cell via a central electrical box or to the battery directly, depending on your vehicle's layout.
2. Lay the cables in the vehicle.
3. Instructions for connecting the cables to the EFOY fuel cell are provided in chapter 3 of the user guide under "Commissioning".

3.12.1 Electrical connection via central electrical box



1. EFOY fuel cell
2. Fuel cell charge line
3. Sense line extension – 8 m / 26 ft (available as an optional accessory, item no.: 151 906 005)
4. Sense line for charging with 2 A fuse
5. Battery
6. Power line extension – 8 m / 26 ft (available as an optional accessory, item no.: 151 906 006)
7. Central electrical box (EBL)

3.12.2 Direct electrical connection to the battery

1. EFOY fuel cell
2. Fuel cell charge line
3. Sense line extension – 8 m / 26 ft (available as an optional accessory, item no.: 151 906 005)
4. Sense line for charging with 2 A fuse
5. Battery
6. Power line extension – 8 m / 26 ft (available as an optional accessory, item no.: 151 906 006)
7. Power line for charging with 15 A fuse

4 Technical data

Performance data

Product	EFOY COMFORT 80	EFOY COMFORT 140	EFOY COMFORT 210
Max. charge capacity	960 Wh/day 80 Ah/day	1728 Wh/day 144 Ah/day	2520 Wh/day 210 Ah/day
Max. nominal power ¹	40 W	72 W	105 W
Expected nominal power at 3000h ¹	30 W	60 W	85 W
Max. charging current at 12 V	3.3 A	6.0 A	8.8 A
Nominal voltage	12 V		
Switch-on voltage ²	< 12.3 V		
Cut-off threshold ²	> 14.2 V		
Required starting voltage	9 V		
Quiescent power consumption	15 mA		
Methanol consumption	0.9 l/kWh (0,24 US gal/kWh)		
Recommended batteries ³	12 V lead batteries (lead acid, lead gel, AGM or LiFePO4)		
	40 - 160 Ah	60 - 250 Ah	80 - 350 Ah
Recommended for the following energy requirements/day	Up to 60 Ah	Up to 115 Ah	Up to 180 Ah

¹ The nominal power varies by +/- 10%, decreases with the operating hours.

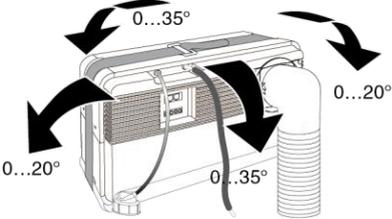
² Factory default – can be changed via the operating panel (expert mode).

³ The default values are the optimal values preset ex works. If the battery capacities differ significantly, please contact your specialist dealer.

General data

Product	EFOY COMFORT 80	EFOY COMFORT 140	EFOY COMFORT 210
Sound pressure level at a distance of 7 m	25 dB(A)		
Weight	7.1 kg / 15.7 lbs	7.9 kg / 17.4 lbs	8.5 kg / 18.7 lbs
Dimensions	44.3 x 20.2 x 28.8 cm (17.4 x 7.9 x 11.3 in)		

Installation requirements

Space requirement (LxWxH)	68 x 38 x 34 cm (minimum) / 26.8 x 15 x 13.4 in
Inclination - along the direct axis - along the quadrature axis 	Continual: 35° Temporary (<10 minutes): 45° Continual: 20°
Operating temperature	-20 to +40°C / -4°F to +104°F)
Starting temperature	+5 to +40°C / +41°F to +104°F)
Storage temperature	+1 to +45°C / +34°F to +113°F)



INFO:

The specifications are subject to change without notice.

Fuel cartridge

Fuel cartridges	M5*	M10
Volume	5 liters	10 liters (2.64 US gal)
Weight	4.3 kg	8.4 kg / 18.5 lbs
Dimensions (L x B x H)	19.0 x 14.5 x 28.3 cm	23.0 x 19.3 x 31.8 cm (9.1 x 7.6 x 12.5 in)

*not available in all countries

**INFO:**

The installation manual for the EFOY COMFORT fuel cell and other manuals are available in the Downloads area on our website at www.efoy-comfort.com.