SOLARWATT®

Battery flex AC-1

Installation and operating instructions
EN

#01414 | Rev 12 | 21.07.2023

#01414 | Rev 12 | 21.07.2023

General information

ABOUT THESE INSTRUCTIONS

Read these installation and operating instructions thoroughly to ensure that the Battery flex battery storage system functions perfectly. Installation and maintenance must be carried out by a qualified electrician who has been certified by Solarwatt. The installation and operating manual should be stored in a place close to the Battery flex storage system and must be accessible at all times to everyone who works on the storage battery. These installation and operating instructions enable you to install the Battery flex battery storage system and put it into operation safely and correctly.

ABOUT SOLARWATT

As one of the largest providers of photovoltaic systems, Solarwatt develops high-quality products for solar energy generation and consumption for you: glass-glass modules, electricity storage system and energy management solutions. And everything is made in Germany, as you would expect. By choosing a Solarwatt Battery flex storage battery, you will benefit from a high-quality, innovative product from the Solarwatt range.

SCOPE OF APPLICATION

These installation and operating instructions apply to the Battery flex AC-1 product range by Solarwatt GmbH, which comprises the following product components:

- Battery flex base AC-1 1.3 (6.0 kW)
- Battery flex middle pack 1.3 (2.4 kWh, 30 A)
- Battery flex top pack 1.3 (2.4 kWh, 30A)
- AC sensor Flex

OTHER APPLICABLE DOCUMENTS

Technical data sheet for SOLARWATT Battery flex base AC-1
Technical data sheet for SOLARWATT Battery flex pack

TERMS AND ABBREVIATIONS

AC	Alternating current
DC	Direct current
ACS	AC Sensor Flex alternating current sensor
CAN	Controller Area Network
RS-485	RS-485 data bus
LAN	Local area network
ESC	Energy supply company
LED	Light-emitting diode
PE	Protective earth
PV	Photovoltaics
IR	Inverter
RfG	Requirements for generators (grid connection conditions for generators)

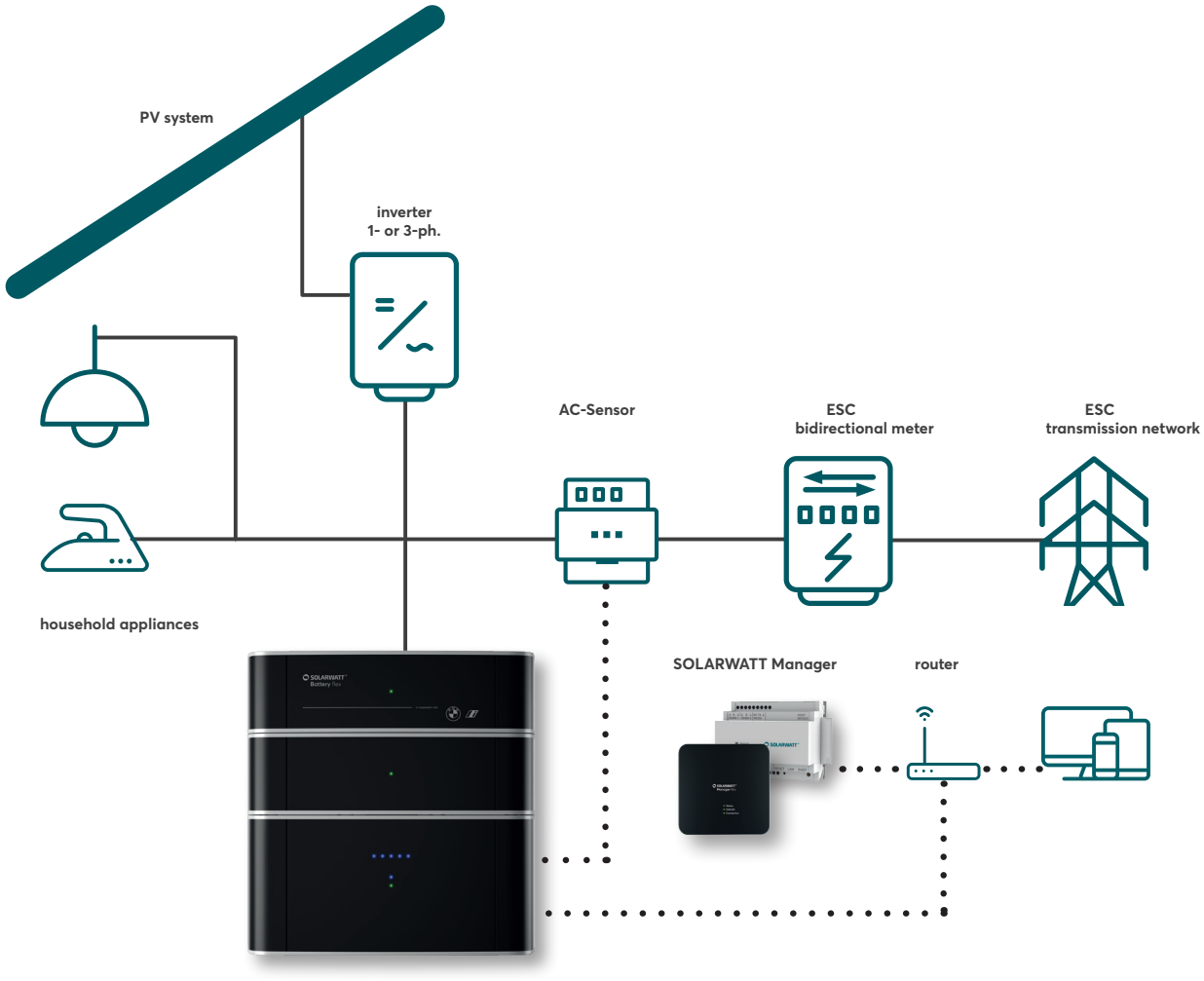
#01414 | Rev 12 | 21.07.2023

LIMITATION OF LIABILITY

Solarwatt assumes no liability for personal injury, damage to property or the product itself, or for consequential damages occurring as a result of non-compliance with these installation and operating instructions. Furthermore, no liability shall be assumed for damage to the product that is the result of or has been caused by improper use, repairs, opening the battery storage system, or due to any actions by unqualified persons who have not been certified by Solarwatt. This limitation of liability also applies to the use of unapproved replacement parts and failure to comply with the specified maintenance intervals. No unauthorized modifications or technical alterations may be made to the product.

BATTERY FLEX AC-1 – SHORT DESCRIPTION

Battery flex AC-1 is an AC-coupled lithium-ion battery storage system which can be extended with add-on modules and is designed to increase self-sufficiency with self-produced energy.
The system uses an external current sensor to detect energy demand and any surplus electricity generated by a photovoltaic system on site, for example.
The fully automatic control strategy ensures optimized self-sufficiency using your own electricity. When energy is acquired from the public grid, the battery storage system receives information on when to discharge to assist power supply from self-generated electricity. The battery storage system is charged as soon as excess energy is detected which cannot be consumed. Battery flex ensures a sustainable, reliable electricity supply in buildings ranging from single-family homes through to commercial properties.



SOLARWATT Battery flex AC-1

#01414 | Rev 12 | 21.07.2023

Security

SAFETY INSTRUCTIONS AND GENERAL SAFETY HAZARDS

HAZARD

Damage due to incorrect handling This symbol with the "Danger" warning indicates an imminent threat to life and physical well-being. Severe or life-threatening personal injury may be the result if this warning is disregarded.

- Only a trained, qualified electrician may put the Battery flex battery storage system into operation. There is a risk of electric shock.
- Animals, children, persons with reduced physical, sensory or mental capacities, and persons lacking sufficient experience and knowledge must not be left unattended in the vicinity of the device.
- Make sure that the device is properly attached to the wall.
- Do not clean the unit with alcohol or other chemical agents. Follow the instructions in the Cleaning/care and maintenance section when doing so.
- The maximum current and voltages characteristics according to the data sheet specifications of the respective product must be observed. Otherwise, the product can be damaged.
- Only use spare parts and accessories that are approved or recommended by Solarwatt.
- Always observe all applicable national standards and directives on the connection of battery storage systems.
- Repairs or system updates must be carried out by qualified personnel who are authorized and trained by Solarwatt.
- Electrical cables must be protected from improper use so that no damage can occur due to twisting, pinching or similar abuse. Do not use cracked or frayed electrical cables or plug connectors. Inspect electrical cables from time to time for damage and immediately decommission them if any defects are found.
- Never ground Battery flex with a lightning conductor, telephone wire or gas line.
- You must not dispose of the product in the household waste.
- The applicable disposal regulations in the respective country must be observed.
- Do not dispose of battery modules by burning them!
- Do not open or disassemble battery modules. Failure to observe these instructions will void the product warranty and can cause battery contents and decomposition products to escape, leading to reactions which may be harmful to the health and environment.
- Remember that charged capacitors pose an electrical hazard. A discharge time of 5 minutes must be observed after shutting down Battery flex before any work can be performed on the device.
- Do not expose the battery module to great heat or fire. This could cause irreversible damage to the battery.
- If the Battery flex battery storage system has been damaged due to improper use (e.g. dropped), it must not be put into operation
- Do not mount or install Battery flex when it is wet
- The intermediate seal on the battery plug of Battery flex base and Battery flex packs must not be damaged
- Be careful not to damage the battery plug by twisting it (e.g. by incorrectly attaching the modules to the wall bracket)
- Ensure that the battery plugs are connected correctly. An incorrect contact can cause a fire hazard
- Observe the following if the battery is exposed to fire and catches fire:
- The battery's primary products of combustion are carbon dioxide (CO2) and water vapor (H2O). Carbon monoxide (CO), hydrofluoric acid (HF) and many other gaseous by-products are released in much smaller amounts. In some cases, nickel oxide, cobalt oxide or manganese oxide (in the case of NMC cells) may be separated.
- Electrical misuse through tampering, exposure to extreme environmental conditions (such as high temperatures or contact with chemicals) or heavy mechanical loads (such as deformation, manipulation or opening the housing) may cause a violent reaction in the battery cells stored, causing intense heat development and gas emissions. This may cause the materials contained in the battery module, as well as their combustion products, to be released into the ambient air in the form of dust.
- The battery terminals and pressure equalizing membrane of the battery module must not be damaged.
- You must observe the temperature limits for Battery flex pack regarding its transport, storage and operation (see data sheet).
- Do not short-circuit batteries.
- Battery modules may not be opened or deformed. Exposed electrolyte is hazardous for the skin and eyes.
- Do not manipulate the communication interface on the Battery flex pack and Battery flex base.

#01414 | Rev 12 | 21.07.2023

SYMBOLS

General

HAZARD

This symbol with a "Danger" warning indicates an imminent threat to life and physical well-being. If this notice is disregarded, severe or life-threatening personal injury can occur.

IMPORTANT

This symbol indicates situations which are dangerous to people and/or the product. Disregarding this notice may result in personal injury or equipment damage.

NOTE

This notice provides recommendations for use and helpful tips.

#01414 | Rev 12 | 21.07.2023

NAMEPLATES

SOLARWATT®
Battery flex

SOLARWATT GmbH
Maria-Reiche-Straße 2a
D-01109 Dresden
www.solarwatt.com

model	Battery flex base AC-1 1.3 (6.0 kW)
type	Battery Inverter non-isolated
rated power charging/ discharging	6.0 kW
a.c. voltage	230 V ± 10%
a.c. rated current	26 A
nominal frequency	50 Hz
apparent power	6.0 kVA
power factor	0.8-1.0
d.c. voltage	25-350 V
d.c. rated current	30 A
mass	23 kg
protective class	I
overvoltage category	III
ambient temperature	-20°C to +55°C
relative humidity	≤ 100%
IP rating	54

only valid for CEI 0-21

number of packs	battery-energy kWh	nominal power kW
2	4.8	1.4
3	7.2	2.1
4	9.6	2.8
5	12	3.5
6	14.4	3.9
7	16.8	5.0
8	19.2	6.0

WARNING!
Refer to Installation and Operation Manual before installing, operating or servicing this unit. DO NOT connect or disconnect plug contacts while system is under load current. Failure to comply can result in a danger situation!
DANGER!

SOLARWATT®
Battery flex

SOLARWATT GmbH
Maria-Reiche-Straße 2a
D-01109 Dresden
www.solarwatt.com

model	Battery flex middle pack 1.3 (2.4kWh, 30A)
type	Li-Ion Battery Module rechargeable
voltage range (min/max)	25.2 V - 33.2 V
rated voltage	29.2 V
max current	30 A
energy	2.7 kWh
capacity	93 Ah
ambient temperature	-20°C to + 55°C
relative humidity	≤ 100%
IP rating	54
weight	25 kg
Battery designation acc. to IEC 62620	INP43/174/92/(8S)M/+5+60/95

UN 3480

WARNING!
Refer to Installation and Operation Manual before installing, operating or servicing this unit. DO NOT connect or disconnect plug contacts while system is under load current. Failure to comply can result in a danger situation!
DANGER!

SOLARWATT®
Battery flex

SOLARWATT GmbH
Maria-Reiche-Straße 2a
D-01109 Dresden
www.solarwatt.com

model	Battery flex top pack 1.3 (2.4kWh, 30A)
type	Li-Ion Battery Module rechargeable
voltage range (min/max)	25.2 V - 33.2 V
rated voltage	29.2 V
max current	30 A
energy	2.7 kWh
capacity	93 Ah
ambient temperature	-20°C to + 55°C
relative humidity	≤ 100%
IP rating	54
weight	25 kg
Battery designation acc. to IEC 62620	INP43/174/92/(8S)M/+5+60/95

UN 3480

WARNING!
Refer to Installation and Operation Manual before installing, operating or servicing this unit. DO NOT connect or disconnect plug contacts while system is under load current. Failure to comply can result in a danger situation!
DANGER!

#01414 | Rev 12 | 21.07.2023

SYMBOLS ON NAMEPLATES AND LABELS

	You must not dispose of the product in the household waste. The applicable disposal regulations in the respective country must be observed.
	Batteries can be returned to the point of sale free of charge. You must not dispose of the product in the household waste. The applicable disposal regulations in the respective country must be observed.
	This operating manual must be read prior to installation or commissioning.
	The relevant device equipment conforms to the requirements specified in EU Directives.
	The relevant device equipment conforms to the requirements specified in UK Directives.
	RCM (Regulatory Compliance Mark) The product meets the requirements specified in the applicable Australian standards.
IP54	Battery flex is protected against dust in harmful quantities and guarantees complete protection against contact and splashing water on all sides.
	Warning of oxidizing substances.
	Charged capacitors pose an electrical hazard. A discharge time of 5 minutes must be observed
	Warning of dangerous electrical voltage.
	Warning of danger from batteries.
UN 3480	The relevant device equipment conforms to the requirements specified in UN hazardous goods number UN3480.
	Bluetooth communication
	Installation and maintenance must be carried out by a qualified electrician who has been certified by Solarwatt.
	Protection class 1

#01414 | Rev 12 | 21.07.2023

INTENDED USE

Battery flex AC-1 is designed and used exclusively for storing electrical energy. You must observe all technical data on the technical data sheet. Using the Battery flex AC-1 improperly or for purposes other than its intended use can cause defects in the device and/or lead to life-threatening situations. and renders the warranty null and void.

IMPROPER USE

- Do not use Battery flex in vehicles (motor vehicles, aircraft or ships)
- Do not use Battery flex as an uninterruptible power supply (UPS)
- Do not use Battery flex to operate medical equipment
- Do not use Battery flex to operate devices for which functional reliability must be guaranteed

Any manipulation/modification of the Battery flex communication system will void any warranty claims. Refer to the data sheets of the respective components for information about the climatic installation, storage and transport conditions. Disregarding the information provided in this installation and operating manual will void any warranty claims.

REQUIREMENTS FOR INSTALLERS

Battery flex AC-1 may only be installed and put into operation in compliance with these installation and operating instructions by trained technical staff who meet the following criteria:

- Authorized by Solarwatt
- Trained electronics technicians, electricians or other specialists with similar qualifications
- Authorized professionals with thorough knowledge of all applicable standards, directives and laws
- Technical staff who have taken part in a product-specific certification training course by Solarwatt

#01414 | Rev 12 | 21.07.2023

REQUIRED TOOLS, RESOURCES, AND INSTALLATION MATERIALS

- Spirit level and yardstick
- Stripping tongs
- Wire stripper, wire cutter
- Diagonal cutter
- Drill/screwdriver
- Torx screwdriver (TX30 and TX25)
- Allen key, 4 mm
- Torque wrench
- Anchors (10 mm Ø) and screws (8 mm Ø) to fasten the wall bracket (depending on the fastening surface)
- Single-pole automatic circuit breaker (as per the following table) to protect the Battery flex base AC-1 power supply

Battery flex pack	Max. discharge capacity	**Minimum** fuse Line protection (not included in the scope of delivery)
2	1900 W	16 A
3	2800 W	16 A
4	3800 W	20 A
5	4600 W	20 A
6	5700 W	25 A
7	6000 W	32 A
8	6000 W	32 A

- Installation cable/line for AC connection (3x4mm² or 3x6mm², outer diameter 9-12 or 15-16 mm)
- CAN cable: min. Cat5.e; outer diameter 5-8 mm with twisted-pair wires (patch cable) or, alternatively, network installation cable, and 2 self-terminating RJ45 plugs; weather-resistant for outdoor installation
- LAN cable: min. Cat5.e for LAN, outside diameter 5-8 mm, weather-resistant for outdoor installation
- Mobile end device with the SOLARWATT Pro app
- For optional ground mounting kit:
  - Wrench, M16
  - Allen key, 5 mm

NOTE

Battery flex AC-1 1.3 has a fault current circuit breaker/RCD type B 30 mA integrated.

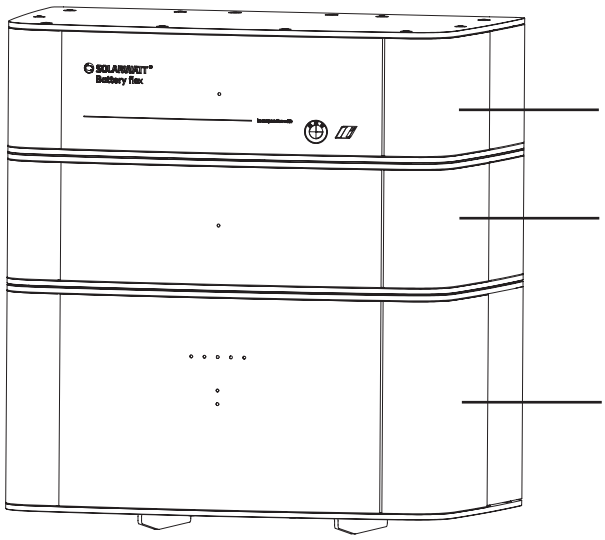
#01414 | Rev 12 | 21.07.2023

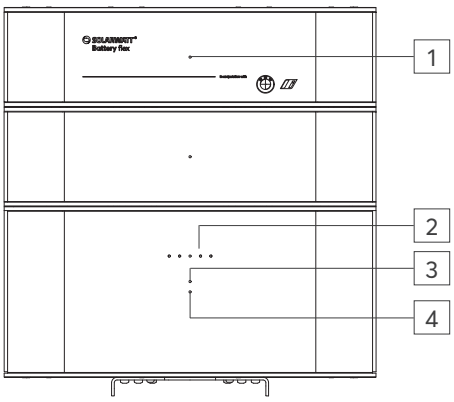
System design

OVERALL SYSTEM DESIGN

The Battery flex AC-1 system consists of the main components Battery flex base AC-1, a single-phase battery inverter for AC-side integration, and the Battery flex pack battery modules. The battery modules are available in the variants Battery flex middle pack and Battery flex top pack.
The Battery flex AC-1 battery inverter can be used to operate two to eight Battery flex pack battery modules. It is essential to ensure that at least one top pack and at least one to seven middle packs can be installed.

Each battery module has a usable quantity of energy of 2.4 kWh. System performance during charging and discharging is scaled by serial integration of the battery modules based on the number of battery modules.
The system is attached to a wall using the supplied wall bracket. Solarwatt offers an optional bracket for floor mounting.





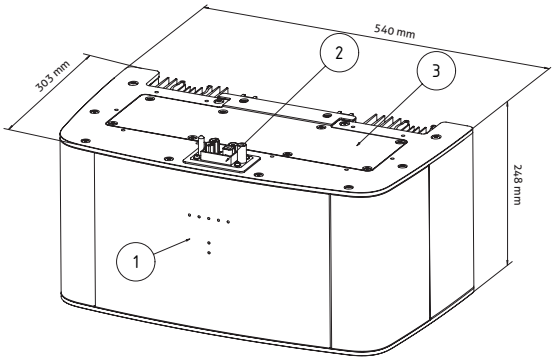
1 Batterie LED
2 Performance LEDs
3 Bluetooth LED
4 Status LED

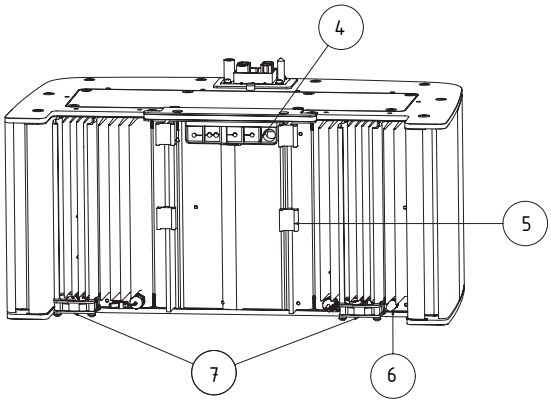
#01414 | Rev 12 | 21.07.2023

BATTERY FLEX BASE AC-1 DESIGN

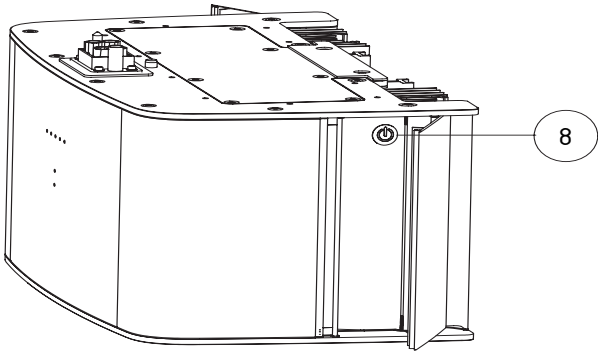
NOTE

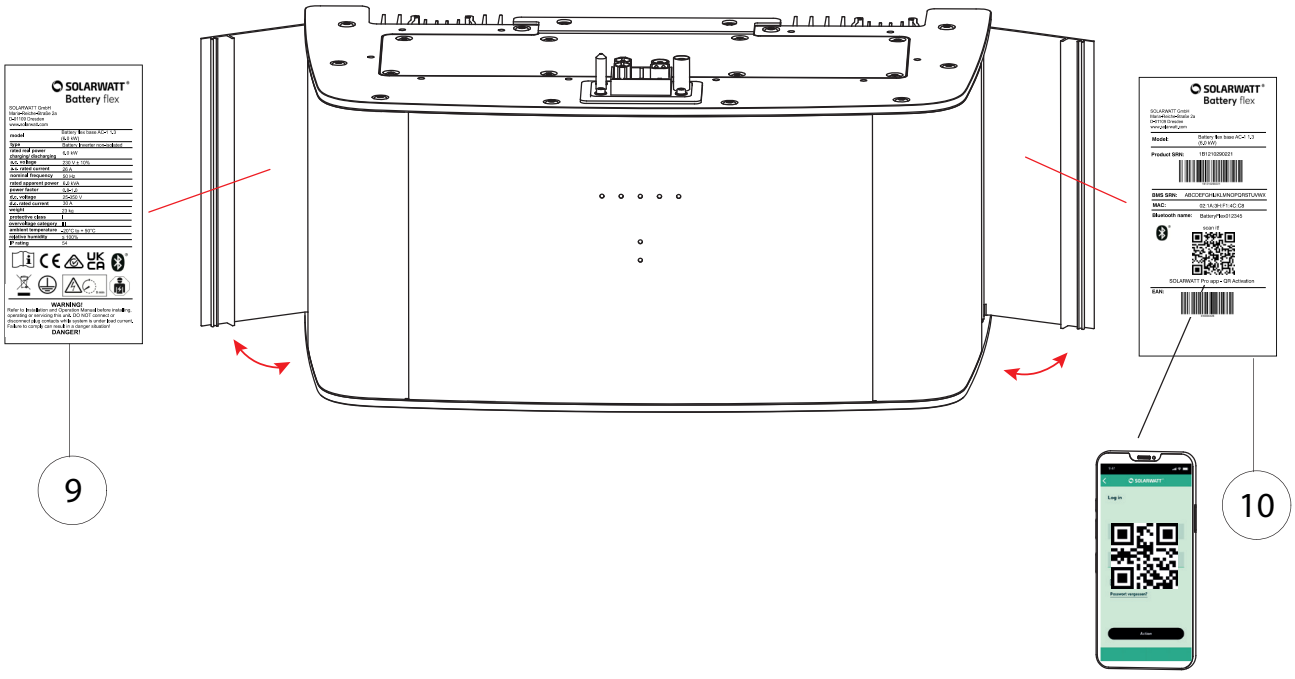
Battery flex base AC is a transformerless battery inverter.





1	LED indicator
2	Battery connector plug
3	Cover connection section
4	Cable feed-through
5	Mounting bracket
6	Bluetooth antenna
7	Fans
8	Device switch
9	Nameplate
10	Serial number label





#01414 | Rev 12 | 21.07.2023

SCOPE OF DELIVERY FOR BATTERY FLEX BASE AC-1

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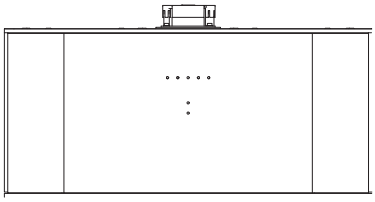

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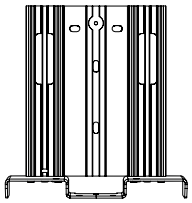

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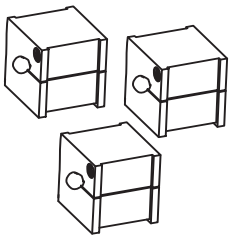

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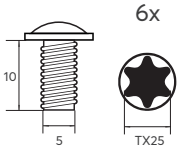

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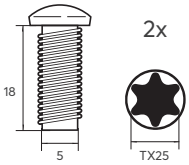

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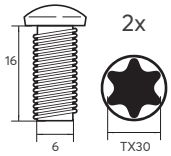

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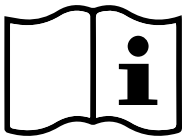
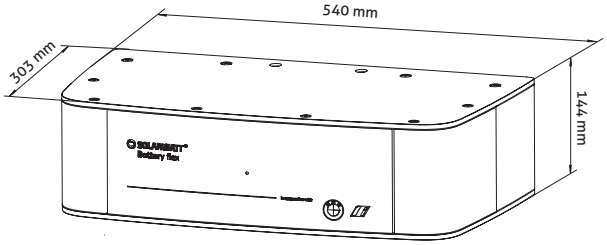


1	Battery flex base AC-1
2	Wall bracket for Battery flex base AC-1
3	Grommet set for Battery flex base AC-1
4	6x flat pan head screws, M5x10 TX25 (to use for the cover of the cable compartment of battery flex base)
5	2x self-tapping pan head screws, 50x18 TX25 (to be used for the cover of the cable compartment of battery flex base)
6	2x pan head screws, M6x16 TX30 (to be used for the bottom of battery flex base)
7	Documentation

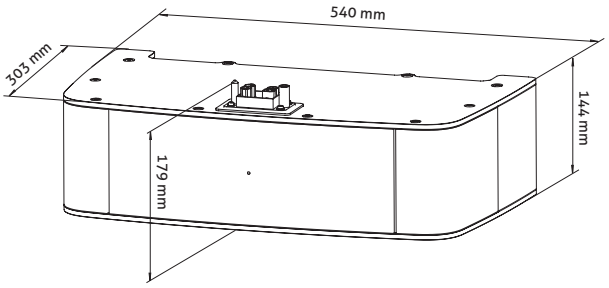
#01414 | Rev 12 | 21.07.2023

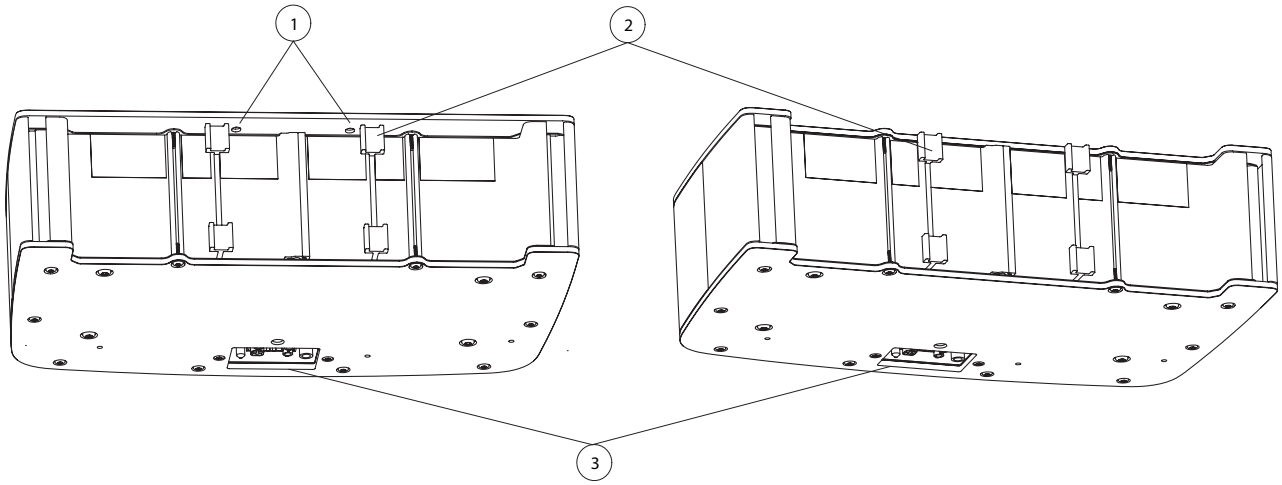
BATTERY FLEX PACK DESIGN

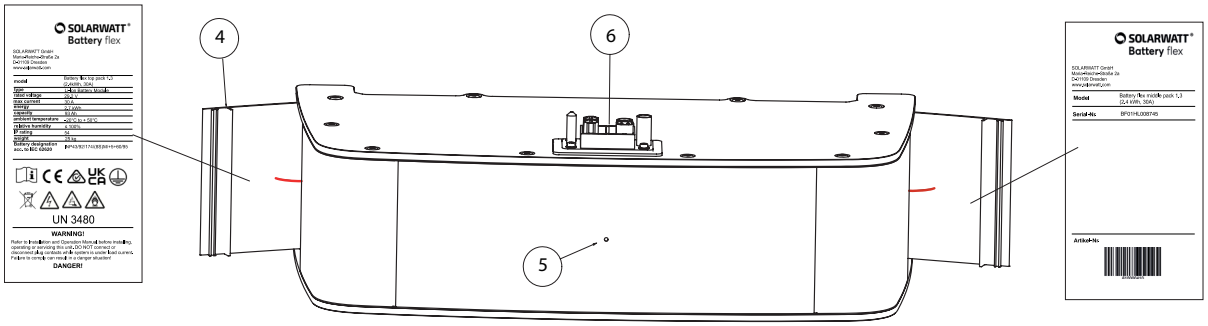
Battery flex top pack



Battery flex middle pack







1 Opening for screws for fixing top pack or optional anti-theft device

2 Mounting bracket

3 Battery socket

4 Hinged door

5 LED indicator

6 Battery plug

#01414 | Rev 12 | 21.07.2023

NOTE

The Battery flex pack has a SoC (state of charge) of approx. 25% when delivered.

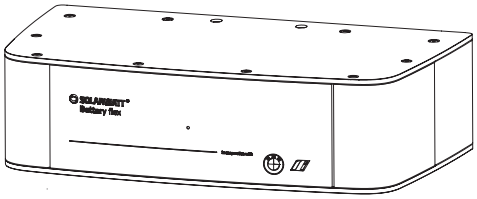
NOTE

No hazards will arise if the Battery flex pack battery module is used for its intended purpose and as per the handling instructions, and provided that the battery module housing which encloses the lithium-ion cells it contains is not damaged. The substances contained in the Li-ion cells, which are hazardous to some extent, will be enclosed safely provided the module is used as intended.

Use the Battery flex pack battery module in conjunction with the Battery flex base battery inverter only. The specified operating conditions concerning charging, discharging, storage, temperatures, and air humidity must be met as per the instructions on the relevant data sheets.

SCOPE OF DELIVERY FOR BATTERY FLEX TOP PACK

1



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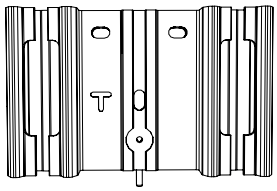

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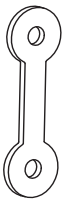

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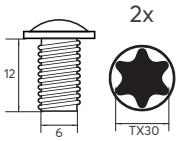


5

1 Battery flex top pack

2 Wall bracket for Battery flex top pack (marked with the letter T)

3 Connector

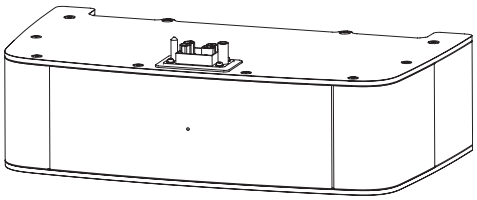
4 2x flat pan head screws, M6x12 TX30 (to fix the connector of the wall bracket)

5 Safety instructions

#01414 | Rev 12 | 21.07.2023

SCOPE OF DELIVERY FOR BATTERY FLEX MIDDLE PACK

1



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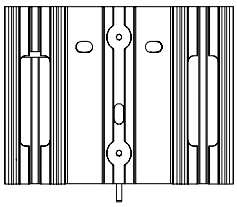

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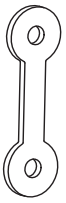

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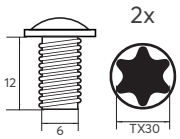

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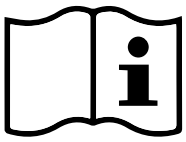


1 Battery flex middle pack

2 Wall bracket for Battery flex middle pack

3 Connector

4 2x flat pan head screws, M6x12 TX30
(to fix the connector of the wall bracket)

5 Safety instructions

#01414 | Rev 12 | 21.07.2023

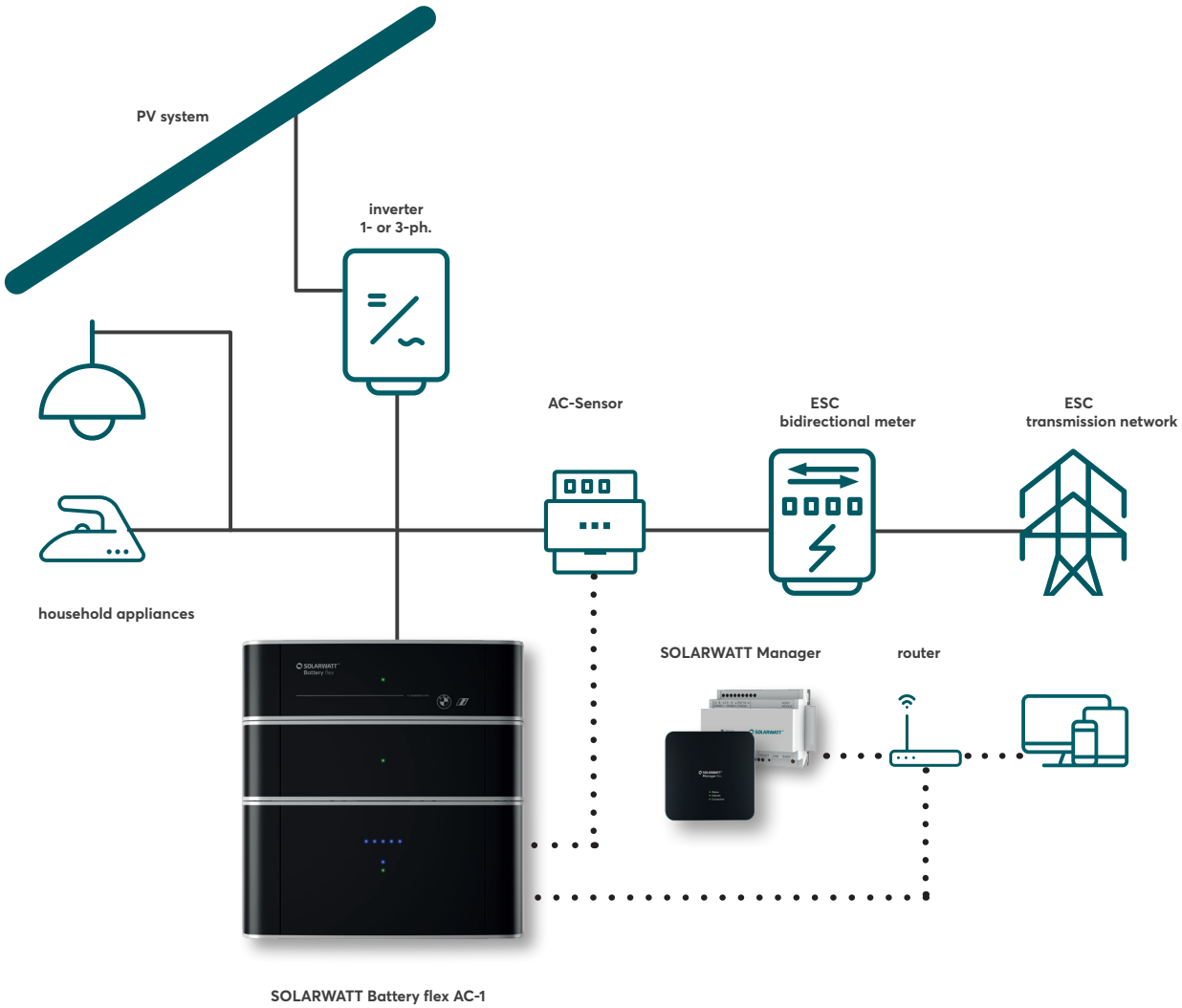
Installation of the AC Sensor

The AC Sensor Flex (ACS) records the electrical output for feed-in and purchase and sends this information to the Battery flex, which is controlled based on this information. When seen from the household fuse, the ACS is installed directly downstream of the power supply company meter.

5 Safety rules

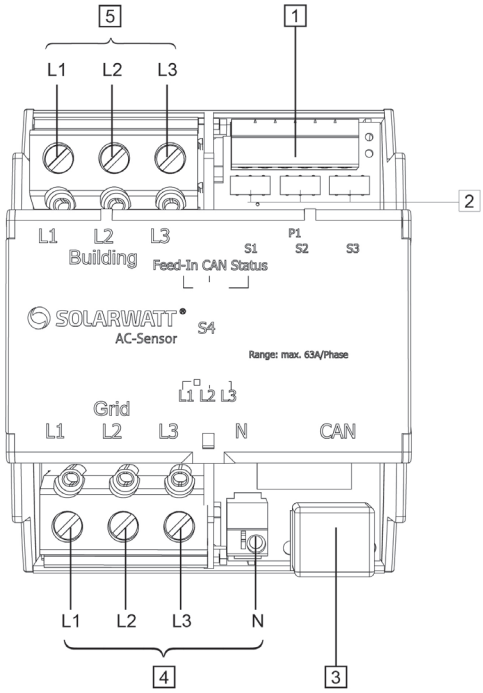
Follow lock out steps:

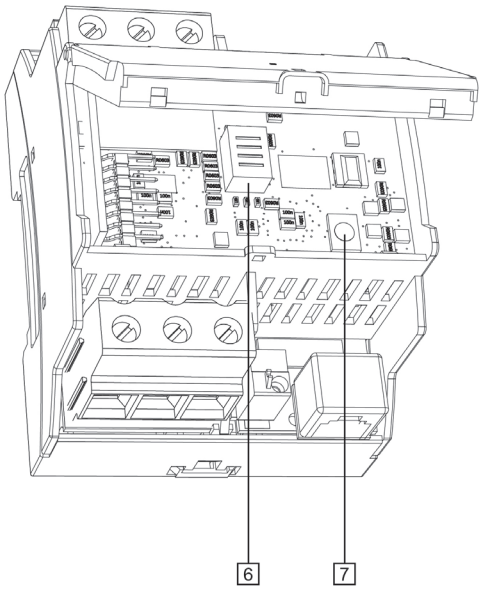
- Verify absence of voltage
- Lock out isolator(s)
- Disconnect
- Ground and short circuit as required
- Provide protection from adjacent live parts



SOLARWATT Battery flex AC-1

#01414 | Rev 12 | 21.07.2023





1 External transducer connection

2 DIP switches S1, S2, S3
Activate transformer measurement

3 CAN connection for Battery flex AC-1 (RJ45)

4 Mains-side connection

5 Building-side connection

6 DIP switch S4
Current transformer ratio setting

7 Reset switch for restart

IMPORTANT

Damage or destruction of the AC Sensor due to improper use

Connecting the mains voltage to the CAN bus terminals can damage or destroy the device. The device can be damaged or destroyed if operated outside the ranges specified in the technical data.

HAZARD

Life-threatening hazard due to electric shock

The live parts carry extremely dangerous voltages. Use the AC Sensor in dry environments only and keep away from liquids. Only operate the AC Sensor behind a cover panel or shock-proof protection in the switch cabinet. Disconnect the AC Sensor from the power before cleaning and only use a dry cloth to clean.
Extremely dangerous voltage runs through the household junction box. Disconnect the connection point and secure against re-connection. Ensure that the conductors that are connected to the AC Sensor or should be disconnected from it are actually de-energized.

#01414 | Rev 12 | 21.07.2023

ESTABLISHING CAN COMMUNICATION BETWEEN BATTERY FLEX BASE AND ACS

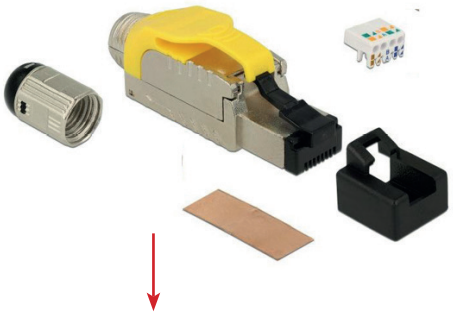
- Establish CAN connection between the Battery flex base and ACS using a patch cable

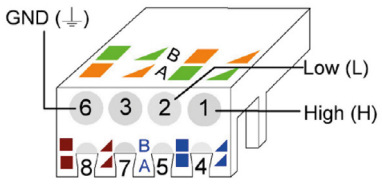
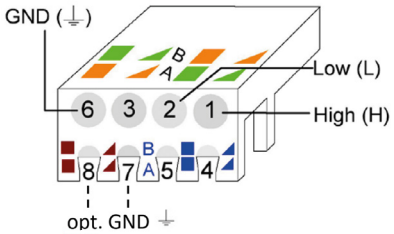
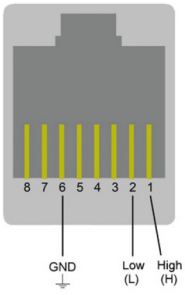
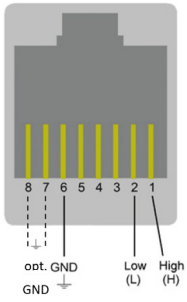
NOTE

It is mandatory to use a network cable (at least Cat.5e) for CAN communication between the AC Sensor and the Battery flex base because the high and low signal wires need to be twisted together. Max. possible cable length is 25 m.

NOTE

If you use a network installation cable instead of a patch cable, the corresponding attachable RJ45 plugs are available from the Solarwatt web shop (DELOCK 86287 RJ45 plugs).
Make sure that the wires H (wire 1), L (wire 2) and GROUND (wire 7 or 8) are connected to the Battery flex base and to the AC Sensor using the same assignment configuration (see diagram below).

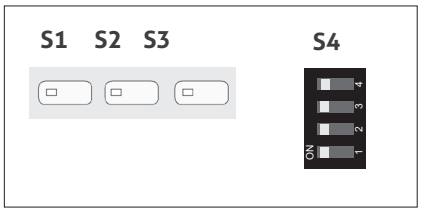


	AC-Sensor Flex	Battery flex AC-1
RJ45-plug		
RJ45-socket		

#01414 | Rev 12 | 21.07.2023

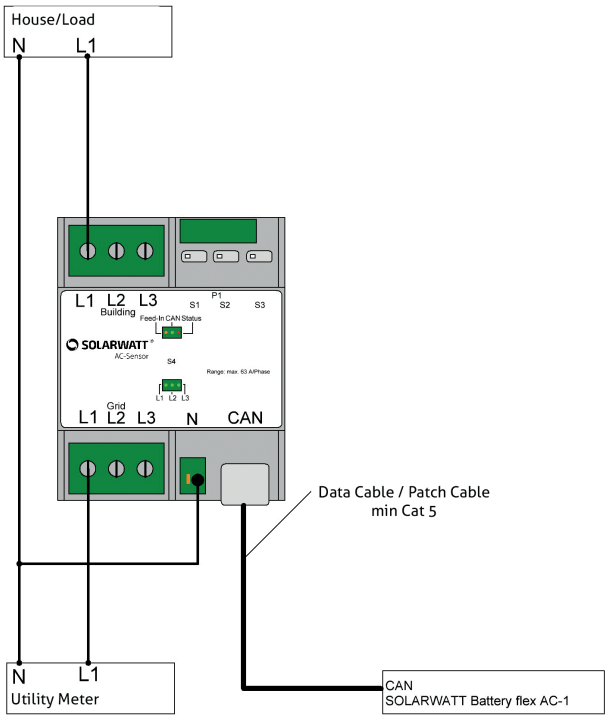
DIRECT MEASUREMENT

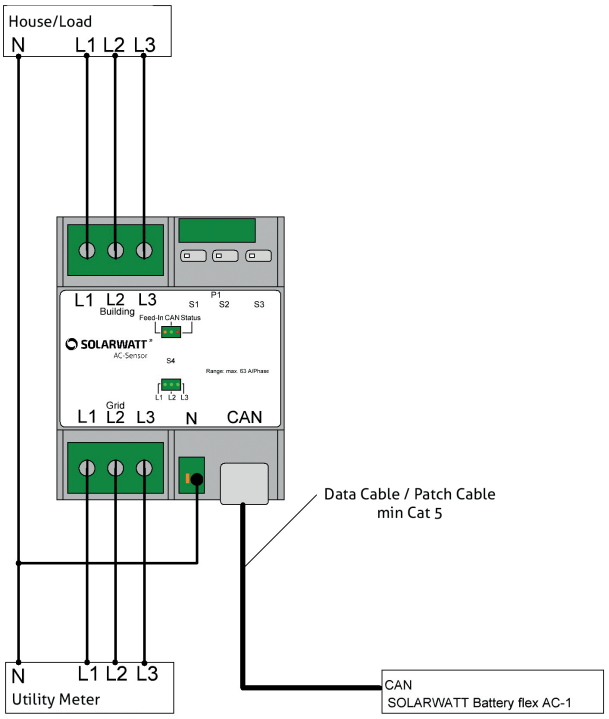
- Fit the AC-Sensor Flex to top hat rail. To do so, hook the device on the upper edge of the top-hat rail and press down until it clicks into place.
- Connect AC-Sensor as per the diagrams below ("AC-Sensor Flex only" and "Inverter, AC-Sensor Flex and Battery flex AC-1")"
- Check the setting on the DIP switches S1, S2, S3 and the DIP switch S4 (see diagram of AC Sensor layout for position of switches)



- Close/secure the housing cover with one of the enclosed cable ties

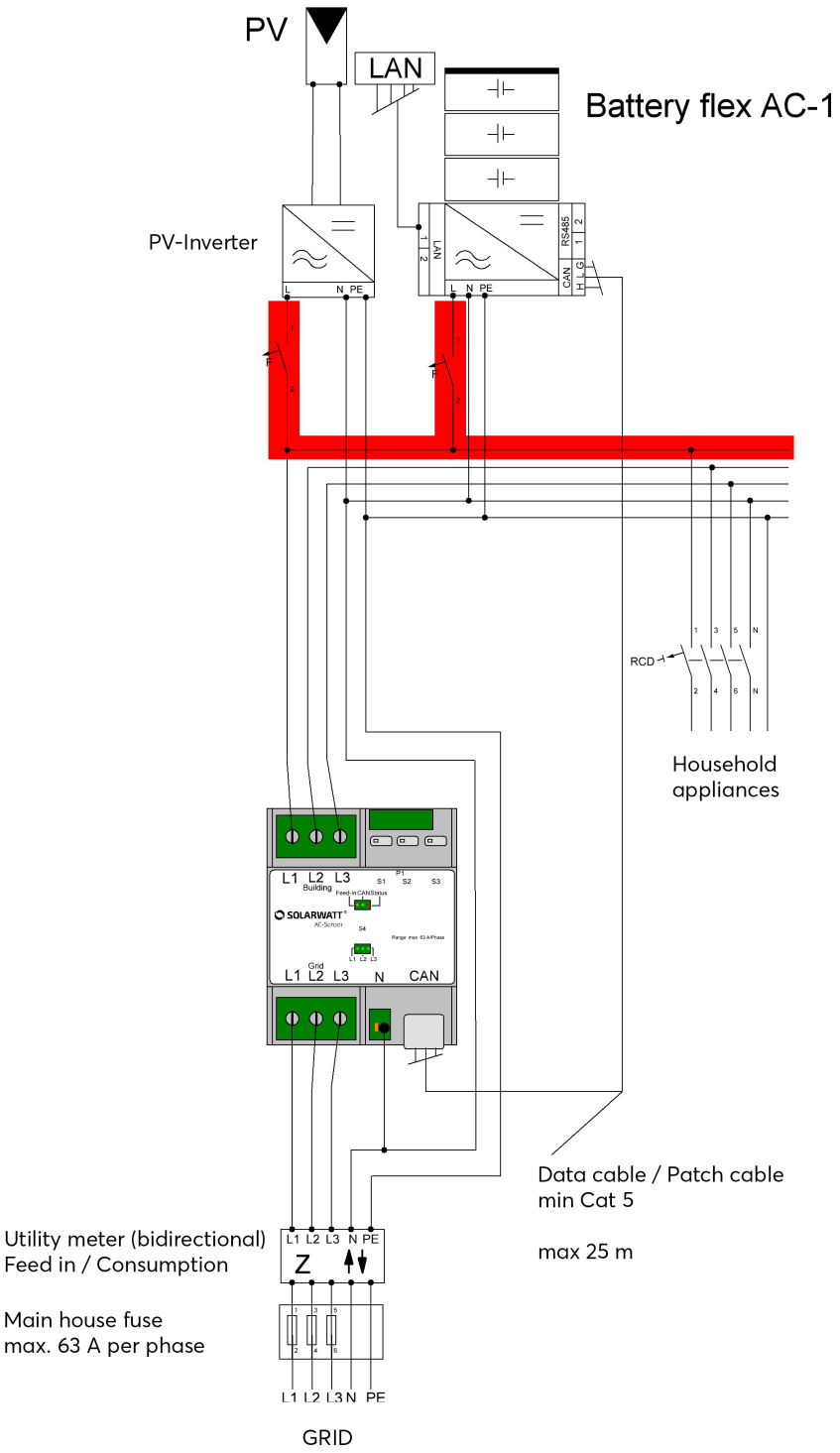
AC-Sensor Flex only (1-phase, 3-phase)





#01414 | Rev 12 | 21.07.2023

Inverter (1-phase), AC Sensor Flex and Battery flex AC-1

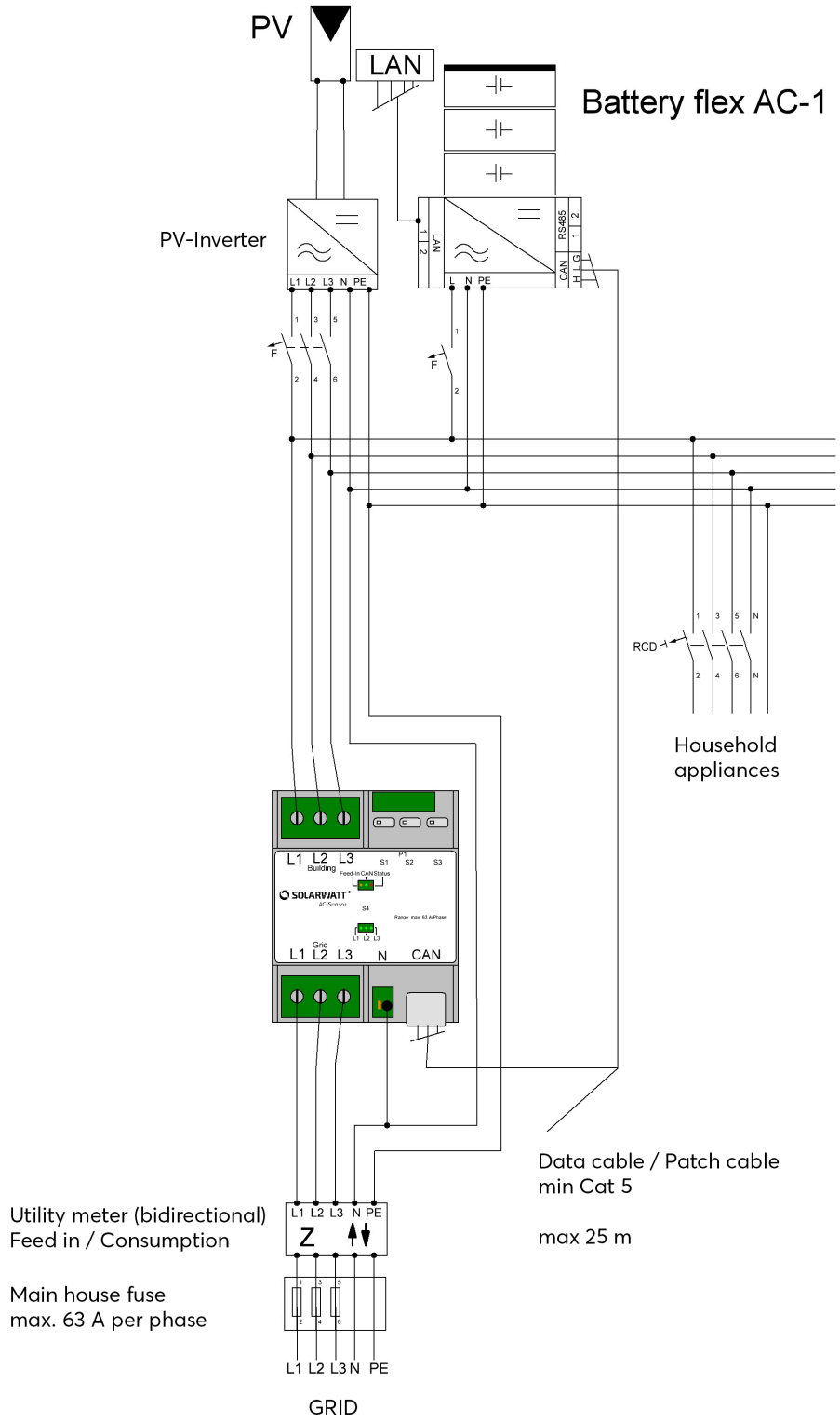


NOTE

In the case of single-phase inverters: only install Battery flex AC-1 in a phase which also contains an inverter. Take into account the phase imbalance requirements.

#01414 | Rev 12 | 21.07.2023

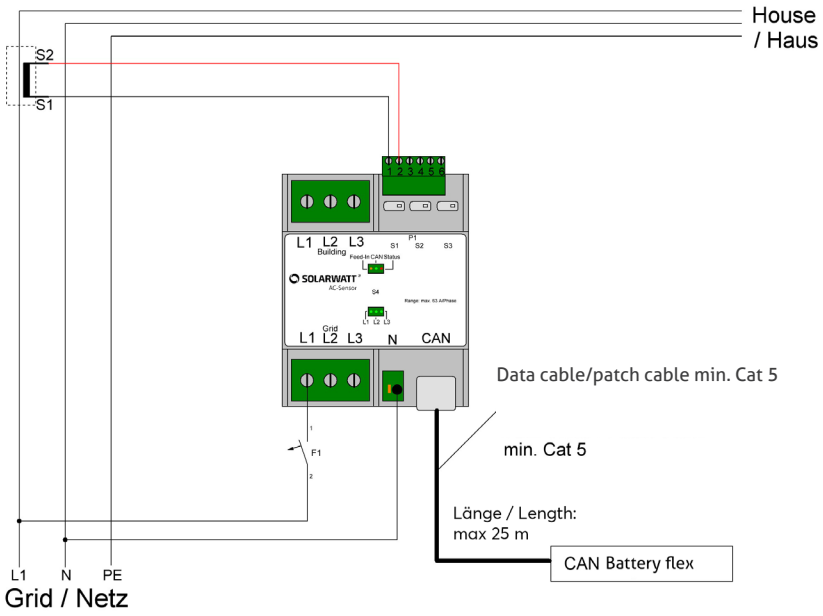
Inverter (3-phase), AC-Sensor Flex and Battery flex AC-1



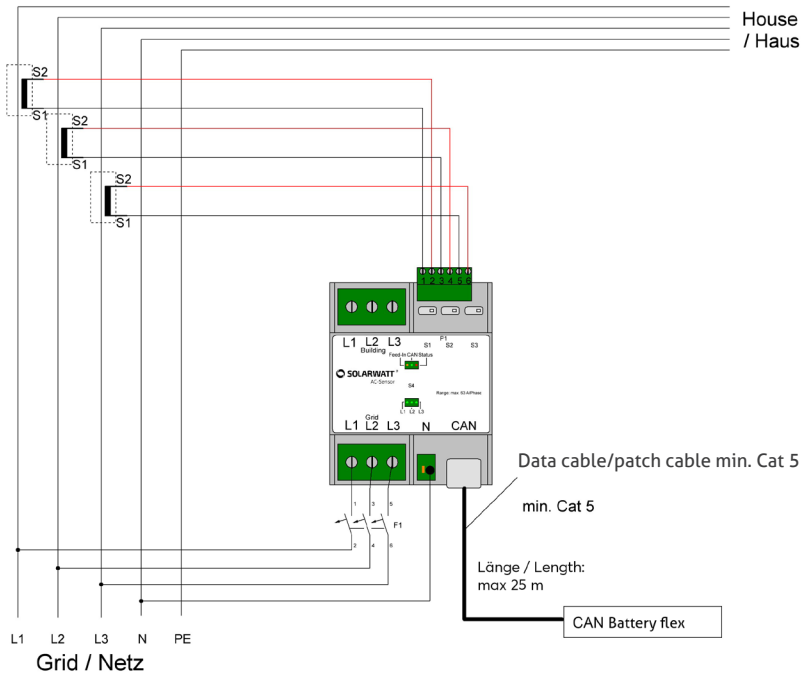
TRANSFORMER MEASUREMENT

- Fit the AC-Sensor to top hat rail. To do so, hook the device on the upper edge of the top-hat rail and press down until it clicks into place.
- Connect AC-Sensor as per the diagrams below ("AC-Sensor Flex only", "AC-Sensor Flex and Battery flex AC-1")
- Select the fuse protection for the power supply lines based on the cable cross-section used.

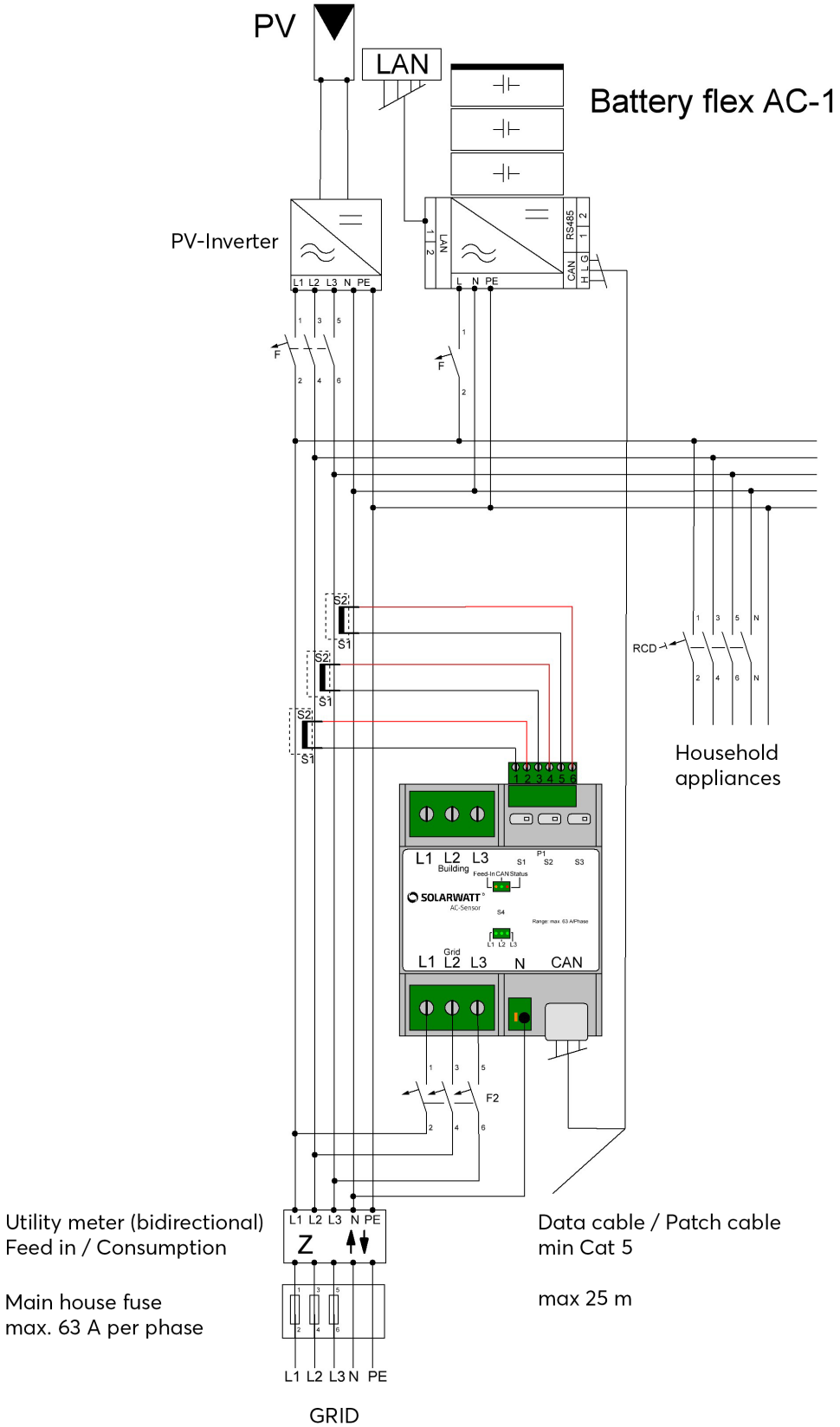
AC-Sensor Flex only (1-phase)



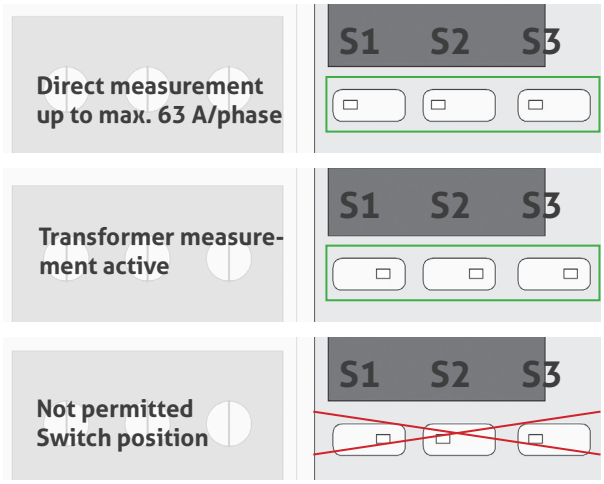
AC-Sensor Flex only (3-phase)

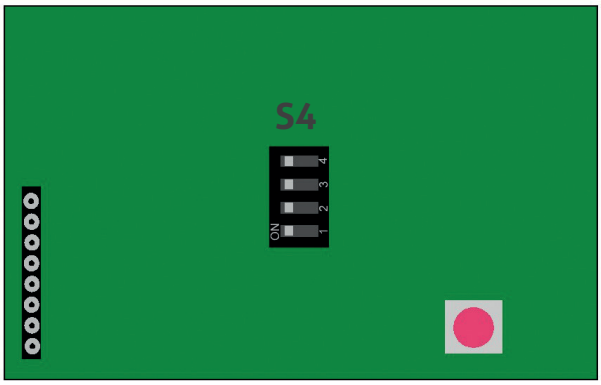


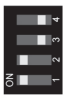
#01414 | Rev 12 | 21.07.2023

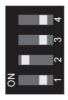


- Activate converter measurement using DIP switches S1, S2 and S3 (see diagram of AC-Sensor design for position of switches). All switches must be in the same position during activation (see diagram on left).
- Adjust the ratio of the current transformers using DIP switch S4 (under the cover of the AC-Sensor – see diagram for AC-Sensor design)
- See table for settings details
- Close/secure the housing cover with one of the enclosed cable ties





			measurement
4	EIN		direct measurement max. 63 A / phase
3	EIN		
2	EIN		
1	EIN		
4	AUS		75 A / 1 A transformer clamp
3	EIN		
2	EIN		
1	EIN		
4	EIN		100 A / 1 A transformer clamp
3	AUS		
2	EIN		
1	EIN		
4	AUS		150 A / 1 A transformer clamp
3	AUS		
2	EIN		
1	EIN		
4	EIN		200 A / 1 A transformer clamp
3	EIN		
2	AUS		
1	EIN		
4	AUS		250 A / 1 A transformer clamp
3	EIN		
2	AUS		
1	EIN		
4	EIN		300 A / 1 A transformer clamp
3	AUS		
2	AUS		
1	EIN		
4	AUS		400 A / 1 A transformer clamp
3	AUS		
2	AUS		
1	EIN		

			measurement
4	EIN		500 A / 1 A transformer clamp
3	EIN		
2	EIN		
1	AUS		
4	AUS		1000 A / 1 A transformer clamp
3	EIN		
2	EIN		
1	AUS		
4	EIN		1500 A / 1 A transformer clamp
3	AUS		
2	EIN		
1	AUS		
4	AUS		2000 A / 1 A transformer clamp
3	AUS		
2	EIN		
1	AUS		
4	EIN		2500 A / 1 A transformer clamp
3	EIN		
2	AUS		
1	AUS		
4	AUS		3000 A / 1 A transformer clamp
3	EIN		
2	AUS		
1	AUS		
4	EIN		4000 A / 1 A transformer clamp
3	AUS		
2	AUS		
1	AUS		
4	AUS		4500 A / 1 A transformer clamp
3	AUS		
2	AUS		
1	AUS		

NOTE

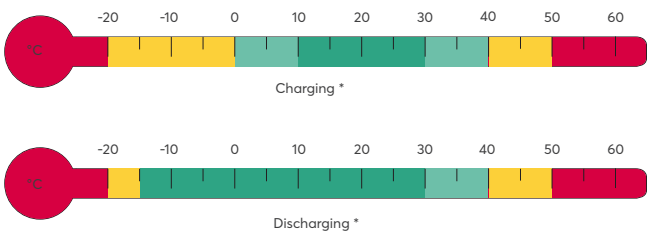
The current transformers must have a secondary current ≤ 1 A and a minimum output power of 0.2 VA.

#01414 | Rev 12 | 21.07.2023

Installation

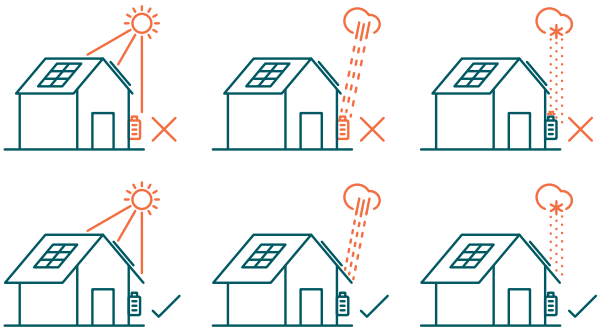
REQUIREMENTS FOR THE INSTALLATION LOCATION

- Installation in air-conditioned interior rooms and protected exterior areas
- Operating temperature -20 °C to 55 °C
- Ambient temperature for optimum operation 10 °C to 30 °C (min 0 °C)
- Do not expose the product to direct sunlight.
- Do not install the product on escape routes or in bedrooms
- Battery flex must not obstruct access to shut-off devices on the installation site
- Install the product so that it is not accessible to children, mentally disabled persons, or animals
- The installation location must be chosen in such a way that the product will not be exposed to flooding; this must be ensured by installing it at an adequate height (at least 10 cm) and at a suitable drainage-free or inflow-free installation location
- Do not store any flammable or explosive materials in the installation room
- It is not permitted to install the product in boiler rooms (defined as solid fuel heating systems with a total rated output of more than 50 kW that may not be used for any other purposes), oil or wood storage facilities, wooden barns and sheds, etc.
- Do not use Battery flex in vehicles (motor vehicles, aircraft or ships)
- Do not use Battery flex in areas which are prone to explosion (flour dust, saw dust, etc.)
- Do not install Battery flex in locations over 2000 m above sea level
- Do not install Battery flex in atmospheres that are corrosive or contain ammonia and do not store corrosive or flammable materials in the surrounding area
- Do not install Battery flex near heat sources, in areas at risk of fire, or in environments containing moisture/atmospheres with a high salt content
- The wall and fastening material must be able to bear a static load equal to the specified product weight
- To ensure that the cooling air can escape unhindered from the device, the distance to adjacent equipment must not be less than 15 cm. A free space of at least 30 cm in height must be provided above the housing
- A free area of approx. 120 cm depth is required in front of the device to allow installation and maintenance work to be carried out on the front side
- Do not place Battery flex above or below other equipment
- Avoid direct heat exposure from other devices and maintain a minimum clearance gap to adjacent devices as stipulated by the manufacturer concerned
- You must observe minimum clearance gaps to ensure access to the device switch and nameplate through the hinged doors on the side
- Max. permitted incline for the installation wall +/- 10°
- When installing with stand mounting kit, ensure a sufficiently firm and plane ground in order to avoid the risk of tipping over



Battery flex AC-1 - recommended temperature range for optimum operation
Battery flex AC-1 provides at least 50 % of the charging or discharging power
Battery flex AC-1 provides a maximum of 50 % of the charging or discharging power
No operation

*) The actual charging and discharging power depends on the state of charge, the operating temperature and the operating time of the storage system and may deviate from the specified values

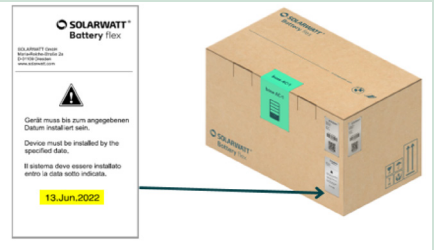


#01414 | Rev 12 | 21.07.2023

BEST-BEFORE DATE BATTERY FLEX BASE

IMPORTANT

Best-before date
The Battery flex base has a best-before date and must be installed by the specified date.

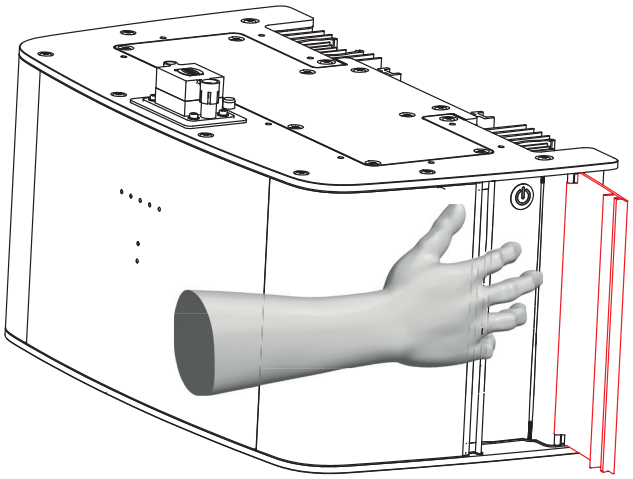


NOTE

If a Battery flex base has to be switched off for **more than one week** after the first startup e.g. because of a pending meter reset by the utility company - leave the base completely switched on but disconnect the CAN connector at the AC sensor. This way the control of the base is supplied from the mains (standby) but neither charging nor discharging takes place.

If the Battery flex base is to remain **completely disconnected from the AC mains** for a longer period of time after initial commissioning, this is only permissible for a total period of **maximum 6 months**. After installation, however, the Battery flex base AC-1 must remain switched on for **at least 24 hours**. After that, it can be switched off for **up to 2 months**. If a shutdown beyond 2 months is necessary, the base-internal backup cell must be recharged by switching on the Battery flex base AC-1 for **at least 48 hours**. This procedure must be repeated after another 2 months if the shutdown continues.

CARRYING AND SETTING DOWN



- Open hinged doors
- Use recessed grips to carry the devices

NOTE

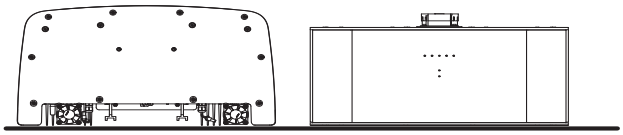
Make sure that you do not accidentally press the device switch during transport. The built-in internal battery will discharge if the device switch remains lit for a long period of time. Servicing may be required as a result.

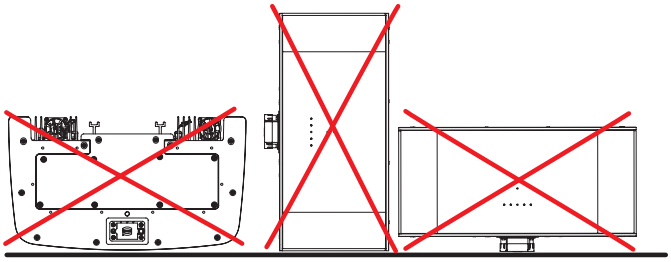
#01414 | Rev 12 | 21.07.2023

IMPORTANT

Damage to the device

Do not place the devices upside down, on their side or face down.





SWITCH ON AND SWITCH OFF SEQUENCE

To avoid a service event, always follow this sequence when switching the device on and off:

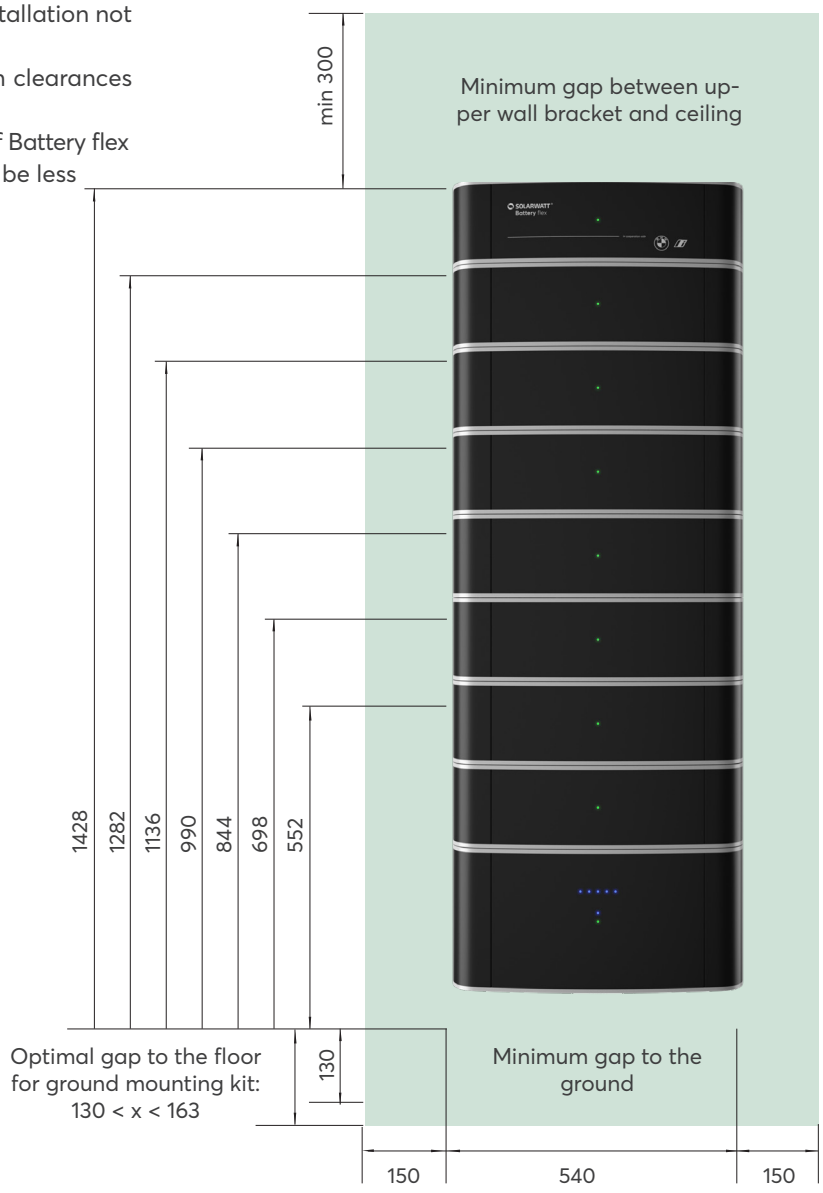
Switch on
1. Switch on AC-side fuse
2. Press device switch of the base

Switch off
1. Press device switch of the base
2. Switch off AC-side fuse

IMPORTANT

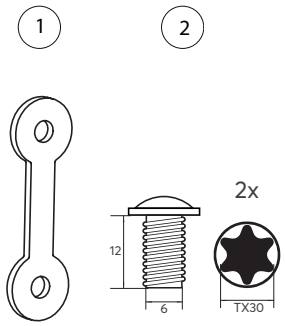
Ensure that the wall and the fastening materials can bear a static load corresponding to the specified product weight.
Max. permitted incline for the installation wall: +/- 10°
Weight of Battery flex base AC-1: 23 kg
Weight of Battery flex middle/top pack (2.4 kWh, 30 A): 25 kg
Ensure beforehand that the electrical cable is installed along the planned drilling points.

- Plan and prepare mounting (screws for installation not included in delivery)
- Observe the required space and minimum clearances (see diagram, specifications in mm)
- Maintain 1.20 m installation space in front of Battery flex
- Distance to adjacent equipment must not be less than 15 cm



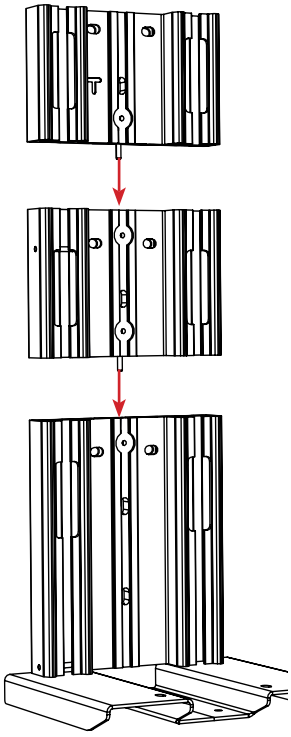
#01414 | Rev 12 | 21.07.2023

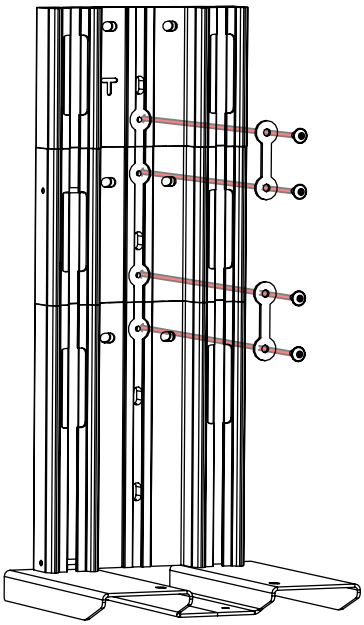
- Join wall bracket together (torque 6 Nm)



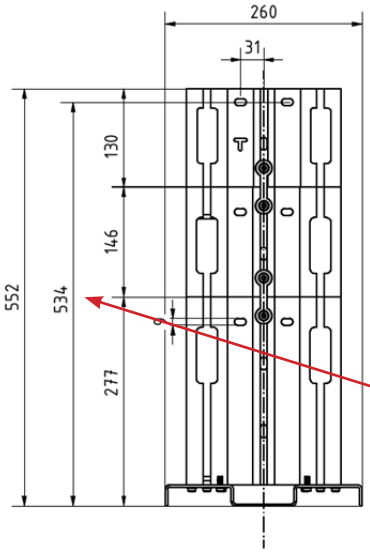
1 Connector

2 Pan head screw, M6x12 TX30



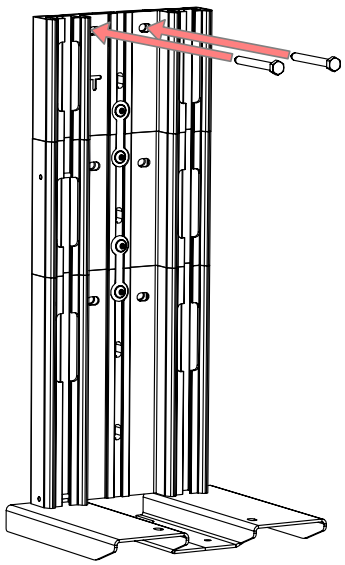


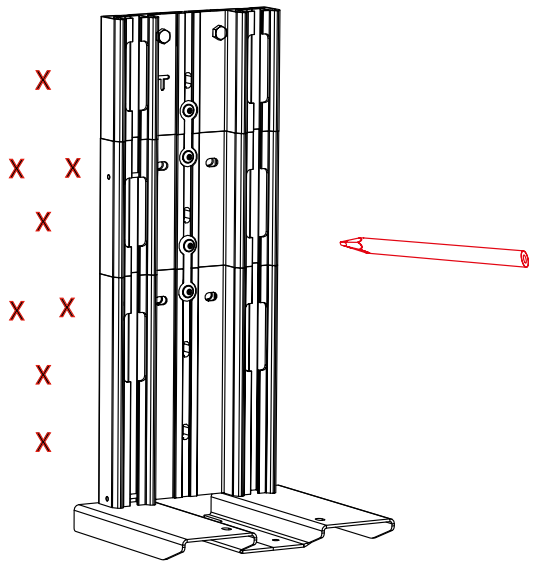
- Determine measuring point for top attachment (see table)
- Drill and insert anchors for top pack wall bracket



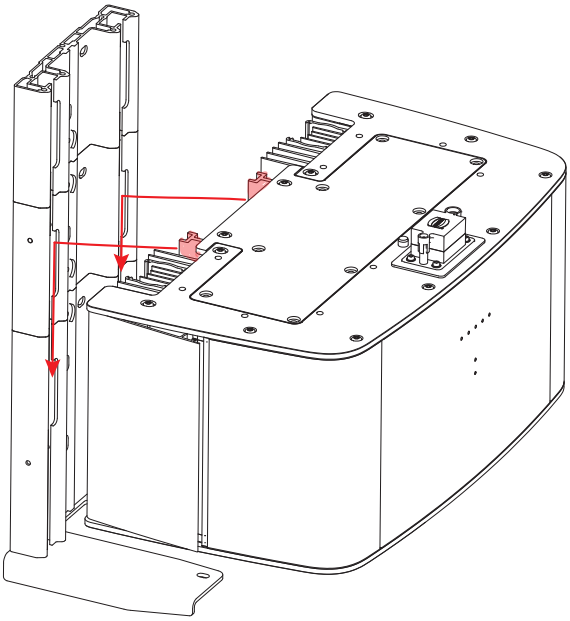
Gap between upper 2 drill holes in top pack wall bracket and lower edge on Base AC-1 wall bracket	
1411	Drill holes for pack 8
1265	Drill holes for pack 7
1119	Drill holes for pack 6
965	Drill holes for pack 5
827	Drill holes for pack 4
681	Drill holes for pack 3
534	Drill holes for pack 2

- Attach wall bracket and mark the remaining holes
- Drill remaining holes and insert dowels
- Mount the wall bracket on the wall with suitable screws (screws not included in delivery)

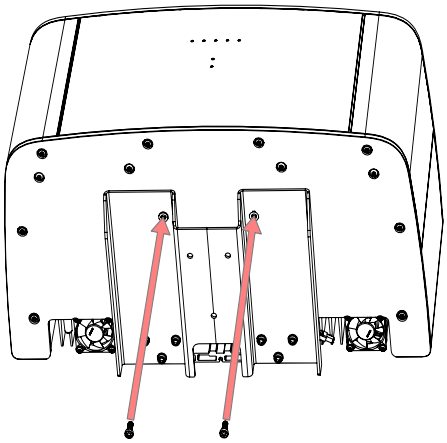




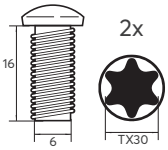
#01414 | Rev 12 | 21.07.2023

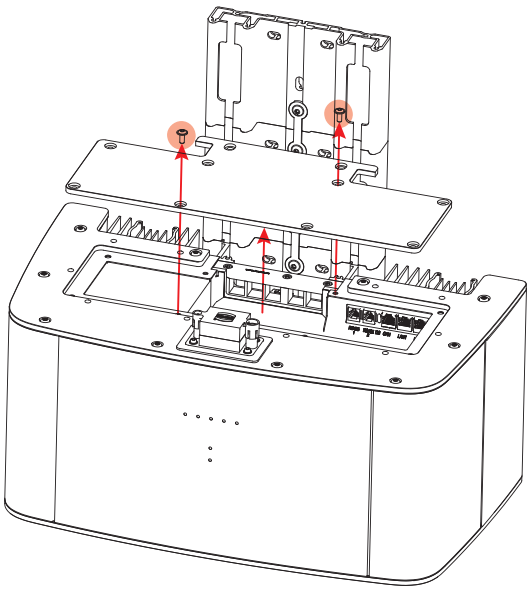


- Fit Battery flex base into the wall bracket



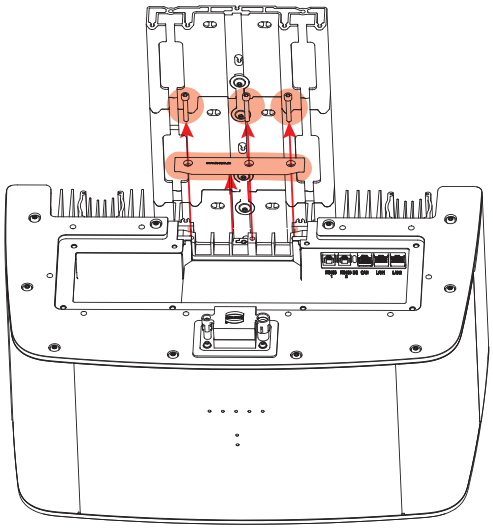
- Screw in the pan head screws (M6x16 TX30) on the Battery flex base's lower surface, but do not tighten them fully yet so that the modules can be tared for optimal gap dimensions between the modules



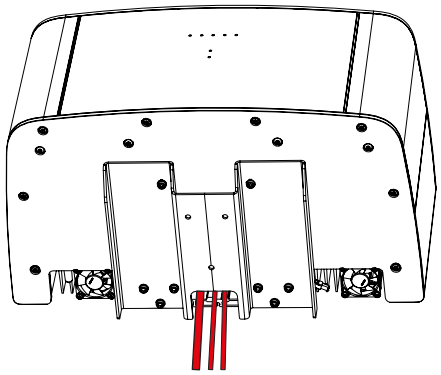


- Loosen the screws in the cover
- Remove the cover (access to the base's connection section)

#01414 | Rev 12 | 21.07.2023



- Loosen the screws on the cable bushing and pull out the cable bushing's upper cover



- Insert the connection cables on the lower surface between the rear wall of the base and the wall bracket

HAZARD

Life-threatening hazard

Only install cables when the device is switched off.

The grounding system will pose a life-threatening hazard if it is not connected according to regulations.

HAZARD

Charged capacitors pose an electrical hazard

A discharge time of 5 minutes must be observed after shutting off the Battery flex AC system before any work can be performed on the device.

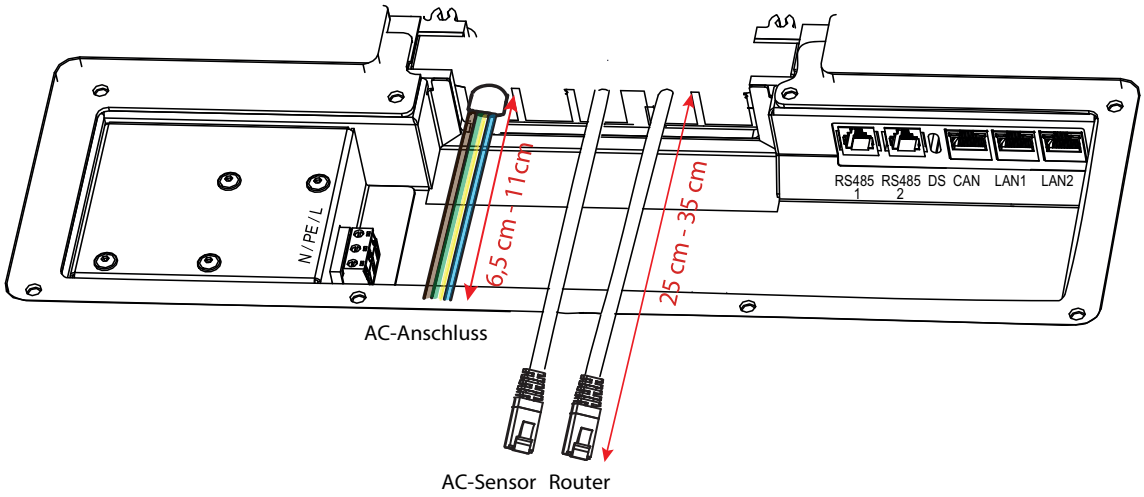
#01414 | Rev 12 | 21.07.2023

- Cut the 4 mm² or 6 mm² AC cable to length of min. 6.5 cm to max. 11 cm from the cable entry point and then strip the cable
- Cut the communication cable as a patch cable or installation cable (min. Cat5), CAN, LAN to length of min. 25 cm to max. 35 cm

5 Safety rules

Follow lock out steps:

- **Verify absence of voltage**
- **Lock out isolator(s)**
- **Disconnect**
- **Ground and short circuit as required**
- **Provide protection from adjacent live parts**



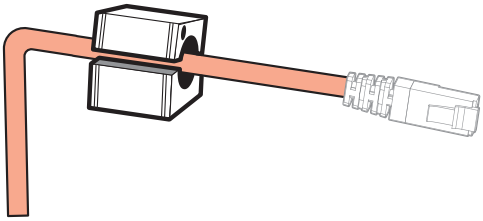
NOTE

The DIP switch (DS) must remain in the OFF position. Communication errors may otherwise occur.

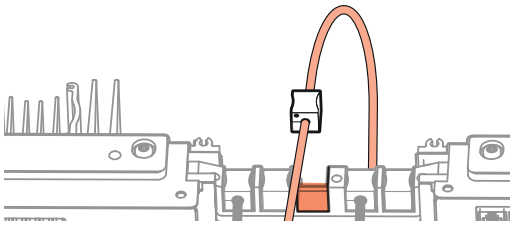
NOTE

Battery flex AC-11.3 has a fault current circuit breaker/RCD type B 30 mA integrated.

#01414 | Rev 12 | 21.07.2023



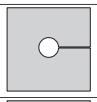
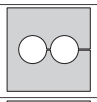
- Attach the cable grommets (included in delivery) to the cables



- Fix the cable grommets in the cable entry bracket

IMPORTANT

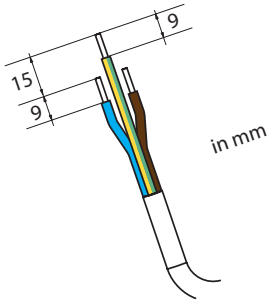
Cable diameters and cable grommets must be checked to ensure they are impervious and protected against mechanical strain. Damage
cannot be ruled out if there is no protection against mechanical strain in the cable installation. Moisture and dust must be safely prevented from entering through the cable feed-through if the system is installed outdoors.

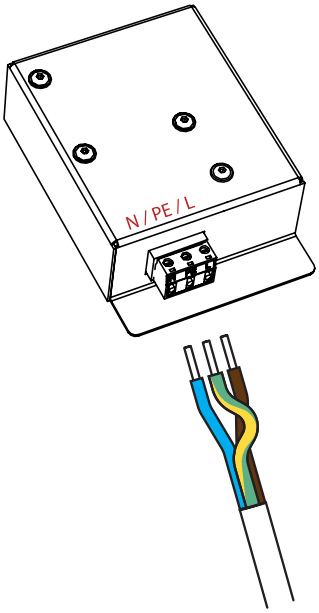
	Diameter	Name	Delivery scope [Unit]	Suitable for cable type
	9–10 mm	KT9 gy	1	AC cable
	11–12 mm	KT11 gy	1	AC cable
	15–16 mm	KT15 gy	1	AC cable
	5–6 mm	KT5 gy	3	CAN/Ethernet patch cable
	7–8 mm	KT7 gy	2	CAN/Ethernet/RS-485 installation cable
	2x 7-8 mm	KT2/7 gy	1	CAN/Ethernet/RS-485 installation cable
	Telephone line	KT Tele gy	2	RS-485 communication cable
	-	BTK gy	2	Dummy plug

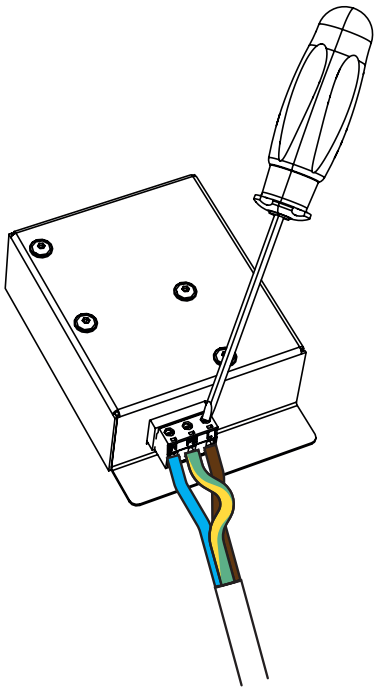
#01414 | Rev 12 | 21.07.2023

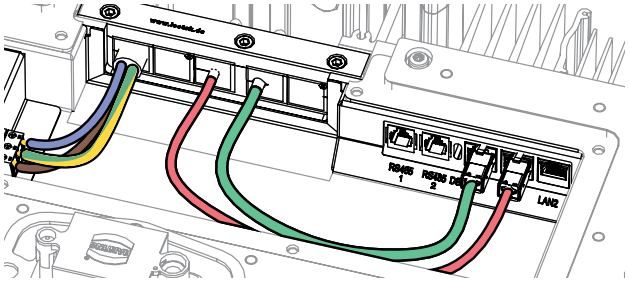
- Strip AC cable 3x 4 mm² or 3x 6 mm²
- Leave PE cable core longer (15 mm) than N and L (see figure) to safely ground the device even under tensile loads
- Skin cable cores to 9 mm

- Insert the AC cable N, PE, L cable cores into the green AC connection plug and fasten with a narrow slotted-head screwdriver
- Check tensile strength of cable cores

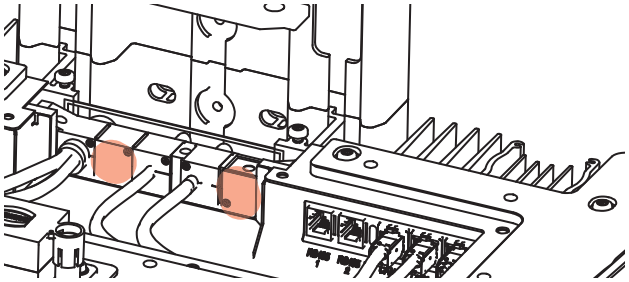






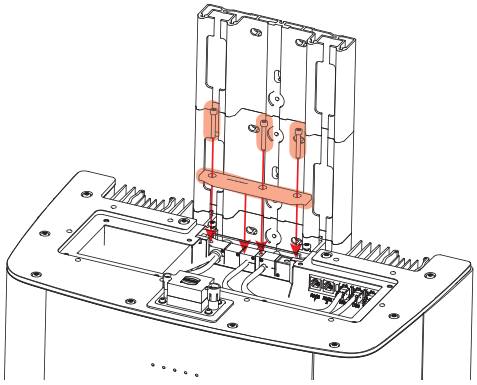


- Establish CAN (AC Sensor) and LAN (router) connection

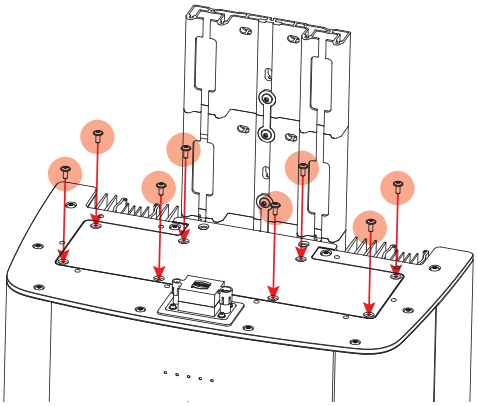


- Seal unused cable entries with dummy plugs

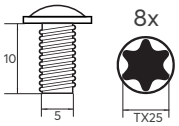
#01414 | Rev 12 | 21.07.2023

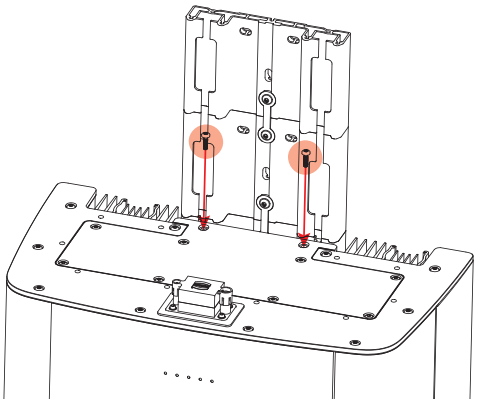


- Fit the cable bushing's cover (use 4 mm Allen key with a torque of 2.0-2.5 Nm)

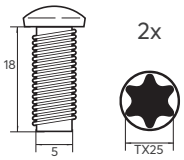


- Place the cover in position and fasten with 8 screws (pan head flat screw M5x10 TX30)
- Torque: 3 Nm





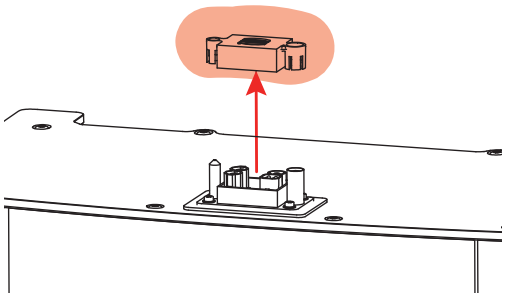
- Fasten cover with two additional self-tapping screws 50x18 TX25
- Torque: 6 Nm



IMPORTANT

Close the initial operation cover and cable bushing properly and check they are impermeable to prevent damage caused by weather conditions, especially when installing the system outdoors.

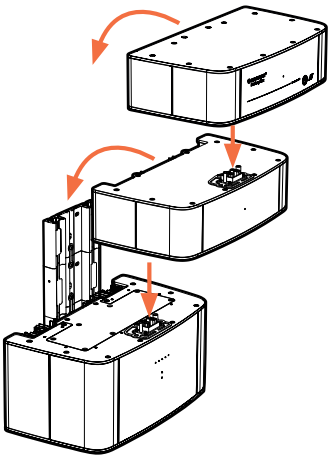
#01414 | Rev 12 | 21.07.2023



- Remove protective cap from Battery flex base AC-1 and Battery flex middle packs

NOTE

Protective caps must be kept ready for use at a later point in time. The protective cap must be fitted in place when Battery flex base and Battery flex middle pack are transported.



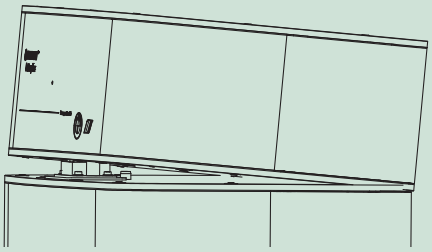
- Fit Battery flex middle and top pack

IMPORTANT

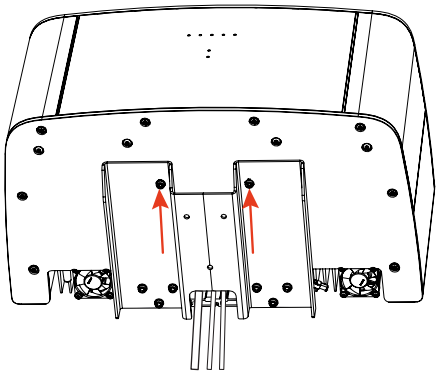
Ensure that there are no objects or any dirt such as dust between the Battery flex base and the Battery flex packs during installation. This may otherwise cause faults and problems with battery connection contacts.

NOTE

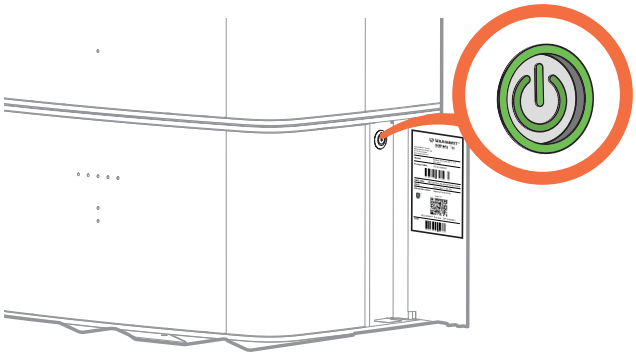
Ensure battery modules are straight when you fit them. Apply slight pressure by hand to straighten a crooked battery module.



#01414 | Rev 12 | 21.07.2023



- Finally tighten the Battery flex base attachment screws
- Torque: 3 Nm



- Switch on Battery flex base

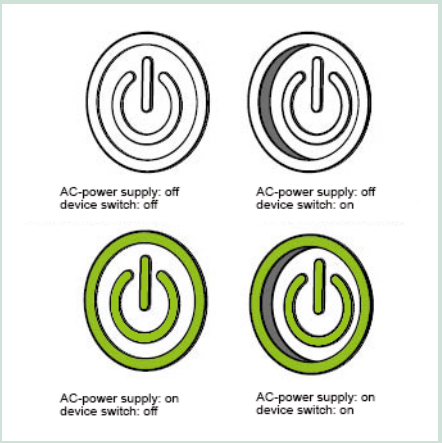
1. Switch on AC-side fuse; the ring of the device switch lights up green

2. Press device switch of the base; device switch pressed in

NOTE

Battery flex is switched on and off **via the device switch** on the Battery flex base (device switch **pressed in = on**).

The ring light on the device switch only indicates whether the AC-side fuse is on or off. To avoid a service case, always follow this sequence when switching the device on and off:



Switch on:
- Switch on AC-side fuse
- Press device switch of the base

Switch off:
- Press device switch of the base
- Switch off AC-side fuse

Not following this sequence can lead to a deep discharge of the Li-ion cell contained in the base, which is required for commissioning. You should avoid this **service case**.

#01414 | Rev 12 | 21.07.2023

Once Battery flex is switched on and connected to the Internet, an automatic software update will occur. The update may take **5 to 10 minutes**. During the update, the status LED initially lights up blue and starts flashing after approx. 40 seconds.

Do not abort the update process!

Status LED	
appr. 40 Sec. then flashing	Update in progress
Performance LEDs	
Running lights	Update in progress

If the update is interrupted or fails, the status LED does not start flashing or changes to a permanently white status even after several minutes.

Status LED	
Does not start flashing after several minutes or becomes permanently white	Update cancelled / failed

If the update process fails, proceed as follows:

- Switch off Battery flex base via the device switch
- Check network and internet connection
- Restart Battery flex basen

The status LED continues to light up white. After approx. 5 min at the latest, the update process starts again. The status LED initially lights up blue and starts to flash together with the performance LEDs after approx. 40 seconds.

If the update process is still not successful (status LED is not blue or green after successful update), establish the network and Internet connection at least briefly via cable to ensure the successful update.

The update was successful and Battery flex is ready for operation if the LEDs on the device appear as shown in the following figure.

Performance LEDs	
heartbeat: 3x double flashing, 3 sec. pause	Device has not yet been put into commission
Bluetooth LED	
flashes 1x	Waiting for Bluetooth connection with the Pro app

NOTE

If a Battery Flex Base needs to be turned off for **more than one week** after initial commissioning - for example, due to pending meter installation by the EVU - keep the base fully powered on but disconnect the CAN plug at the AC sensor. This way, the base will be supplied with power from the grid (standby mode), but neither charging nor discharging will occur.

If the Battery Flex Base still needs to remain **completely disconnected from the AC grid** for an extended period after the initial commissioning, it is only permissible for a **maximum total period of 6 months**. After installation, the Battery Flex Base AC-1 must initially remain powered on for **at least 24 hours**. After that, it can be turned off for **up to 2 months**. If a shutdown exceeding 2 months is necessary, a recharge of the internal backup cell of the base must be performed by keeping the Battery Flex Base AC-1 powered on for **at least 48 hours**. This procedure must be repeated after another 2 months if the shutdown continues.

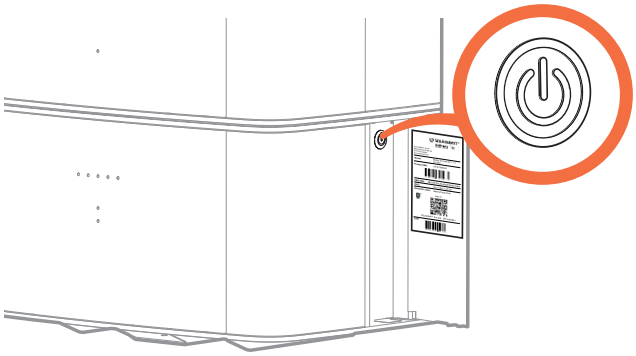
#01414 | Rev 12 | 21.07.2023

UPGRADE BATTERY FLEX PACK

NOTE

To ensure that the equalization of state of charges (SOCs) does not take too long, the SOC of the existing packs should be close to the SOC of the new packs (approximately 25% SOC). We recommend turning off the base using the device switch on the morning of the retrofit. This way, the packs will be discharged as much as possible and will be closest to the approximately 25% charge level of the new packs.

Also check the fuse protection of the power supply after the pack upgrade (see table in the chapter 'Required tools, resources, and installation materials').



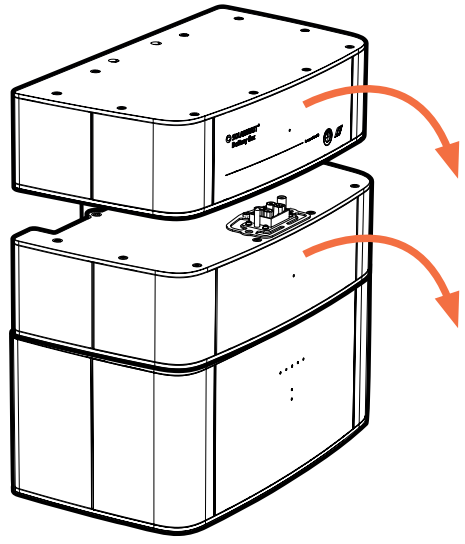
Switch off Battery flex base:

1. Switch off the device switch with ring illumination on the base (switch is no longer pressed in).

2. Switch off AC-side fuse (ring illumination is no longer green)

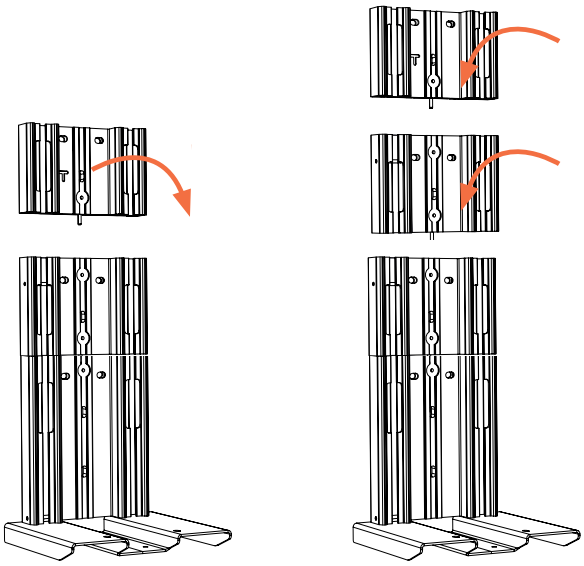
IMPORTANT

After switching off Battery flex base, wait until **no LED on the device is illuminated** before restarting Battery flex.

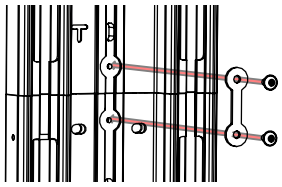


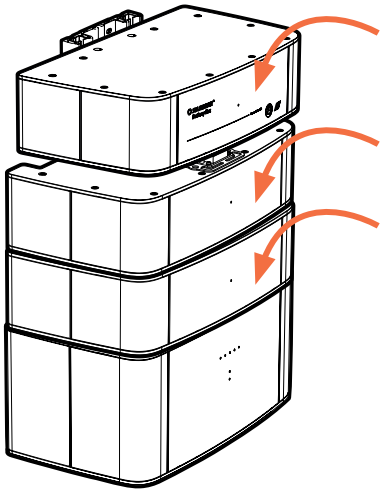
- remove top pack and upper middle pack

#01414 | Rev 12 | 21.07.2023

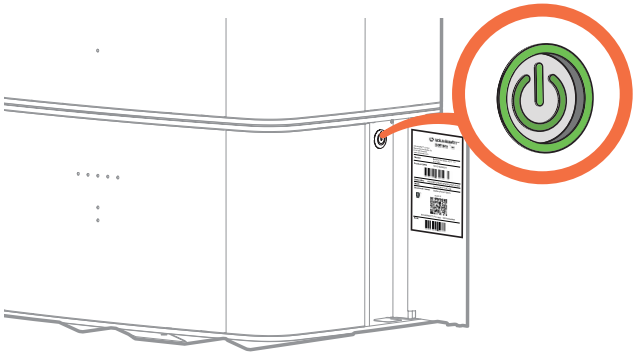


- disassemble top pack wall bracket
- assemble additional middle pack wall bracket
- reassemble top pack wall bracket
- connect wall holder





- remove middle packs and top pack



Switch on Battery flex base:

1. Switch on AC-side fuse; the ring light on the base device switch lights up green

2. Switch on device switch on base; device switch is pressed in

The additional Battery flex pack is automatically detected during reboot.

- Activate warranty for the new Battery flex pack!

#01414 | Rev 12 | 21.07.2023

Commissioning and charging strategy

IMPORTANT

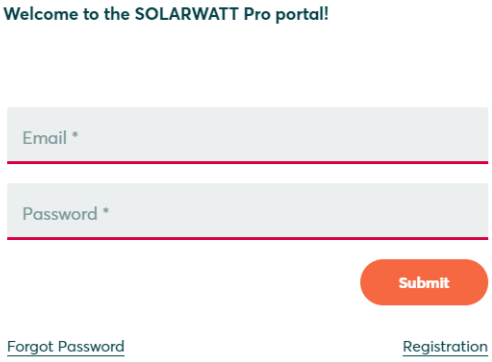
To ensure a successful initial installation, always use the SOLARWATT Pro app for commissioning.

Note that login to the app with your Pro Account credentials is only possible if you have attended the Battery flex certification training.

Before commissioning, ensure that you have SOLARWATT Pro portal access and that you can log into the Pro app with your access data!

SOLARWATT PRO ACCESS AND APP

- register for the SOLARWATT Pro portal at
- solarwatt.com Menu item Partner > Login



- download SOLARWATT Pro app herunterladen

Solarwatt.de/redirect-app-android-2021
Solarwatt.de/redirect-app-ios-2021

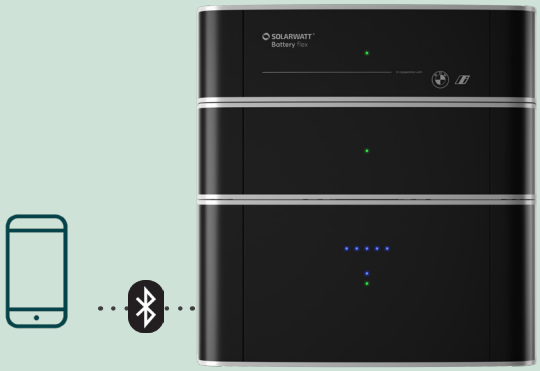
Available on the App Store

GET IT ON Google Play

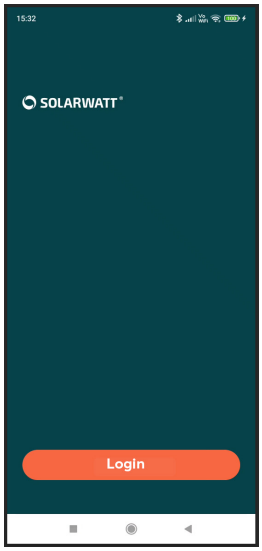
NOTE

Bluetooth communication
The best Bluetooth connection is on left side of the Battery flex base, as the Bluetooth module with the outlet to the antenna is located there.

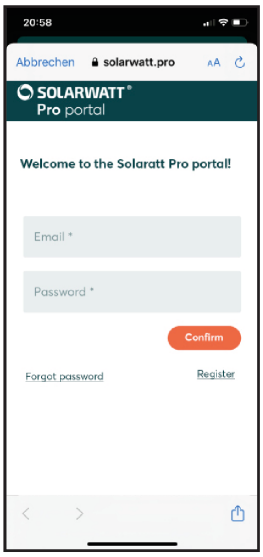
For a stable Bluetooth connection, position your cell phone or tablet at this point.



#01414 | Rev 12 | 21.07.2023



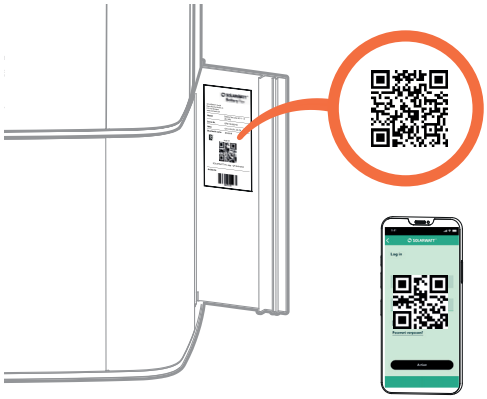
Start



Login PRO Account

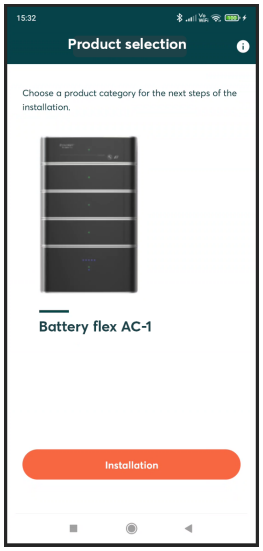
NOTE

If you have attended the Battery flex certification training but you are unable to log in to the app using your Pro account credentials, contact us by email at service@solarwatt.com. In the email, let us know the number of your training certificate so that we can unlock your account to use the Pro app.

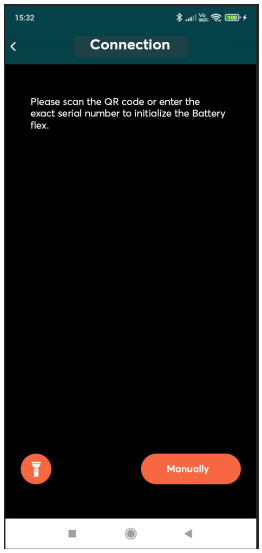


- Scan barcode with the pro app or connect device via manual input

#01414 | Rev 12 | 21.07.2023

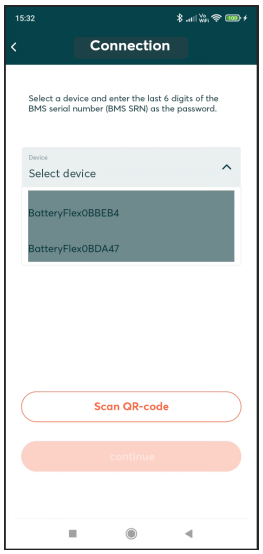


Select device

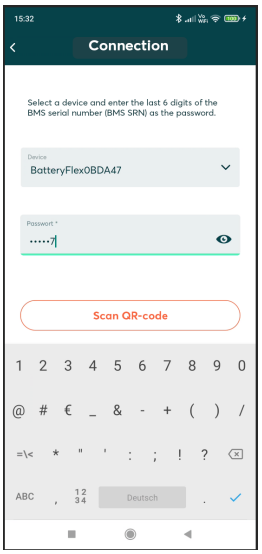


Choose connection type

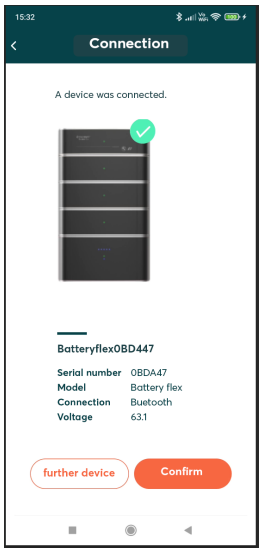
via manuel input:



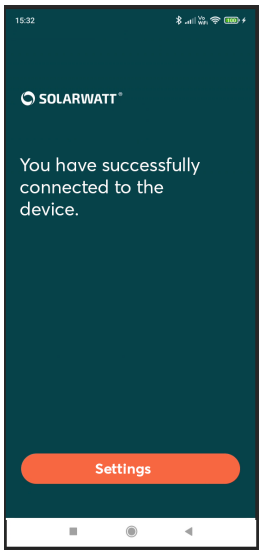
Select component

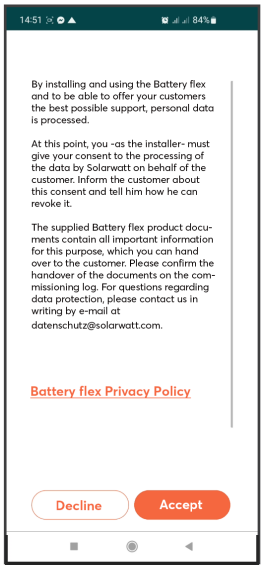


Enter password



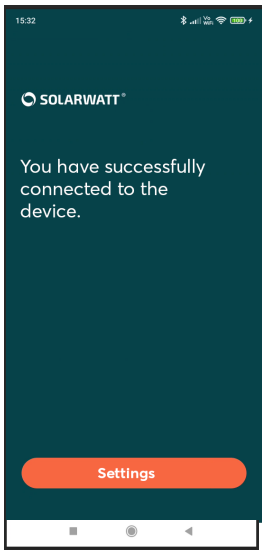
Connection established





Consent on behalf of the customer

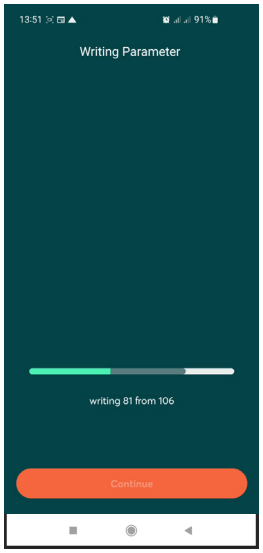
You can find all information about this consent under the following chapter *Important information about privacy*.



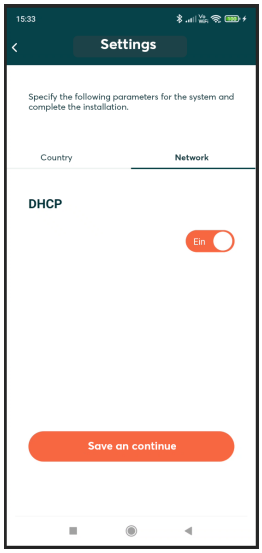
Start settings

Select country

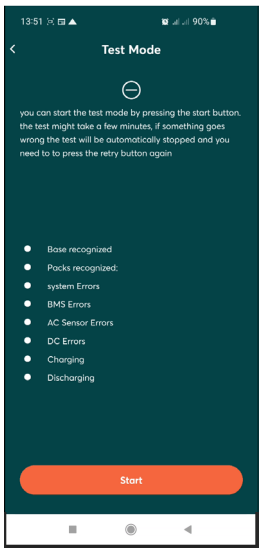
Confirm country selection



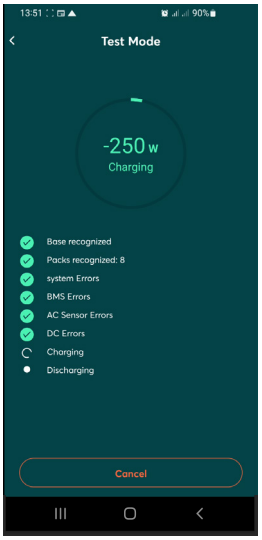
Transfer network parameters



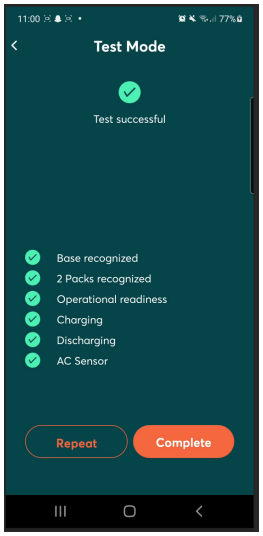
Network settings



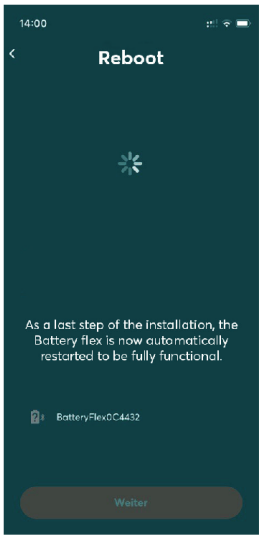
Start test mode



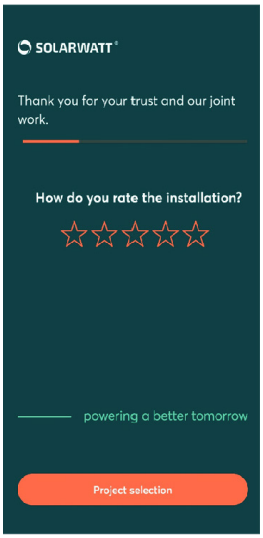
Test mode
(Status LED yellow)



Complete test mode



Reboot



#01414 | Rev 12 | 21.07.2023

NOTE

If a Battery Flex Base needs to be turned off for **more than one week** after initial commissioning - for example, due to pending meter installation by the EVU - keep the base fully powered on but disconnect the CAN plug at the AC sensor. This way, the base will be supplied with power from the grid (standby mode), but neither charging nor discharging will occur.

If the Battery Flex Base still needs to remain **completely disconnected from the AC grid** for an extended period after the initial commissioning, it is only permissible for a **maximum total period of 6 months**. After installation, the Battery Flex Base AC-1 must initially remain powered on for **at least 24 hours**. After that, it can be turned off for **up to 2 months**. If a shutdown exceeding 2 months is necessary, a recharge of the internal backup cell of the base must be performed by keeping the Battery Flex Base AC-1 powered on for **at least 48 hours**. This procedure must be repeated after another 2 months if the shutdown continues.

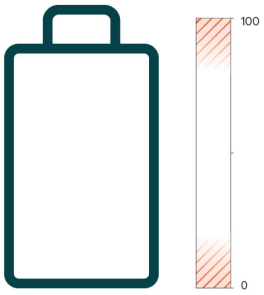
#01414 | Rev 12 | 21.07.2023

CHARGING AND DISCHARGING BEHAVIOR

Charging and discharging processes change the cell chemistry and thus the performance of the battery. To limit chemical stress as much as possible, Battery flex has software „fuses" that guarantee **gentle charging and discharging behavior.**
After **complete discharge (0 % SOC)**, the battery is first recharged to 15 to 20 % of its capacity before providing electricity again. During longer periods of low yield, the battery is thus protected against deep discharge.
After a **full charge (100 % SOC)**, the software ensures that the battery is not recharged until a state of charge of 75 to 80 % is reached. This protects the battery cells against accelerated cell aging.
Customers who notice this behavior and are not aware of the safety mechanisms may be unsettled. Why does the Battery flex not charge even though there is surplus solar power? Or: Why can't stored energy be used although the Battery flex is not yet empty?

- Explain the Battery flex charging and discharging behavior to your customers!

Lade- und Entlade-Strategie zur Optimierung der Zell-Lebensdauer

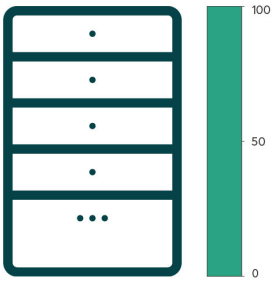


chemical stress

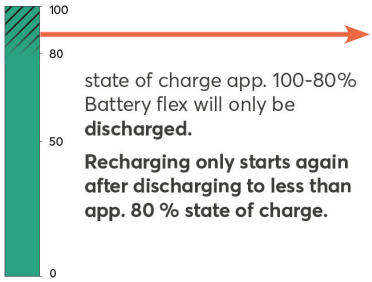
High states of charge or discharge cause chemical stress and thus a significantly accelerated aging process of the battery.

Battery flex follows the charging strategy described here to keep the chemical stress for the battery as low as possible.

Discharge behavior after full **charge** (state of charge 100 %):



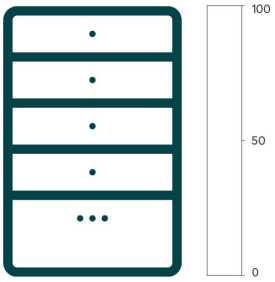
state of charge 100%
Battery flex is fully **charged**.



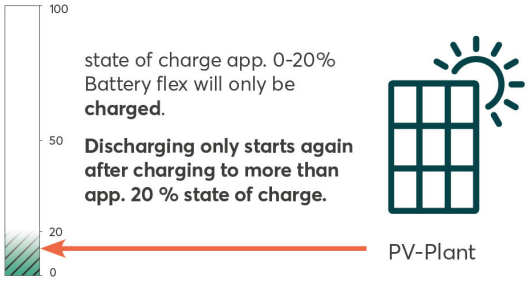
state of charge app. 100-80%
Battery flex will only be **discharged.**

Recharging only starts again after discharging to less than app. 80 % state of charge.

Charging behavior after complete discharge (state of charge 0 %):



state of charge 0%
Battery flex is fully **discharged**.



state of charge app. 0-20%
Battery flex will only be **charged**.

Discharging only starts again after charging to more than app. 20 % state of charge.

#01414 | Rev 12 | 21.07.2023

Service

IMPORTANT INFORMATION ON DATA PRIVACY

By installing and using the Battery flex and to be able to offer your customers the best possible support, **personal data** is processed.
You -as the installer- must consent to the processing of data by Solarwatt on behalf of the customer during installation with the Pro app.

- Inform the customer about this consent and tell them how they can revoke it.

For questions regarding privacy, please contact us in writing via email at datenschutz@solarwatt.com.

The supplied Battery flex **product documents** contain all the important information you can hand over to the customer.

- Confirm the handover of the documents on the **commissioning log**.

Customer information on data privacy

Explains the consent to the processing of personal data by the installer during commissioning and the possibility of revocation.

The consent is documented on the user interface of the Battery flex device by a set check mark.

According to Art. 7 (3) DSGVO, the customer has the right to object to this consent at any time by taking the following steps:

- go to http://batteryflex-X.local; instead of X, enter the last six characters of the Battery flex base serial number (located behind the right inner door of the device).

Alternatively:
Enter the IP address of the Battery flex (automatically assigned by the router) in the address bar of the browser.

- Take note of the conditions of the revocation
- Remove check mark
- Confirm by sending

Privacy policy

Explains what data is processed and what rights result for the customer from the storage of the data.

WARRANTY ACTIVATION/ACTIVATION OF FULL COVERAGE

To activate the Battery flex product warranty, use your login details as an installation company to enter the SOLARWATT Pro section at www.solarwatt.com. Please enter all required customer information for warranty activation in the customer management menu item.

#01414 | Rev 12 | 21.07.2023

Cleaning/care & maintenance

CLEANING

IMPORTANT

Damage to the nameplate on the Battery flex due to unsuitable cleaners being used.
Do not clean the Battery flex with alcohol or other chemical cleaners. Only use a damp rag with detergent or similar to clean the device.

MAINTENANCE WORK ON THE OVERALL SYSTEM

IMPORTANT

Personal injury and/or property damage as a result of maintenance by unqualified persons
Only qualified installers who are certified by Solarwatt may perform service and maintenance work on the Battery flex.

IMPORTANT

Personal injury from electric shock during improper testing of the overall system.
Battery modules must only be replaced by specialists who have received training in battery handling. Due care must be taken as required when carrying out this work.
Module batteries may only be replaced with identical battery modules by Solarwatt.
All general requirements regarding battery insertion and replacement apply.

#01414 | Rev 12 | 21.07.2023

Procedure in case of malfunction

Check the LED display. If a problem is indicated that requires service, contact Solarwatt Technical Support on +49 351 88 95 555.

Battery flex critical states
- Electrolyte leaking out
- Strong, pungent smell
- Smoke emission
- Storage battery is burning

Leave the installation site immediately. Notify the fire department

112

and then please contact our hotline on +49 351-8895-444.

FIREFIGHTING MEASURES

Alert the fire department and evacuate all persons from the immediate vicinity of the fire. There is a risk that burning or flammable particles will be flung from the source of the fire.

Unsuitable extinguishing agents: Water jets, Type D extinguishers
Suitable extinguishing agents: Sand, dry extinguishing powder, carbon dioxide, Type PM12i metal fire extinguishers

Instructions on fire extinguishing measure:
1. If the battery is exposed to fire but does not burn, water is suitable as an extinguishing agent and coolant.
2. If the battery has not overheated yet, the system may possibly be cooled with carbon dioxide or, alternatively, with a water jet if the following warning is heeded (see below) when the battery module is installed in the system.
3. Do not inhale vapors or use a self-contained breathing apparatus. Wear protective coveralls if possible.
4. The battery's heat value: approx. 14.88 MJ

HAZARD

If electrically conductive extinguishing agents are used or if exposed metal parts or cable cores come into direct contact, there may be a risk of electric shock. A DC voltage of up to 450 V and an AC voltage of up to the level of the mains voltage may be present at the system's connection point.

#01414 | Rev 12 | 21.07.2023

FIRST AID MEASURES

Inhalation
Remove affected persons from the exposure area and ensure they take in plenty of fresh air. Keep affected persons quiet and warm. Seek medical assistance in severe cases.
Swallowing
Thoroughly rinse mouth and surrounding area with water for at least 15 minutes. Seek medical assistance immediately.
Contact with skin
Thoroughly wash skin with tap water for at least 15 minutes. Remove contaminated clothing and wash thoroughly before reuse, or dispose of it. Seek medical assistance in severe cases.
Contact with eyes
Rinse thoroughly for at least 15 minutes. Keep eyelids open when doing so. Seek a physician.
Burns
Any burns caused must be treated appropriately. It is recommended to contact a physician.
Further treatment
A physician must be consulted for all cases of contamination in the eye, persistent skin irritation and for persons who have swallowed these substances or inhaled the vapors.

Packaging, transport, storage

PACKAGING AND TRANSPORT

IMPORTANT

New and non-defective, used battery modules may only be transported in the original SOLARWATT Battery flex packaging. This is certified hazardous goods packaging for the SOLARWATT Battery flex pack. Contact Solarwatt if you require packaging material. When shipping modules, also ensure that you label the packaging as hazardous goods transport and add the required ADR note.

IMPORTANT

The Battery flex components are delivered in separate packaging units. Please inspect the delivery for damage and completeness.
If damage is already recognizable on the packaging, please make a note of this on the delivery documentation and have the supplier (driver) sign it.
Reject heavily damaged packages.

HAZARD

Life-threatening danger due to installation of damaged components
Do not accept battery storage housings and battery modules in externally damaged packaging and never install them.
Contact Solarwatt immediately in such a case.

#01414 | Rev 12 | 21.07.2023

IMPORTANT INFORMATION FOR RETURNS

NOTE

You can find detailed instructions for the exchange as well as the packaging and return of Battery flex online in the SOLARWATT Pro area under Downloads, Battery flex and Documents for exchange and return.

The transport of lithium batteries is subject to the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). These regulations are based on the UN model regulations for the transport of dangerous goods.
The Battery flex pack must be transported according to the product's specific requirements as defined in UN Directive Number 3480. Packaging regulation P903 in particular must be observed during transportation. Persons without a hazardous materials endorsement on their driver's license may transport Battery flex packs provided that the total weight of the actual hazardous goods in the packaging units being transported does not exceed 333 kg (equal to 13 individual Battery flex pack units), .

Battery condition	Battery requirements		Packaging instruction	Labelling Package
New/used undamaged batteries	2.2.9.1.7		P 903	UN + no. 
Used battery	2.2.9.1.7	SV 377 No identifiable defect	P 909	UN + no. 
Damaged battery	2.2.9.1.7	SV 376 Danger during transport	Defined by competent authority (BAM)	UN + no. 
		SV 376 No danger during transport	P 908	

Source: Schwan, G. (2015). Lithium batteries in road traffic. Presentation at trade conference: Lithium batteries in logistics, Frankfurt am Main, p. 5.

New/used undamaged batteries:
New and undamaged used Battery flex pack battery modules may be transported further in their original packaging. To do so, compile a transport document according to ADR requirements for every instance of further transport and ensure that the required vehicle equipment is also carried (see enclosed table "Brief overview of transport with lithium-ion batteries").
The tests required to ensure transport safety were carried out for the Battery flex pack battery module in compliance with the applicable Directive UN38.3 and were passed.
The Battery flex pack battery modules are shipped in certified hazardous goods packaging in accordance with UN3480 hazardous goods classification.
Compile ADR transport document and carry along with modules
Carry along protective equipment for vehicle

Damaged batteries:
What are defective/damaged batteries according to Special Provision (SV) 376?
- Batteries leaking liquid or gas
- Batteries which can no longer be diagnosed prior to transport
- Batteries that have suffered cosmetic or mechanical damage
- Batteries with which safety-related defects have been identified

What has to be done if a defect or damage to the battery is detected?
Determine whether this will pose a danger during transport.

#01414 | Rev 12 | 21.07.2023

When does potential danger during transport arise?
A defect may cause batteries to:

- Break apart quickly
- Produce a dangerous reaction
- Form flames
- Produce dangerous levels of heat or emit vapors

What must you take into account while packing batteries if a damaged battery has been classified as non-dangerous?

- Label as "DAMAGED LITHIUM-ION BATTERIES"
- Use the certified original Battery flex pack packaging
- Batteries must be placed in packaging which is impermeable to liquid (plastic bag)
- Vermiculite insulation material (available from Solarwatt) must be packed between the battery and the original packaging

What do you need to do if it has been established that a damaged battery will produce a dangerous reaction during transport?
Contact the BAM (German Federal Institute for Materials Research and Testing)
Transport only in accordance with the conditions set out by the competent authority (BAM)!

Basic obligations upon freight transfer
The shipper must check whether the packaging is damaged when the packaged hazardous goods are handed over. They must make sure that a package is only loaded for transport if the packaging is sealed. The necessary hazard labels and other markings must be observed. They must also inform the vehicle driver of the hazardous goods.

The shipper and vehicle driver must observe the following regulations on loading and handling:

- Loading prohibited if there are defects (labelling, packaging and vehicle defects)
- Prohibitions of mixed loads and quantity limits per vehicle must be observed
- Separation rule for food, alcohol, tobacco and animal feed
- Securing of loads: the individual packages must be stowed and secured so that their position in relation to one another and in relation to the walls of the vehicle is only able to shift fractionally
- Smoking is prohibited during loading work

STORAGE

HAZARD

Conditions ranging from an adverse to a hazardous state due to improper storage of the battery modules and/or overall system

- Storage of the battery modules must take place under specific conditions.
- Do not store battery modules in ambient temperatures less than -20 °C and above 30 °C.
- Do not expose battery modules to direct sunlight.
- Do not store battery modules with highly flammable or corrosive substances.
- Do not throw battery modules into fire, do not open and/or dismantle them.
- Do not expose battery modules to air humidity above 85 % (non-condensing) and/or do not store them outdoors.
- Battery modules may be put into interim storage for a maximum of six months as of their date of shipping from the Solarwatt factory.

#01414 | Rev 12 | 21.07.2023

Disposal

You must not dispose of lithium-ion batteries in the general household waste. Solarwatt GmbH will take back used Battery flex pack batteries free of charge In accordance with the German Battery Act (BattG 2009). Contact our service hotline for this purpose: Tel. +49 351-8895-333.

You must not dispose of the product in the household waste. The applicable disposal regulations in the respective country must be observed.

Batteries can be returned to the point of sale free of charge. You must not dispose of the product in the household waste. The applicable disposal regulations in the respective country must be observed.

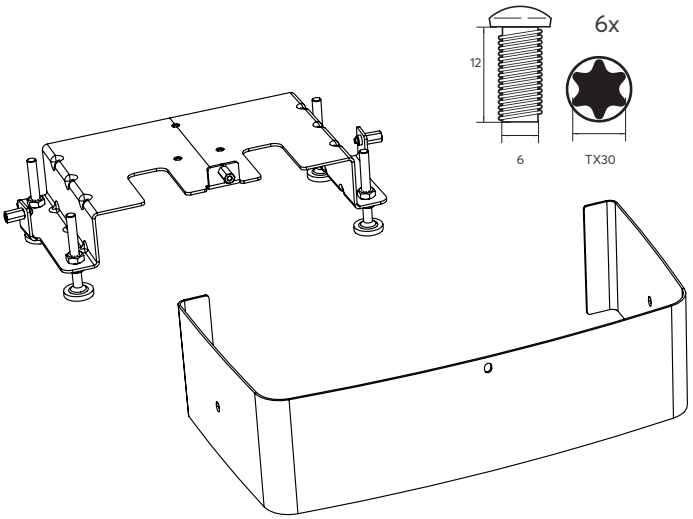
Outside Germany, please contact your local Solarwatt partner for information on disposal.

#01414 | Rev 12 | 21.07.2023

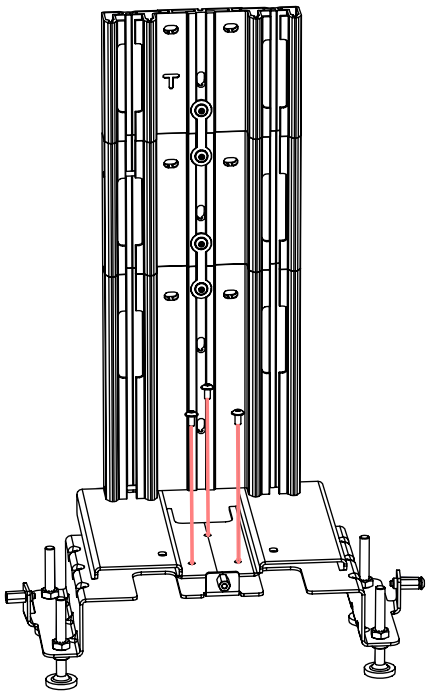
Appendix

BATTERY FLEX BASE STAND MOUNTING KIT 1.0 – OPTIONAL ACCESSORIES

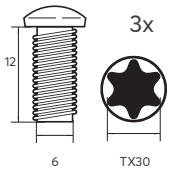
The Battery flex base stand mounting kit 1.0 is available as an optional accessory. The Battery flex base stand mounting kit 1.0 allows you to install the Battery flex AC storage system on the floor.



Included in delivery:
1x base
1 x cover plate
6x pan head screws, M6x12 TX30

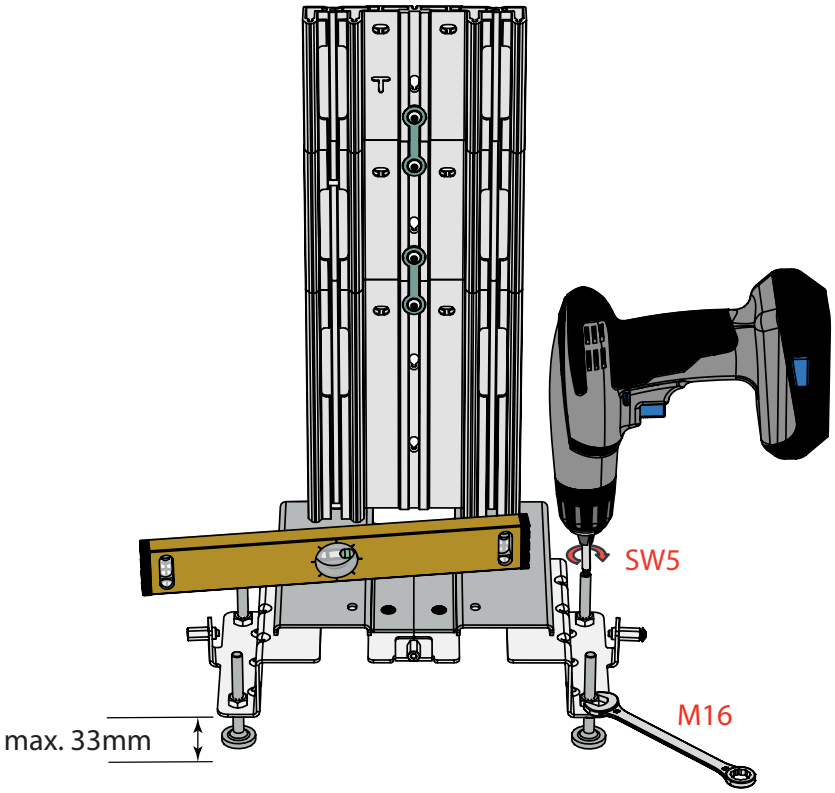


- Place the assembled Battery flex wall bracket on the base
- Also insert 3 pan head screws M6x12 TX30 to fit the Battery flex wall bracket to the Battery flex stand.
- Torque: 5 Nm



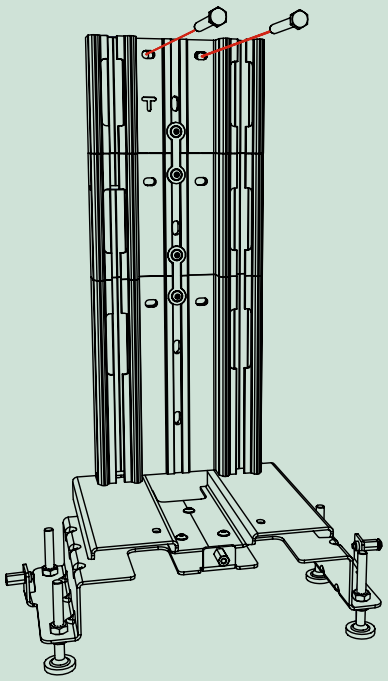
#01414 | Rev 12 | 21.07.2023

- Align the adjustable feet of the stand mounting kit horizontally
- The adjustable feet can be adjusted to a maximum of 33 mm
- Use an M16 spanner or an SW5 Allen key to adjust the height of the adjustable feet using the threaded nuts

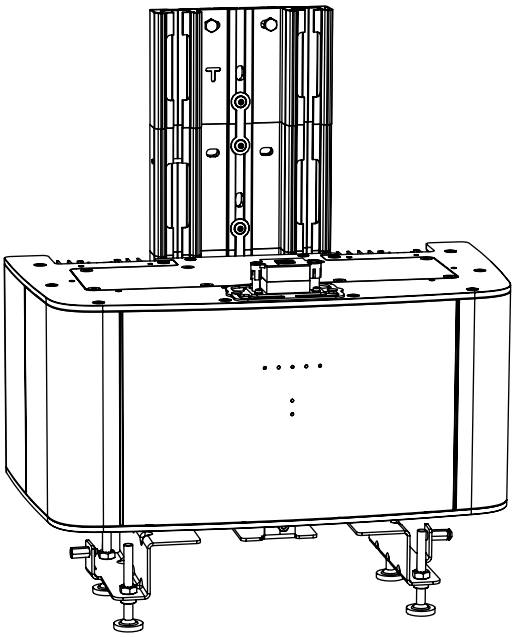


IMPORTANT

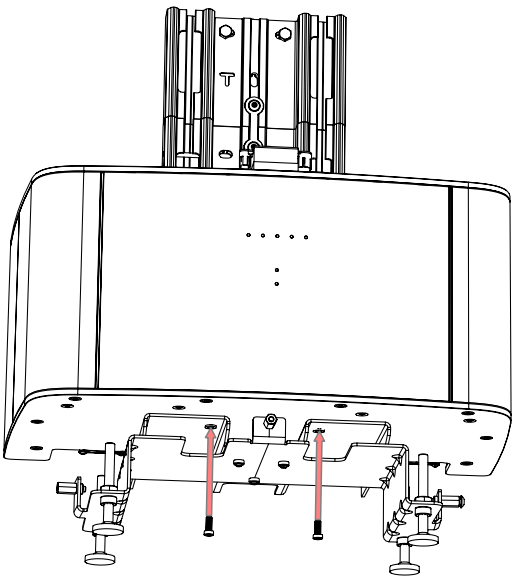
The Battery flex base stand mounting kit 1.0 must not be used for free-standing floor installation. The wall bracket must be fixed to the wall. Screws for fixing to the wall are not part of the delivery and must be provided by the installer.



#01414 | Rev 12 | 21.07.2023

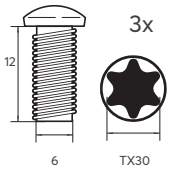


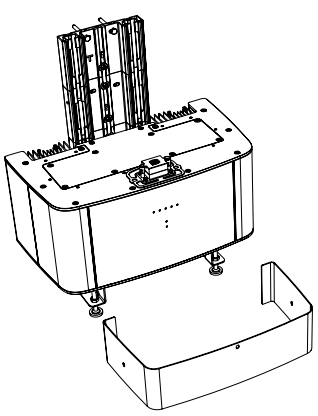
- Fit Battery flex base into the wall bracket

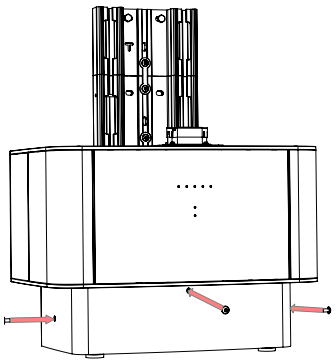


- Insert installation cable into Battery flex base

- Place the panel into position and fasten with screws
- Torque: 3 Nm
-







- Continue with next installation step: Battery flex base functional check

#01414 | Rev 12 | 21.07.2023

TECHNICAL PROBLEMS WITH AC SENSOR

Fault	Possible cause	Fault indication	Direct measurement fault correction	Transformer measurement fault correction
No measurement data	No power supply	No LED is lit	Check that voltage is applied to terminal L1	Check that voltage is applied to terminal L1
	CAN bus not connected/not connected correctly	CAN LED does not light up green	Check CAN bus connection and wiring	Check CAN bus connection and wiring
	Error	Status LED flashes 5x/sec.	Restart the ACS: • switch off the phase connected to L1 • switch on again after 3 s	Restart the ACS: • switch off the phase connected to L1 • switch on again after 3 s
Implausible Measurement data	Incorrect installation	Feed-In LED indicates incorrect state	Check assignment of L1, L2 and L3 Check mains (grid) and building sides	Check assignment of L1, L2 and L3 to their corresponding converters
	Two or more phase conductors interchanged	Feed-In LED indicates incorrect state	Check assignment of L1, L2 and L3	Check assignment of L1, L2 and L3 to their corresponding converters Check flow direction of current transformers
	Secondary lines from one or more transducers connected incorrectly	Feed-In LED indicates incorrect state		Check direction of current in current transformers and connection of secondary lines

If you are experiencing other technical problems with the AC Sensor, please contact the Service hotline. We will need the following information to assist you further:

- ACS model and serial number (see nameplate)
- Type and serial number of the device receiving the measurements form the ACS on the CAN bus
- Provide as much detail as possible when describing the fault

#01414 | Rev 12 | 21.07.2023

OVERVIEW OF LED DISPLAY

Battery LED	SOLARWATT Battery flex pack		
	self test after commissioning	update	normal operation and errors
	successfully detected (Battery LED lights up green briefly when connected to base/packs)		operational
flashlight		update	
		system restarts	
			service required
	not connected		

Performance LEDs	SOLARWATT Battery base AC-1		
heartbeat: 3x double flashing, 3 sec. pause	Device has not yet been put into operation.		
	self test after commissioning	update	normal operation and errors
	internet connection		
	data connection AC-Sensor		
	data connection via RS-485		
	error battery		
	error AC part		
			state of charge 0 - 20 %
			state of charge 21 - 40 %
			state of charge 41 - 60 %
			state of charge 61 - 80 %
			state of charge 81 - 100 %
sequential light		update	charging
sequential light			discharging
simultaneously pulsating			IDLE mode / power saving mode Number of pulsating LEDs = state of charge

Bluetooth LED	SOLARWATT Battery base AC-1		
flashes 1x	Device is waiting for Bluetooth connection with the Pro app.		
	self test after commissioning	update	normal operation and errors
double flash	transmission mode	transmission mode	transmission mode

Status LED	SOLARWATT Battery base AC-1		
	self test after commissioning	update	normal operation and errors
flashlight	self test running (min. 10 sec.)		no connection to the AC-Sensor
	self test completed without errors		operational
flashlight		update	
		update failed	
		system restarts	
			test mode during commissioning with the app
flashlight			error, manual restart required
flashlight			service required
	self test completed with errors		

#01414 | Rev 12 | 21.07.2023

Do you have any questions? Please feel free to contact us.

We would like to make it as easy as possible for you to form an active part of the energy transition. Whether you'd like to ask very specific questions or simply arrange a consultation without obligation, we'll be happy to hear from you at any time and look forward to your call or e-mail.

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