SOLAR INVERTERS

Quick Installation Guide
REACT 2
## 3.6 to 5.0 kW

Index

1. Reference number index

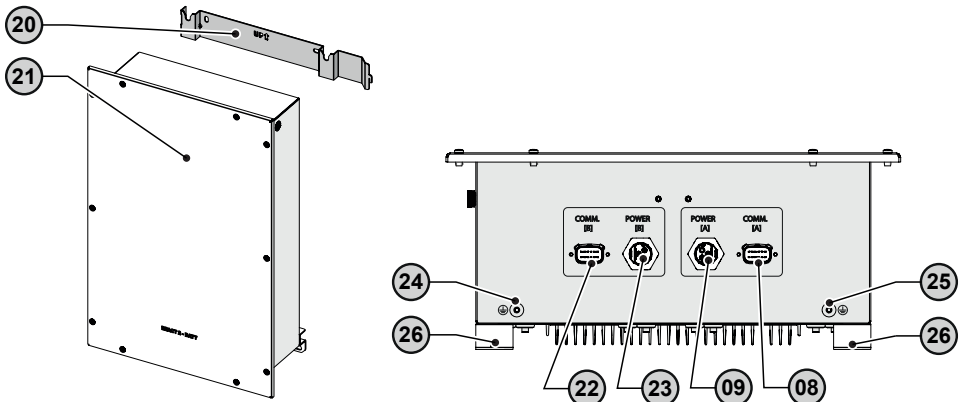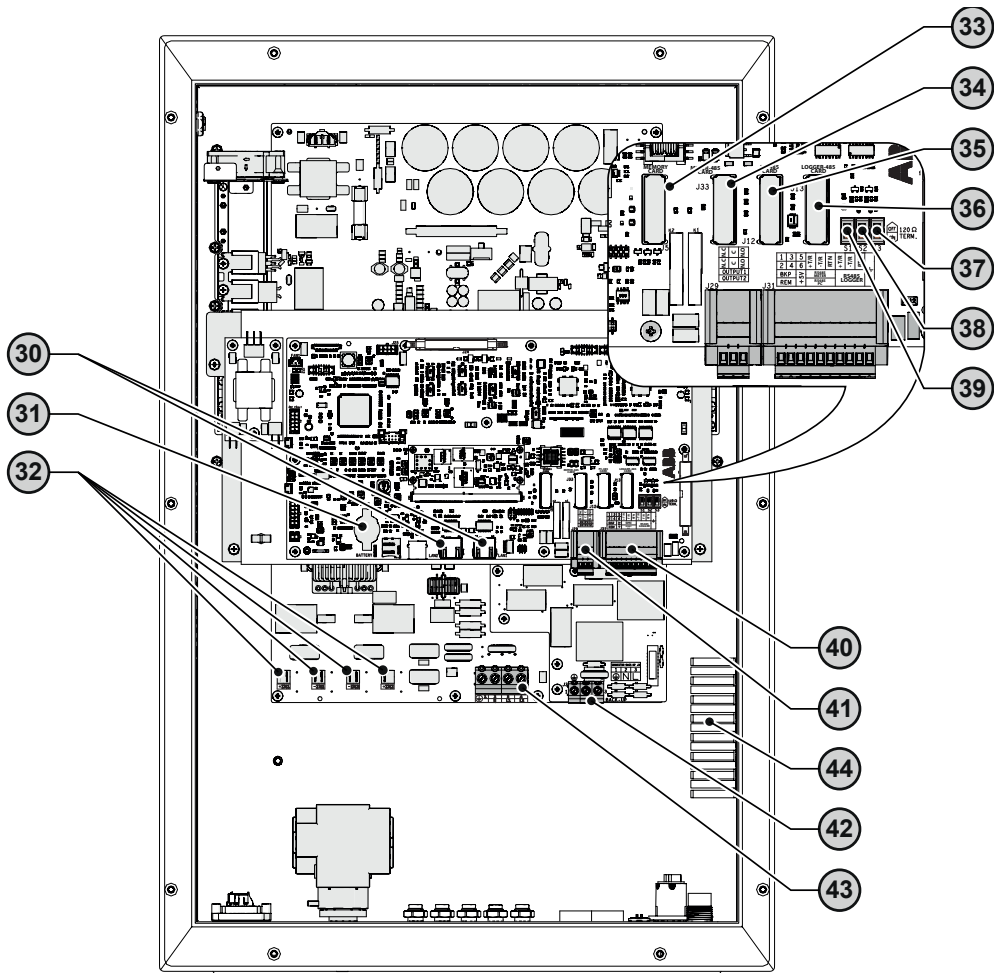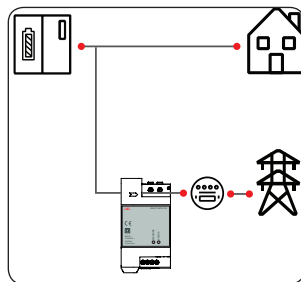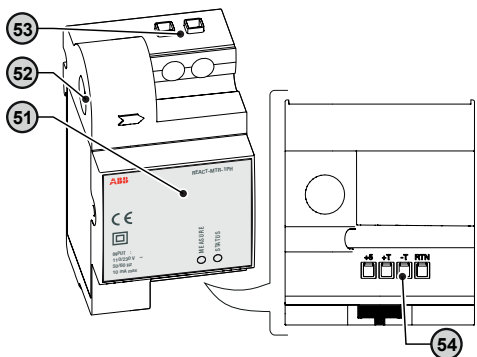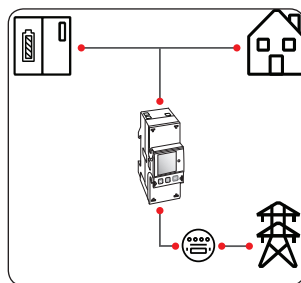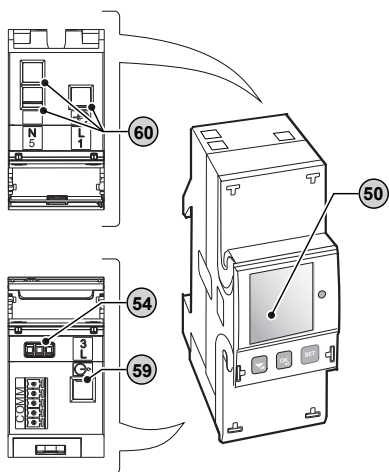|					
01	REACT2-UNO wall bracket	20	REACT2-BATT wall bracket	40	Communication and control signal screw terminal block
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17	AC output (GRID) connector	39	RS485-METER line termination switch		

REACT2-UNO-3.6/5.0-TL (external view)
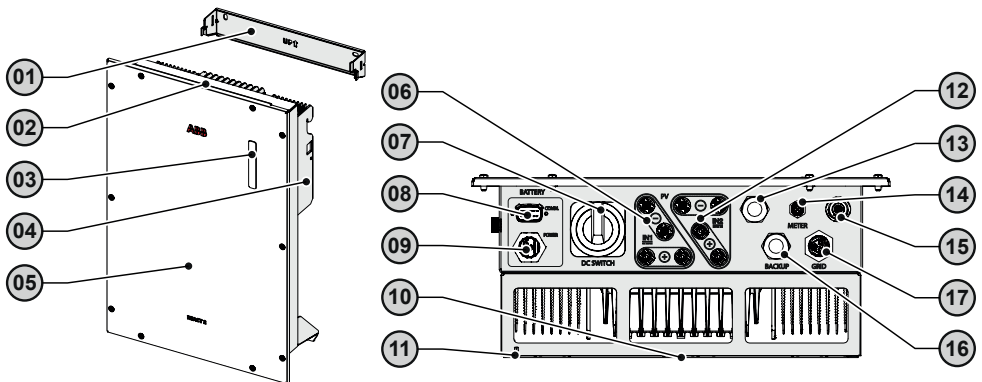
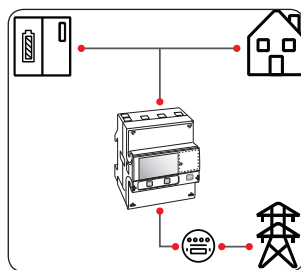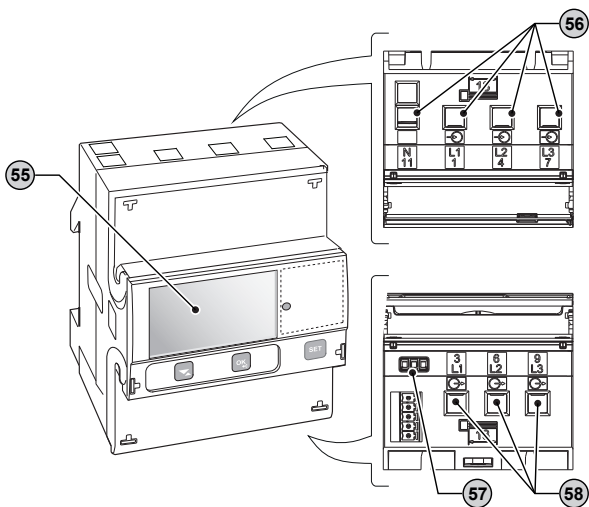## REACT2-BATT (external view)

REACT2-UNO-3.6/5.0-TL (internal view)

REACT-MTR-1PH

Meter ABB B21

Meter ABB B23, B24

2. Labels and Symbols

The labels on the inverter and on battery unit have the Agency marking, main technical data and identification of the equipment and manufacturer

ABB
www.abb.com/solar
SOLAR INVERTER
MODEL: REACT2-UNO-3.6-TL **a**
Made in Italy
PROTECTIVE CLASS: I

$V_{dc\ max}$	575 V
V_{dc} Operating Range	90 – 575 V
V_{dc} MPP	160 – 480 V
$I_{dc\ max}$	2 x 12 A
$I_{sc\ max}$	2 x 15 A

V_{acr}	230 V 1Ø
f_r	50 Hz
P_{acr} (cosφ = 1) / $P_{ac\ max}$	3600 W
P_{acr} (cosφ = ±0.9)	3200 W
S_{max}	3600 VA
Adj. cosφ	0.1 –1[in]
$I_{ac\ max}$	16 A

(1): Over/Under excited

BATTERY PORT
V_{dc} Operating Range	170 – 575 V
$I_{dc\ max}$ (charge)	13.5 A
$I_{dc\ max}$ (discharge)	10 A

BACKUP OUTPUT
V_{acr}	230 V 1Ø
f_r	50 Hz
$I_{ac\ max}$	13 A
S_{acr}	3000 VA

PROTECTIVE EARTHING REQUIRED
-20 to + 55 °C / -4 to +131 °F   IP65   5 minutes

ABB
www.abb.com/solar
SOLAR INVERTER
MODEL: REACT2-UNO-5.0-TL **a**
Made in Italy
PROTECTIVE CLASS: I

$V_{dc\ max}$	575 V
V_{dc} Operating Range	90 – 575 V
V_{dc} MPP	195 – 480 V
$I_{dc\ max}$	2 x 13.5 A
$I_{sc\ max}$	2 x 15 A

V_{acr}	230 V 1Ø
f_r	50 Hz
P_{acr} (cosφ = 1) / $P_{ac\ max}$	5000 W
P_{acr} (cosφ = ±0.9)	4500 W
S_{max}	5000 VA
Adj. cosφ	0.1 –1[in]
$I_{ac\ max}$	22 A

(1): Over/Under excited

BATTERY PORT
V_{dc} Operating Range	170 – 575 V
$I_{dc\ max}$ (charge)	13.5 A
$I_{dc\ max}$ (discharge)	14 A

BACKUP OUTPUT
V_{acr}	230 V 1Ø
f_r	50 Hz
$I_{ac\ max}$	13 A
S_{acr}	3000 VA

PROTECTIVE EARTHING REQUIRED
-20 to + 55 °C / -4 to +131 °F   IP65   5 minutes

ABB
www.abb.com/solar
BATTERY UNIT
MODEL: REACT2-BATT **a**
Made in Italy
PROTECTIVE CLASS: I

$V_{dc\ max}$	575 V
V_{dc} operating range	170 - 575 V
$I_{dc\ max}$ (charge)	4.5 A
$I_{dc\ max}$ (discharge)	5.6 A
Whr	4.0 kWh

-20 to +55 °C (*) / -4 to +131 °F (*)   IP54

(*): Out of 0 to +40 °C (+32 to +104 °F) temperature range, power derating occurs

Contains Rechargeable Li-ion Battery

WARNING!
- Refer to instruction manual for proper installation.
- Do not remove the cover. No user serviceable parts inside.
- Do not expose the unit to heating sources.
- Do not expose the unit to direct solar irradiation.
- Do not install or operate the unit in potentially explosive atmospheres.

MODEL NAME **a**

b P/N:PPPPPPPPPP

WO:XXXXXXX

SO:SXXXXXXXX Q1

c SN:YYWWSSSSSS WK:WₐYY **d**

POWER-ONE ITALY S.p.A
Via S.Giorgio 642, Terranuova Bracciolini (AR), 52028, Italia

SN WLAN: SSSSSSSSSS **f**
PN WLAN: PPP.PPPPP.PP **g**
MAC: XX:XX:XX:XX:XX:XX **h**

Remove and apply on the Quick installation guide   1.
SN Inverter: SSSSSSSSSS
MAC: XX:XX:XX:XX:XX:XX
PK: KKKK-KKKK-KKKK-KKKK **i**

a	Inverter/battery model
b	Inverter/battery Part Number
c	Inverter/battery Serial Number
d	Week/Year of manufacture
e	Main technical data
f	WLAN embedded board Serial Number
g	WLAN embedded board Part Number
h	MAC address
i	Product Key

The labels attached to the equipment must NOT be removed, damaged, dirtied, hidden,etc...
If the Admin Plus password is requested, the field to be used is the serial number -SN: YYWWSSSSSS-

In the manual and/or in some cases on the equipment, the danger or hazard zones are indicated with signs, labels, symbols or icons.

📖	Always refer to instruction manual	⚠	General warning - Important safety information	⚡	Hazardous voltage
IP65	Protection rating of equipment	🌡°	Temperature range	⊗	Without isolation transformer
+ −	Positive pole and negative pole of the input voltage (DC)	🧤	Always use safety clothing and/or personal safety devices	⏚	Point of connection for grounding protection
≅	Direct and alternating currents, respectively	≋	Hot surfaces	⚡	Time need to discharge stored energy

3. Lifting and transport

Transport and handling
Transportation of the equipment, especially by road, must be carried out using appropriate vehicles and methods to protect the components (particularly electronic components) from violent shocks, humidity, vibration, etc.
Note for REACT2-BATT: the road transport is regulated by the ADR international agreement.

Lifting
ABB usually stores and protects individual components by suitable means to make their transport and subsequent handling easier. No-netheless, as a rule, it is necessary to turn to the experience of specialised staff to take charge of loading and unloading components. Where indicated and/or available, eyebolts or handles, which can be used as anchorage points, are inserted and/or can be inserted. The means used for lifting must be suitable to bear the weight of the equipment.

Equipment weight

Device	Weight (kg)	Lifting points
REACT2-UNO-3.6/5.0-TL	< 22 kg	4 (suggested in case of 2 operators)
REACT2-BATT	50 kg	4 (suggested in case of 2 operators)

⚠ **The number of required operators necessary to lift the equipment must be in accordance to local regulations relating lifting limits per operator**

Unpacking and checking
The components of the packaging must be disposed on in accordance with the regulations in force in the country of installation. When you open the package, check that the equipment is undamaged and make sure all the components are present. If you find any defects or damage, stop unpacking and consult the carrier, and also promptly inform the Service ABB.
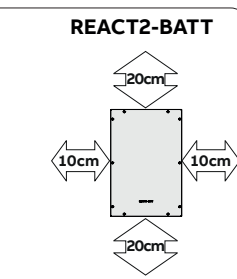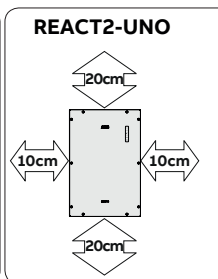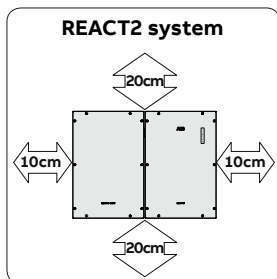
4. List of supplied components

Available components for REACT2-UNO	Quantity
Bracket for REACT2-UNO wall mounting	1
Connector for connection of the multifunctionale relay	2
Connector for connecting the communication and control signals	1
M5 hex nuts , M5 flat washer and M5 serrated lock washers for protective earth cable installation	1+1+1
Jumpers for configuration of the parallel input channels	1 (red) + 1 (black)
EMI filter for AC output (BACKUP) cable gland (16)	1
Wi-Fi antenna	1
AC output (GRID) connector (17) counterpart	1
METER connector (14) counterpart	1
Technical documentation	1

Available components for REACT2-BATT	Quantity
Bracket for REACT2-BATT wall mounting	1
REACT2-BATT power connection cable	1
REACT2-BATT signal connection cable	1
Cable lug for earth cable	2
M5 hex nuts , M5 flat washer and M5 serrated lock washers for protective earth cable installation	1+1+1
Technical documentation	1

5. Choice of installation location

Environmental checks
- See characteristics and technical data paragraph to check the required environmental conditions (protection rating, temperature, humidity, altitude, etc.)
- The installation location shall be easily accessible
- The inverter operates normally up to 2000 meters; Above 2000 meters the inverter works in derating.
- Never open the REACT2-UNO in the case of rain, snow or a level of humidity >95%.
- Prevent access to the installation location by children
- Installation of the unit in a location exposed to solar rays makes the warranty void as it may cause:
  - power limitation phenomena in the inverter and in the battery unit
  - premature wear of the electrical/electromechanical components
  - premature wear of the mechanical components (gaskets) and of the user interface (synoptic)
  - reduction in performance, lifetime and possible damage of the battery unit
- Do not install in small closed rooms where air cannot circulate freely
- Always ensure that the flow of air around the inverter is not blocked so as to prevent overheating.
- Do not install in locations where flammable substances or gases may be present
- Do not install on wooden walls or near flammable substances.
- Do not install in locations with a constant presence of water and/or high humidity level.
- Respect the minimum distances from objects around the REACT2-UNO and REACT2-BATT that could prevent the inverter installation and restrict or block the air flow.
- The installation must take account of any electrical devices (e.g. lamps, switches, etc.) which must be at least 20cm from the equipment. These distances must be maintained also to facilitate the circulation of the air needed to cool the unit and to facilitate the operations to install/maintain hardware and software which is done by dismantling the covers placed on the front.
- Install vertically with a maximum inclination of 5° (forward or backward).
- For a multiple installation, position the inverters side by side. If the space available does not allow this arrangement, position the inverters in a staggered arrangement (as shown in the figure) so that heat dissipation is not affected by other inverters:
  - Two or more REACT2-BATT can be installed one above the other.
  - Do not install the REACT2-BATT above the REACT2-UNO.
- The REACT2-UNO and REACT2-BATT can be installed separately and at greater distances using the "REACT2-XL-CABLE-KIT" cable kit (2 meter cables length).


REACT2 system
20cm / 10cm / 10cm / 20cm

REACT2-UNO
20cm / 10cm / 10cm / 20cm

REACT2-BATT
20cm / 10cm / 10cm / 20cm
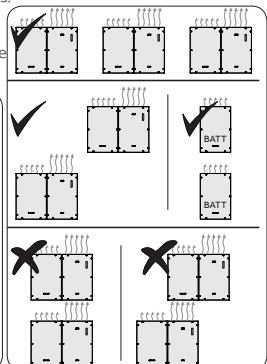
5. Choice of installation location (continuation)

- Do not install in rooms where people live or where the prolonged presence of people or animals is expected, because of the noise that the system produces during operation The level of the sound emission is heavily influenced by where the appliance is installed (for example: the type of surface around the inverter, the general properties of the room, etc.) and the quality of the electricity supply.
- Avoid electromagnetic interference that can compromise the correct operation of electronic equipment, with the consequent hazards
- The ambient temperature of the installation location should be between 5°C and 30°C to guarantee the optimal operation of the battery unit (REACT2-BATT). Here below are the functions available from the system on the basis of the ambient temperature:
  T1 - Optimal operation of the REACT2 system
  T2 - Correct operation of the REACT2 system with possible reduction of power
  T3 - Operation limited to the inverter part only. Management of the battery is disabled.
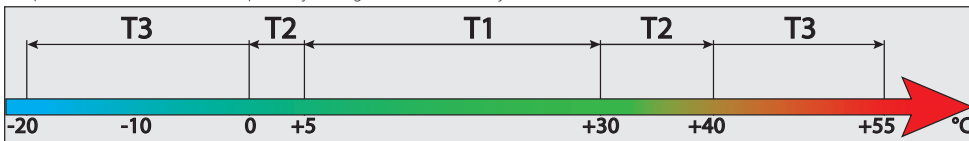
- Hardware and software maintenance on REACT2-UNO entails opening the front cover. Check that the correct installation safety distances are observed in order to allow routine check and maintenance operations.
- Install on a wall or strong structure suitable to bear the weight.
- Install at a height which takes into consideration the weight of the appliance and in a position which is suitable for servicing, unless suitable means are provided to carry out the operation.
- If possible, install at eye-level so that the synoptic can be seen easily.
- The inverter can be commissioned and monitored using the wireless communication channel. The WLAN uses radio waves to transmit and receive data, it is therefore important to find a position for the router considering the different materials which the radio signal will have to pass through:

Material	Relative signal reduction
Open field	0% (strength of approximately 40 meters)
Wood / Glass	From 0 to 10%
Stone / Plywood	From 10 to 40%
Reinforced concrete	From 60 to 90%
Metal	Up to 100 %

⚠ **Final installation of the inverter must not compromise access to any externally located disconnection devices.**

6. Mounting Instructions

Wall installation of the REACT2 system

- Position the REACT2-UNO bracket (01) so that it is perfectly level on the wall and use it as a drilling template.

- It is the installer's responsibility to choose an appropriate type of screw anchors for the attachment points. The choice must be based on the type of support (wall, frame or other support), the type of anchors to be used, and their ability to support 4 times the inverter's weight (4x22Kg=88Kg).
  Depending on the type of anchor chosen, drill the required 2 holes (A) to mount the bracket.

- Install the REACT2-UNO bracket (01) to the support.
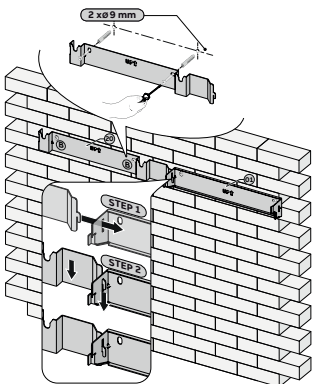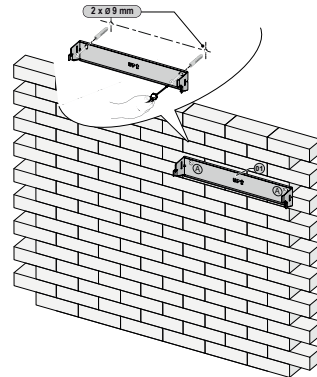
📖 **The underlying procedure is related to the side-by-side installation of REACT2-BATT. Alternatively, is possible to install the REACT2-BATT separately and at greater distances using the "REACT2-XL-CABLE-KIT" cable kit (2 meter cables length).**

- Position the REACT2-BATT bracket (20) so that it is perfectly level on the wall and use it as a drilling template. To aling the two brackets use the reference point and follow the steps as in the picture.

- It is the installer's responsibility to choose an appropriate type of screw anchors for the attachment points. The choice must be based on the type of support (wall, frame or other support), the type of anchors to be used, and their ability to support 4 times the inverter's weight (4x50Kg=200Kg).

- Depending on the type of anchor chosen, drill the required 2 holes (B) to mount the bracket.

- Install the REACT2-BATT bracket (20) to the support.

6. Mounting Instructions (continuation)

- Lift the REACT2-BATT up to the bracket and insert the heads of two anchor points (present on the back of the battery unit) into the slots ▽ on the bracket ⑳.

Risk of injury due to the heavy weight of the equipment.
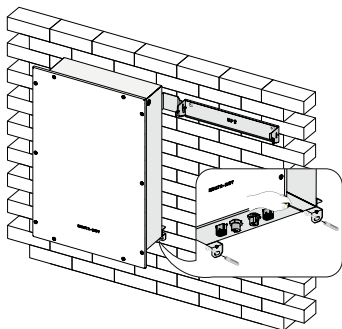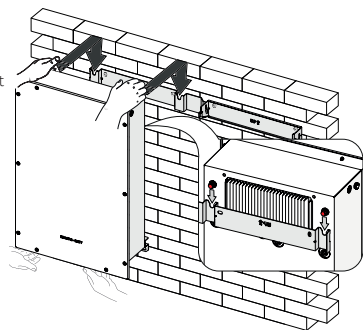
- Hang up the lower part of the REACT2-BATT to the wall using the two wall attachment point ㉖ (holes diameter 11 mm).

- Carefully lift the REACT2-UNO and hook it to the bracket ① by inserting the two supports in the slots on the inverter.

Risk of injury due to the heavy weight of the equipment.
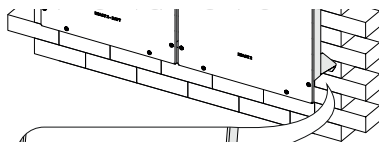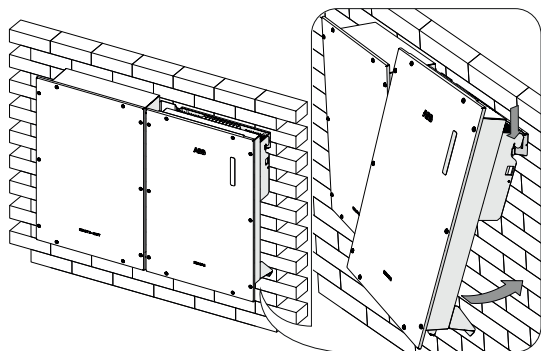
- Hang up the lower part of the REACT2-UNO to the wall using the one anchor point (hole diameter 11mm).
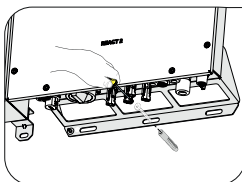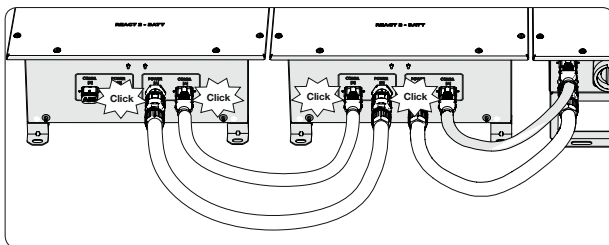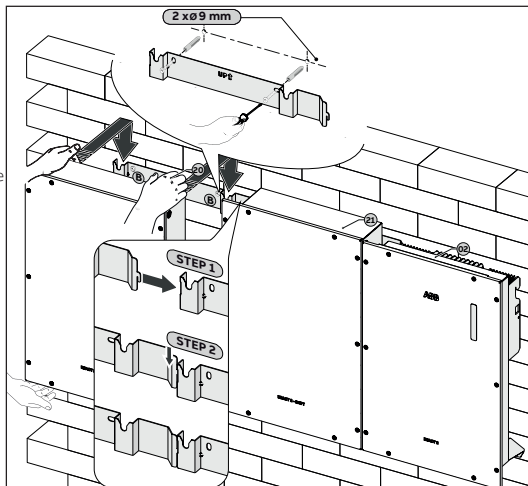
- Remove the caps from the battery and inverter connectors.

  - To remove the battery signal connectors ⑧ simply pull it.

  - To remove the battery power connectors ⑨ press the latch (highlighted in red) and pull it off.

To avoid risks of electrical shock and battery damage (notified by E097 error), all wiring operations must be carried out with AC disconnected and DC switch in OFF position.
Faulty units are considered out of warranty.

- Connect the two battery cables between inverter and battery unit (supplied inside the REACT2-BATT box).

- Give each cable a pull test to confirm the connection is secure.

8. Connection of the energy meter

 Warning – The meter must always be protected by fuses or circuit breakers on the incoming side. It is recommended that the input voltage sensing is protected by fuses rated 6A (gL–gG type) or by circuit breakers rated 6A (B/C type) installed near the meter.

 To avoid risks of electrical shock, all wiring operations must be carried out with the AC disconnect switch (or the supply meter) upstream of the meter disconnected.

Management of the storage system in order to optimise the energy self-consumption and self-sufficiency of the REACT2 system is based on the reading of the power by the meter. On the basis of the type of electric supply the following are available:

REACT-MTR-1PH (54) for single-phase grid up to 30 A.

ABB B21 (40) for single-phase grid up to 65 A.

ABB B23 (58) for three-phase grid up to 65 A (it can be used for single-phase grid if correctly installed).

ABB B24 (58) for three-phase supplies with an external current transformer (it can be used for mono-phase supplies if correctly installed).

The energy meter will communicate with the REACT2 through a dedicated serial line (RS485 METER).
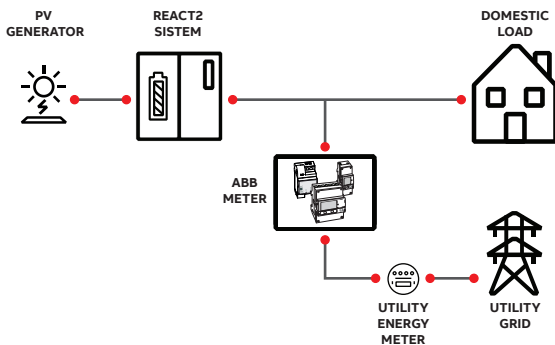
The connection of the RS485 METER line to the REACT2-UNO must be made using the dedicated METER connector (14).
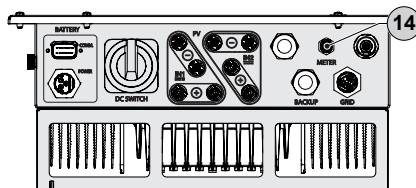
In the picture below are described the components of the counterpart connector and the relative torques:
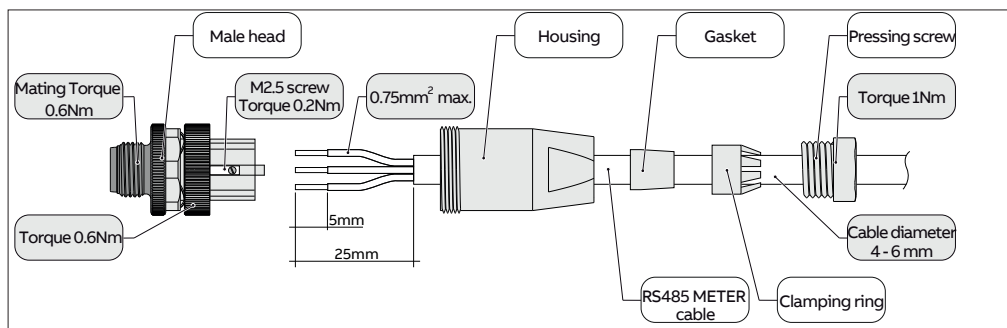
Follow the procedure to connect the RS485 cable to the counterpart (supplied) of the METER connector (14):
1. Disassembly the counterpart connector
2. Install all components on the RS485 cable
3. Strip the cable as indicated in the picture
4. Install the wire on the head of the connector following the indication below:

Screw terminal on the counterpart connector	RS485 METER signal
1	-T/R
3	+T/R
4	RTN

Turn the M2.5 screw with suitable screwdriver (torque 0.2Nm)
5. Install connector housing (torque 0.6Nm)
6. Install seal, pinch ring, pressing screw
7. Pressing screw should be tightened with torque 1Nm
8. Install the counterpart on the METER connector (14) by screwing the metallic ferrule (torque 0.6Nm). Give a pull test to confirm the connection is secure.

 The cable of the cable assembly must remain perpendicular to the connector and avoid an excessively sharp bend radius and loading. The maximum bend radius of a cable is ±10°.

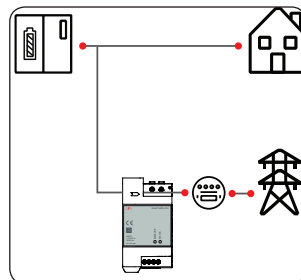# 8.1 Connection of the REACT-MTR-1PH

Connection of the REACT-MTR-1PH (single-phase):

The energy meter REACT-MTR-1PH (51) is a DIN rail device (3 modules) and must be installed where the electricity supply is single-phase
- Ensure that the AC line has been correctly disconnected upstream from the REACT-MTR-1PH. Check that there is no voltage by using a multimeter.
- Strip 8/10mm of sheathing from the connection cables of the AC power supply and connect the phase (L) and neutral (N) on the specific terminal block (53) set on the upper side of the meter; each individual terminal of the terminal block takes a cable with a maximum section from 0.5 to 4mm² (tightening torque of 0.5Nm).
- Connect the cables of the serial line (+T, -T and RTN) on the terminal block (54) (on the lower part of the REACT-MTR-1PH) respecting the correspondence between the signals of the serial line.

Serial line terminal block of the REACT-MTR-1PH (54)	Screw terminal on the counterpart connector
-T	1 (-T/R)
+T	3 (+T/R)
RTN	4 (RTN)

Each individual terminal of the terminal block takes a cable with a section from 0.14 to 1.5mm² (tightening torque of 0.5Nm).

- Subsequently the other side of the cable must be connected to the REACT2-UNO METER connector (14)
- Install the device on the DIN rail and ensure to trigger the fixing system on it
- Disconnect the phase cable (L) of the electric supply
- Insert the phase cable (L) through the hole (Ø8mm) on the REACT-MTR-1PH (51). The arrow corresponding to the hole for the feeding of the line cable (52), indicates the direction of insertion which must be complied with for correct measurement of the current; in fact the direction of the arrow indicates the supply point of the electric energy (as indicated in the diagram).

Checks for correct meter position

**1 - Turn off DC switch of REACT 2**
- Turn off REACT 2 DC switch.
- House consumption shall be greater than 50 W.
- Webserver user interface shall show power coming from grid (negative value, eg: - 1250 W).
  - If power is shown, ABB Meter can be in position (B) or (C) (if power sign is negative go to step 2 otherwhise adjust meter orientation)
  - If No power is shown (0 W). Meter is in position (A). Please install meter in the right place with correct orientation.

DC switch in OFF position — House consumption Loads are ON — Power flow
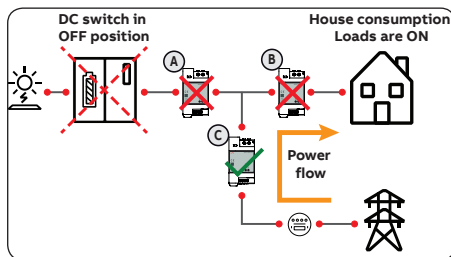
2 - Turn OFF all house loads
- Turn ON DC switch of REACT 2
- Turn off all the house loads.
- Webserver user interface shall show power flow to the grid with positive value (eg: + 1000 W) or power flow to charge battery.
  - If No Power is shown (0 W). Meter is in position (B) (WRONG). Install meter in the right one (C).
  - If power is shown with positive sign (red LED MEASURE is permanently ON) the meter is in the right position (C).

Inverter is ON — House consumption Loads are OFF — Power flow
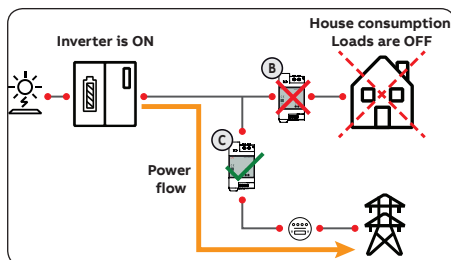
# 8.2 Connection and configuration of the ABB B21 meter (single-phase)

The energy meter ABB B21 (50) is a DIN rail device (2 modules) and must be installed where the electricity supply is single-phase.
- Disconnect the AC disconnect switch upstream of the meter.
- Strip the insulation of the cable for the length which is indicated on the meter (13mm).
- Connect the cables of the single-phase line in accordance with the layout printed on the meter (L and N) to the AC connection terminal block (60) (59) and tighten the screws (tightening torque 3.0 Nm).
- Connect the cables of the serial line A (37), B (36) and C (37) (set on the rear of the ABB B21 (50)) respecting the correspondence between the signals of the serial line and tighten the screws (torque 0.25 Nm):

Serial line terminal block of the meter ABB B21 (54)	Screw terminal on the counterpart connector
A (37)	1 (-T/R)
B (36)	3 (+T/R)
C (35)	4 (RTN)

- Subsequently the other side of the cable must be connected to the REACT2-UNO METER connector (14)
- Install the mater on the DIN rail and ensure to trigger the fixing system on it
- Once the phase of mechanical installation of the METER is finished, it is necessary to configure the METER in order to make it compatible with the REACT2 system. Set the parameters of the meter as set out in the table:

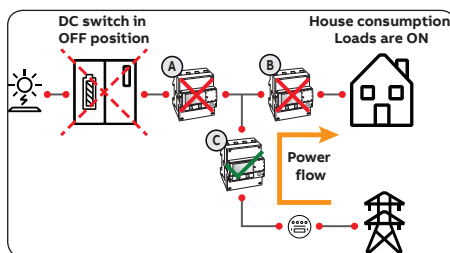| Parameter	Settings
Address	1
Protocol	MODBUS
Baudrate	19200
Parity	EVEN

The settings are made by using the keypad and the display on the meter:

1. Press for two seconds [OK] to access the setup menu of the meter.

2. Press repeatedly [▼] until the display shows "Set".
   - Press [OK] to confirm.

3. Press repeatedly [▼] until the display shows "RS-485".
   - Press [OK] to confirm.

4. Press repeatedly [▼] until the display shows "Protocol".
   - Press [OK] to access.
   - Press [SET] to enable the change in the value.
   - Press repeatedly [▼] until the display shows "Modbus".
   - Press [OK] to confirm the change.
   - Press for two seconds [OK] to return to the RS485 menu.

5. Press repeatedly [▼] until the display shows "Baud rate".
   - Press [OK] to access.
   - Press [SET] to enable the change in the value.
   - Press repeatedly [▼] and select 19200.
   - Press [OK] to confirm the change.
   - Press for two seconds [OK] to return to the RS485 menu.

6. Press repeatedly [▼] until the display shows "Address".
   - Press [OK] to access.
   - Press [SET] to enable the change in the value.
   - Press repeatedly [▼] and select 1.
   - Press [OK] to confirm the change.
   - Press for two seconds [OK] to return to the RS485 menu.

7. Press repeatedly [▼] until the display shows "Modbus".
   - Press [OK] to access.
   - Press [SET] to enable the change in the value.
   - Press repeatedly [▼] and select even.
   - Press [OK] to confirm the change.
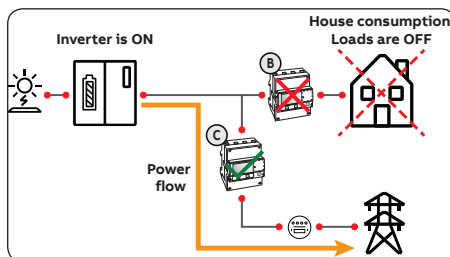
Checks for correct meter position

1 - Turn off DC switch of REACT 2
- Turn off REACT 2 DC switch.
- House consumption shall be greater than 50 W.
- Webserver user interface and meter display shall show power coming from grid (negative value, eg: - 1250 W).
  - If power is shown, ABB Meter can be in position (B) or (C) (if power sign is negative go to step 2 otherwise adjust meter orientation)
  - If No power is shown (0 W). Meter is in position (A). Please install meter in the right place with correct orientation.

DC switch in OFF position
House consumption Loads are ON
Power flow

2 - Turn OFF all house loads
- Turn ON DC switch of REACT 2
- Turn off all the house loads.
- Webserver user interface shall show power flow to the grid with positive value (eg: + 1000 W) or power flow to charge battery.
  - If No Power is shown (0 W). Meter is in position (B) (WRONG). Install meter in the right one (C).
  - If power is shown with positive sign the meter is in the right position (C).

Inverter is ON
House consumption Loads are OFF
Power flow
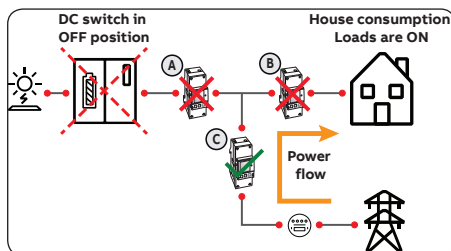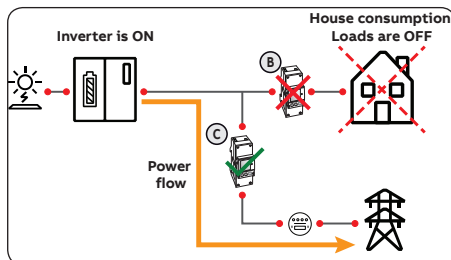
8.3 Connection and configuration of the REACT-MTR-3PH (three-phase)

The energy meter (55) is a DIN rail device (4 modules) and must be installed where the electricity supply is three-phase.
• Disconnect the AC disconnect switch upstream of the meter.
• Strip the insulation of the cable for the length which is indicated on the meter (13mm).
• Connect the cables of the three-phase line in accordance with the layout printed on the meter (L1, L2, L3 and N) to the three-phase connection terminal block (56) (59) and tighten the screws (tightening torque 2.0 Nm).

> **Take note of the phase to which the REACT2 system is connected; this information will be requested when the system is commissioned.**

• Connect the cables of the serial line A (37), B (36) and C (37) on the terminal block (57) set on the rear of the meter (55) respecting the correspondence between the signals of the serial line and tighten the screws (torque 0.25 Nm) and tighten the screws (tightening torque 0.25 Nm):
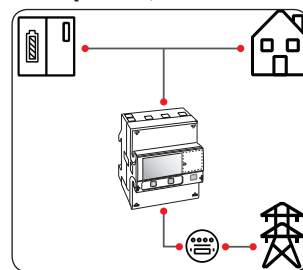
Serial line terminal block of the meter ABB B23, B24 (60)	Screw terminal on the counterpart connector
A (37)	1 (-T/R)
B (36)	3 (+T/R)
C (35)	4 (RTN)

• Subsequently the other side of the cable must be connected to the REACT2-UNO METER connector (14)
• Install the device on the DIN rail and ensure to trigger the fixing system on it
• Once the phase of mechanical installation of the METER is finished, it is necessary to configure the METER in order to make it compatible with the REACT2 system. Set the parameters of the meter as set out in the table:

Parameter	Settings
Address	1
Protocol	MODBUS
Baudrate	19200
Parity	EVEN

The settings are made by using the keypad and the display on the meter:

1. Press for two seconds [OK] to access the setup menu of the meter.
2. Press repeatedly [▼] until the display shows "Set".
   - Press [OK] to confirm.
3. Press repeatedly [▼] until the display shows "RS-485".
   - Press [OK] to confirm.
4. Press repeatedly [▼] until the display shows "Protocol".
   - Press [OK] to access.
   - Press [SET] to enable the change in the value.
   - Press repeatedly [▼] until the display shows "Modbus".
   - Press [OK] to confirm the change.
   - Press for two seconds [OK] to return to the RS485 menu.
5. Press repeatedly [▼] until the display shows "Baud rate".
   - Press [OK] to access.
   - Press [SET] to enable the change in the value.
   - Press repeatedly [▼] and select 19200.
   - Press [OK] to confirm the change.
   - Press for two seconds [OK] to return to the RS485 menu.

6. Press repeatedly [▼] until the display shows "Address".
   - Press [OK] to access.
   - Press [SET] to enable the change in the value.
   - Press repeatedly [▼] and select 1.
   - Press [OK] to confirm the change.
   - Press for two seconds [OK] to return to the RS485 menu.
7. Press repeatedly [▼] until the display shows "Modbus".
   - Press [OK] to access.
   - Press [SET] to enable the change in the value.
   - Press repeatedly [▼] and select even.
   - Press [OK] to confirm the change.

Checks for correct meter position

1 - Turn off DC switch of REACT 2
• Turn off REACT 2 DC switch.
• House consumption shall be greater than 50 W.
• Webserver user interface and meter display shall show power coming from grid (negative value, eg: - 1250 W).
   - If power is shown, ABB Meter can be in position (B) or (C) (if power sign is negative go to step 2 otherwhise adjust meter orientation)
   - If No power is shown (0 W). Meter is in position (A). Please install meter in the right place with correct orientation.

2 - Turn OFF all house loads
• Turn ON DC switch of REACT 2
• Turn off all the house loads.
• Webserver user interface shall show power flow to the grid with positive value (eg: + 1000 W) or power flow to charge battery.
   - If No Power is shown (0 W). Meter is in position (B) (WRONG). Install meter in the right one (C).
   -If power is shown with positive sign the meter is in the right position (C).

9. Line cable and protection devices

Load protection breaker (AC disconnect switch) and line cable sizing

To protect the inverter and the AC connection line, a device must be installed to protect against maximum current and leakage to ground, with the following characteristics:

	REACT2-UNO-3.6	REACT2-UNO-5.0
Type	Automatic circuit breaker with thermal-magnetic protection	
Nominal Voltage	230 Vac	
Nominal Current	25 A	32 A
Magnetic protection characteristic	B/C	
Number of poles	2	
Type of differential protection	A/AC	
Differential sensitivity	300 mA	

In case of installation of a residual current protection device must meet the following characteristics:

	REACT2-UNO-3.6	REACT2-UNO-5.0
Number of poles	2	
Type of differential protection	A/AC	
Differential sensitivity	300 mA	

ABB declares that the ABB transformerless inverters, in terms of their construction, do not inject continuous ground fault currents and therefore there is no requirement that the differential protection installed downstream of the inverter be type B in accordance with IEC 60755 / A 2.

Characteristics and sizing of the line cable

To connect the inverter to the grid you need 4 connections: ground, neutral, phase and external grounding protection In any case, connection of the inverter to ground is mandatory.
The connection of the grid cable to the inverter is realised through the dedicated AC output connector ⑰ by carrying out the following operations:
• Characteristics and sizing of the line cable
• Installation of the cable on the AC output connector counterpart
• Connection of the AC output connector to the inverter
The cross-section of the AC line conductor must be sized in order to prevent unwanted disconnections of the inverter from the grid due to high impedance of the line that connects the inverter to the power supply point.
In order to allow installation of the grid cable inside the AC output connector ⑳, the sizings indicated in the figure must be observed.
The table shows the maximum line conductor length in relation to the section of the conductor itself:

Cross-section of the line conductor (mm²)	Maximum length of the line conductor (mt)	
	REACT2-UNO-3.6	REACT2-UNO-5.0
1.5	5 m	-
2.5	10 m	6 m
4	16 m	10 m
6	24 m	16 m

The values are calculated in nominal power conditions, taking into account:
1. a power loss of not more than 1% along the line.
2. copper cable, with HEPR rubber insulation, laid in free air

max. 6 mm²
Ø10÷14mm
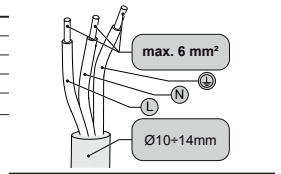
10. Output connection (AC)

⚠ **To avoid risks of electrical shock, all wiring operations must be carried out with the disconnect switch downstream of the inverter (grid side) opened and applying LOTO procedure on it.**

Installation of the cable on the AC output connector:

• Remove the head of the connector by pressing on the two holding clips and subsequently loosen the cable gland.
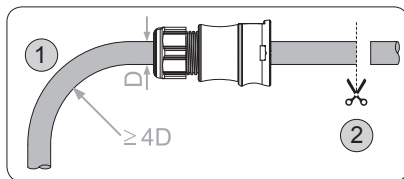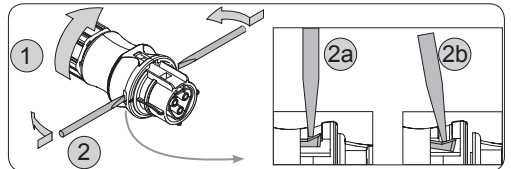
• Feed the cable through the connector and cut the cable to size. Ensure that the cable's radius of curvature is more than 4 times the diameter of the cable

• Prepare the cable respecting the following measurements. It's possible to use both stranded or solid wire but the requirements are different.
The use of stranded wire with a conductor section values between 1.5 - 4 mm² are only allowed with the mandatory use of properly crimped ferrules.

Y	X
⏚ 30mm L,N 25 mm	12mm with ferrules* 8mm without ferrules*
	z: 10mm max

Max 6 mm²
Ø10÷14mm
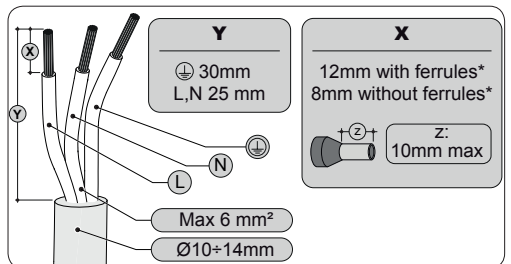
- Install the single wires (phase, neutral and ground) on the head of the connector respecting the indications printed on each of the three connection terminals (tightening torque 0.8...1Nm)
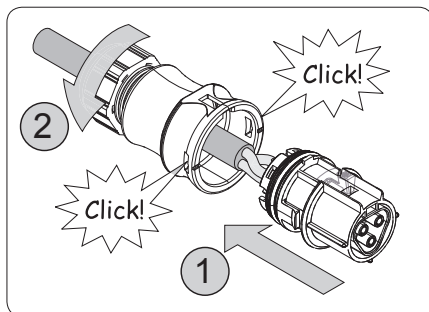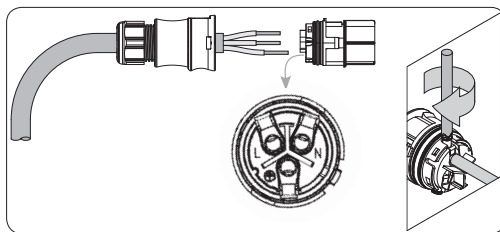
- Close the connector and tighten the cable gland respecting the tightening torque (4+1Nm) in order to guarantee the IP65 protection level

- Connection for the AC output connector to the inverter:
  For all inverter models, connection to the electrical grid is carried out using the AC output connector (17).
  1. Remove the pre-installed protective cover on the inverter by pressing on the the latch with a flat screwdriver.
  2. Insert the counterpart in the AC output (GRID) connector (17) being careful to align the reference points (present on both connectors) which prevent connection errors.
  3. Push the counterpart until you hear "click"
  4. Give a pull test to confirm the connection is secure.
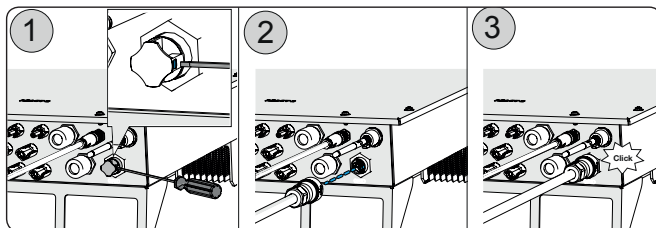
⚠ **In addition, the connector must not be subject to tensile forces (examples: do not connect weights to the AC cable, do not leave excess cable windings hanging, etc).**
In order to maintain the inverter's level of IP protection, the corresponding part must be installed with the AC cable connected or the protective cover, on the AC output connector.

- Installation of the external protective grounding cable:
  In addition to the grounding protection previously connected to the AC output connector (17) is necessary to:
  - install a second protective grounding cable to the dedicated connection point on the metal frame (lower part) of the REACT2-UNO.
  - install a jumper between the protective grounding connection points on REACT2-UNO and REACT2-BATT

  To execute all external grounding connection, follow the procedure described below:
  1. Make a jumper earth cable using the two cable lugs supplied (minimum cross-section not less than 4mm²). The cable must be long enough to connect the REACT2-UNO external protective earth (11) to the REACT2-BATT external protective earth [A] (25).
  2. From among the components supplied, find the M5 nut, M5 flat washer and M5 serrated lock washer.
  3. Install the earth cables following the below installation sequence

Installation sequence:
knurled washers
external protective earth cable
jumper earth cable
flat washer
M5 nut (torque of 4.1 Nm)

4. Connection on REACT2-BATT external protective earth [A] (25).
   Follow the below installation sequence

Installation sequence:
knurled washers
jumper earth cable
flat washer
M5 nut (torque of 4.1 Nm)
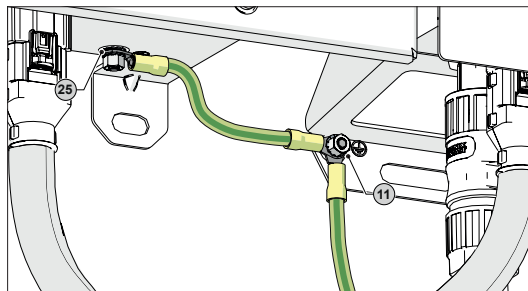
11. Backup cable and protection devices

Load protection breaker (AC disconnect switch) and cable sizing (BACKUP output)

To protect the AC connection for the the backup output of the inverter, we recommend installing a device for protection against over current and leakage with the following characteristics:
ABB declares that the ABB transformerless inverters, in terms of their construction, do not inject continuous ground fault currents and therefore there is no requirement that the differential protection installed downstream of the inverter be type B in accordance with IEC 60755 / A 2.

	REACT2-UNO-3.6/5.0
Type	Automatic circuit breaker with differential thermal magnetic protection
Nominal Voltage	230 Vac
Nominal Current	32 A
Magnetic protection characteristic	B/C
Number of poles	2
Type of differential protection	A/AC
Differential sensitivity	30 mA

Characteristics and sizing of the cable (BACKUP output)

Three-pole cable required. The cross-section of the AC line conductor must be sized in order to prevent unwanted disconnections of the inverter from the grid due to high impedance of the line that connects the inverter to the power supply point.

Cross-section of the line conductor (mm²)	Maximum length of the line conductor (mt)
1.5	6 m
2.5	11 m
4	19 m

The values are calculated in nominal power conditions, taking into account:
1. a power loss of not more than 1% along the line.
2. copper cable, with HEPR rubber insulation, laid in free air

max 4 mm²
L N ⏚
10 ÷ 17 mm
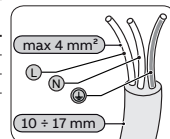
12. Backup output connection (AC)

⚡ **Warning! Before performing any of the operations described below, ensure the AC line downstream the inverter has been correctly disconnected**

⚡ **Warning! ABB inverters should be earthed (PE) via the terminal with the protective earth label ⏚, using a cable with an appropriate cross-section of the conductor for the maximum ground fault current that the generating system might experience**

The REACT2 system is equipped with an AC BACKUP output that can be activated in different 2 ways:
• Backup Mode: AUTO
  Automatic activation in case of loss of main (blackout).
• Backup Mode: External Control
  Is used for activating the output:
  - External command/signal (Communication and control signal terminal block **16**, terminal 1-3).
The selection of the backup mode is performed during the commissioning wizard.

📖 **See the "REACT2-Backup output use" document on the ABB site for more information**

To connect the BACKUP output of the inverter, 3 connections are necessary: ground, neutral and phase. In any case, connection of the inverter to ground is mandatory.

• Install the filter (supplied with the inverter) on the internal side of AC output (BACKUP) cable gland **16** (side inside the REACT2-UNO).
  The installation is carried out:
  - **a** position the filter on the internal side of the cable gland
  - **b** Screw the filter on the thread of the cable gland
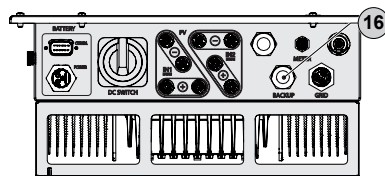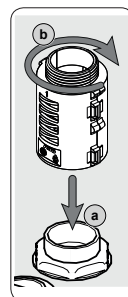
• Insert the backup cable into the REACT2 using the AC output (BACKUP) cable gland **16** (M25 with toroid) and make the connections to the AC output (BACKUP) screw terminal block **42**.
Use a properly sized tripolar cable and check the tightness of the AC output (BACKUP) cable gland **16** at the end of the installation.

For all the models the connection is made with the AC output terminal block **42**.
• Strip 10mm of sheathing from the cables and then insert into the inverter the cable, making it pass through the AC output (BACKUP) cable gland **16**; the maximum diameter of the cable accepted by the cable gland is from 10 to 17 mm².
• Connect on the AC output (BACKUP) screw terminal block **42** the ground cable (yellow-green) to protect against contact marked by the symbol ⏚, the neutral cable (usually blue) to the terminal marked by the letter N and the phase cable to the terminal marked by the screen-print L; every individual terminal of the terminal block accepts a cable with maximum section of 4 mm² (It is necessary to fix the AC cables to the terminal block with a tightening torque of at least 1,5 Nm).

• Once the connection to the terminal block has been made, firmly screw the cable gland (7.5 Nm tightening torque) and check the tightness.
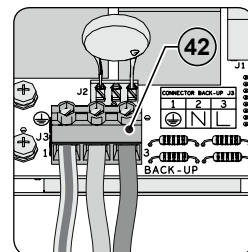
13. Input configuration (DC)

All versions of the inverter are equipped with two input channels (therefore with double maximum power point tracker MPPT) independent of each other, which can however be connected in parallel using a single MPPT.

Independent channel configuration (default configuration)

This configuration uses the two input channels (MPPT) independently.
This means that the jumper (supplied) between the positive poles of the DC (IN1 and IN2) connectors ㉜ must not be installed and that the mode which must be selected during the guided setup for commissioning the system is "INDEPENDENT".
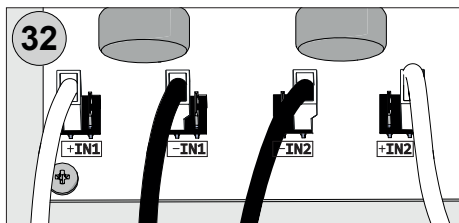
Parallel channel configuration

This configuration uses the two input channels (MPPT) connected in parallel. This means that the jumper (supplied) between the positive poles of the DC (IN1 and IN2) connectors ㉜ must be installed and that the mode which must be selected during the guided setup for commissioning the system is "PARALLEL".
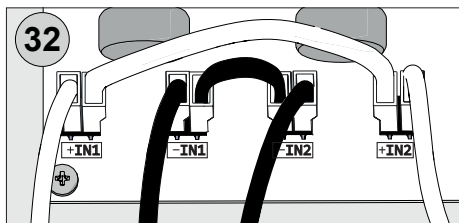
14. Input connection (DC)

Check for correct polarity in the input strings and absence of any leakage to ground in the PV generator. When exposed to sunlight, the PV panels supply DC direct voltage to the inverter. The inside of the inverter may only be accessed after the equipment has been disconnected from the grid and from the photovoltaic generator.

Warning! The inverters to which this document relates to are WITHOUT ISOLATION TRANSFORMER (transformer-less). This type involves the use of insulated photovoltaic panels (IEC61730 Class A Rating) and the need to maintain the photovoltaic generator floating with respect to earth: no pole of the generator must be connected to earth.

To avoid risks of electrical shock, all wiring operations must be carried out with the DC disconnect switch internal and external (if present, applying LOTO procedures on it) to OFF position and with the external AC disconnect switch to OFF position (applying LOTO procedures on it).

For the connections of the strings the quick fit connectors (one for each pole of each string) located on the lower side of the REACT2-UNO are used.
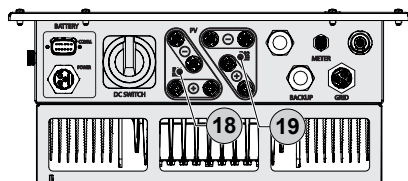
- Connect all the strings required by the system, always checking the seal of the connectors.
  The number of connections for each input channel is 2 pairs of connectors.
- Give a pull test to confirm the connection is secure.

Connect directly the individual input strings to the REACT2-UNO. Should it be necessary to make parallel strings outside the inverter, the maximum current allowed by the individual quick fit connector must be respected, which is 18A.

Polarity inversion can cause serious damage. Check polarity before connecting each string!
According to the system configuration, check the correct setting of the channels to independent or in parallel mode. An incorrect setting of the input channels can lead to loss of energy production.

- If any string inputs are not required, you must ensure that covers are installed to the connectors, and install any which are missing. This is necessary both for the inverter grade IP seal, and to avoid damage to the free connector which may be used at a later time.

15. Connection of the communication and control signals
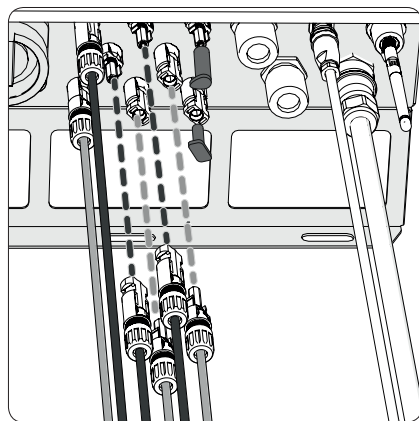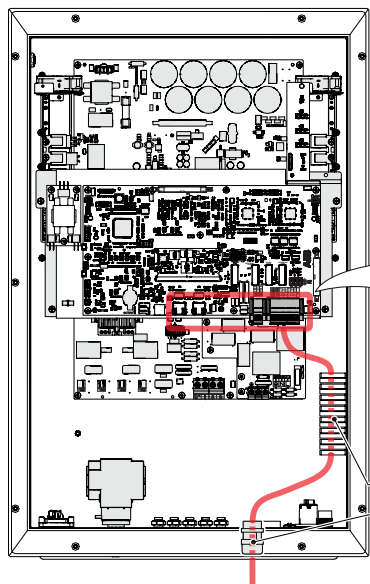
A communication and control service cable that must be connected inside the REACT2-UNO must pass through:
- the service cable gland ⑬.
- the cable conduit ㊹.

It is a M25 service cable gland ⑬ and can take a cable with a diameter of 10 mm to 17 mm (tightening torque 7.0Nm).
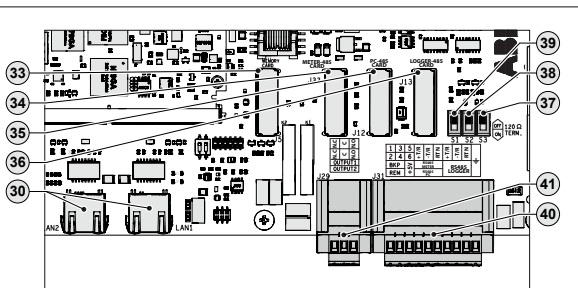
Terminal name	Terminal number	Description of communication and control signal screw terminal block ㊵
BKP	1, 3	External backup command
REM	2, 4	Remote external ON/OFF command
+5V	5, 6	Auxiliary 5V positive
RS485 METER	7	+T/R RS485 METER (connected on the external meter connector ⑭)
	9	-T/R RS485 METER (connected on the external meter connector ⑭)
	11	Reference (RTN) RS485 METER (connected on the external meter connector ⑭)
RS485 PC (ABB service use only)	8	+T/R of the RS485 PC communication line (ABB service use only)
	10	-T/R of the RS485 PC communication line (ABB service use only)
	12	Reference (RTN) of the RS485 PC communication line (ABB service use only)
RS485 LOGGER	13, 14	+T/R of the RS485 LOGGER communication line
	15, 16	-T/R of the RS485 LOGGER communication line
	17, 18	Reference (RTN) of the RS485 LOGGER communication line
⏚	19, 20	Ground terminal

Terminal name	Terminal number	Description of multifunction relay screw terminal block ㊶
OUTPUT 1	N.C.	"Normally closed" terminal of multifunctional relay (OUTPUT 1)
	C	"Common" terminal of multifunctional relay (OUTPUT 1)
	N.O.	"Normally open" terminal of multifunctional relay (OUTPUT 1)
OUTPUT 2	N.C.	"Normally closed" terminal of multifunctional relay (OUTPUT 2)
	C	"Common" terminal of multifunctional relay (OUTPUT 2)
	N.O.	"Normally open" terminal of multifunctional relay (OUTPUT 2)

Terminal name	Terminal number	Description of RJ45 (LAN) connectors ㉚
LAN 1	RJ45	LAN Ethernet connector
LAN 2	RJ45	LAN Ethernet connector

📖 **For further information regarding the configuration and use of the communication and control signals terminal block, please see the manual**

External backup command connection
The REACT2 system is equipped with a BACKUP AC output that can be activated in two different ways (Auto or via external control) settable via web server user interface.
In case of external control (BKP terminals) selection, backup output is activated when terminal 1 is brought to the same potential as terminal 3 (i.e. positioning a switch to create a short circuit between the two terminals).

Remote control connection (REM)
The connection and disconnection of the inverter to and from the grid can be controlled through an external control.
The function must be enabled via web server user interface. If the remote control function is disabled, the switching on of the inverter is dictated by the presence of the normal parameters that allow the inverter to connect to the grid.
If the remote control function is on, besides being dictated by the presence of the normal parameters that allow the inverter to connect to the grid, switching on the inverter also depends on the state of REM terminals (terminal 2 and terminal 4) on the communication and control signal terminal block ㊵.
When terminal 2 is brought to the same potential as terminal 4 (i.e. positioning a switch to create a short circuit between the two terminals), the inverter is disconnected from the grid.

+5V output connection
On the communication and control signal terminal block ㉑ there is auxiliary voltage of +5V.
The maximum absorption permitted from this auxiliary power supply voltage is 100 mA.

Connection of RS485 LOGGER serial communication line
The RS485 LOGGER serial communication line on the communication and control signal terminal block ㊵ is reserved for the connection of the inverter to monitoring devices that communicate with the Modbus communication protocol. On the communication and control signal terminal block ㊵ there are two connection points for each serial line signal (+T/R, -T/R and RTN) so as to be able to make a daisy-chain connection ("in-out") of multiple inverters. Connection of a monitoring system to the RS485 LOGGER communication line consists of first connecting all the units in the chain in the "daisy-chain" ("in-out") configuration, respecting corresponding signals, and then activating the communication line termination resistance in the last element in the chain by setting the RS485-LOGGER line termination switch ㊲ (to the ON position).

⚠️ **For long distance connections, it is preferable to use a shielded twisted pair cable with characteristic impedance of Z0=120 Ohm like the one shown in the following table:**

Signal	Symbol
Positive data	+T/R
Negative data	-T/R
Reference	RTN
Shield	⏚
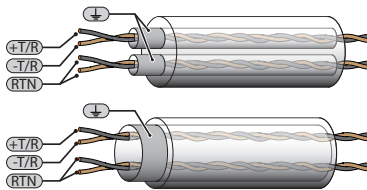
Configurable Relay connection (OUTPUT 1 and OUTPUT 2)
The inverter is equipped with 2 multifunction relays with configurable activation. It can be connected with normally open contact (being connected between the NO terminal and the common contact C) and with normally closed contact (being connected between the NC terminal and the common contact C). This multifunction relays can be used in different operating configurations that can be selected by accessing the web server user interface
Different types of devices (light, sound, etc.) can be connected to the relay, provided they comply with the following requirements:
- Alternating current
  Maximum Voltage: 240 Vac / Maximum Current: 1 A
- Direct current
  Maximum Voltage: 30 Vdc / Maximum Current: 0.8 A
- Cable requirements
  Conductor cross-section: from 0.14 to 1.5 mm^2

⚠️ **The ALARM contact can be used only with systems that ensure a safety isolating additional at least (supplementary insulation in relation to the DC input voltage)**

Ethernet connection
The ethernet connection allows a direct data transfer to the ABB server for monitoring purpose.
When the inverter will be powered on, network parameters are automatically set and the inverter starts transmitting telemetry data to the Aurora Vision® CLOUD platform.

The connection of the ethernet communication cable must be made on the specific connectors �30 located on the communication and control board inside the REACT2-UNO ㉒. If the inverters of the plant need to be connected in daisy chain or ring configuration use both connectors.
The cable should be compliant to the following specification:
- Cable type: Patch or Cross type, 100BaseTx, CAT5e (or higher) with shielding STP or FTP.
- UV-resistant if used outdoors
- Type of plug: metallic shielded RJ45
- The maximum length that can reach these cables is 100 meters, and it is always advisable not to let them pass by the power cords to avoid interference with data transmission.
- Maximum inverters number connected over one single daisy chain is 40
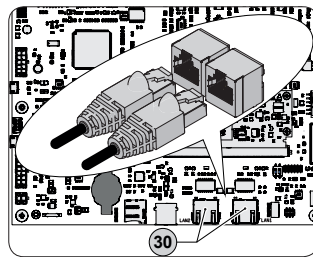
⚠️ **In order to avoid ground loop (that could create communication issues) the shield of any Ethernet cable must be connected to the RJ45 plug in only one side, the other side of the shield should be leaved floating. This could be guaranteed by crimping the shield or the screen of the ethernet cable to the RJ45 connectors only at one end of each cables.**
Three topologies of ethernet connection to the router are available:
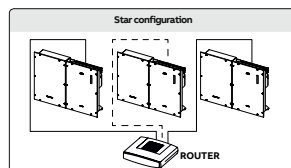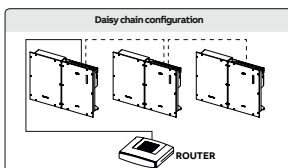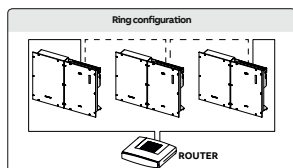
The ring configuration is the preferable way to connect the units in order to allow reaching inverters in case of single inverter fault.
In case inverters are connected to the networking switch with a ring topology is recommended to enable SPT protocol on the switch

On each configuration of connection the maximum length of the cable must be 100m maximum between inverter – inverter and inverter – switch.
Please refer to Aurora Vision documents available on ABB website for further information how to get an Aurora Vision account for remotely monitoring and managing the installed solar assets.

16. Description of the synoptic

The synoptic **03** functions on the inverter are described below.

Synoptic icon	Description
⏻	Indicates the status of the inverter's grid connection
🌐	Indicates the status of the WI-FI or ETHERNET communication lines.
📟	Communication status with external meter
🔋	Communication status with batteries
⚠️	Indicates that the inverter has detected an anomaly. The type of problem is highlighted in the Web User Interface .
⚡	The "GFI" (ground fault) LED indicates that the inverter has detected a ground fault in the DC side photovoltaic generator.
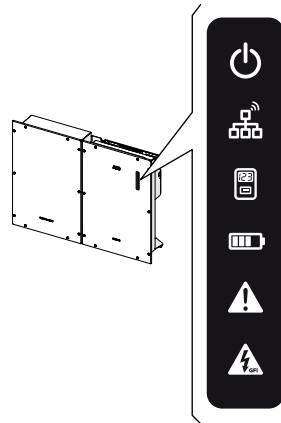
The icons of the synoptic **03** on the front panel can behave in different ways depending on the inverter's operating state.

All possible icon activation combinations are shown in the following table. In particular, each icon could behave in one of the following ways:

◯ = icon on

⊗ = icon flashing (slow)

✳ = icon flashing (fast)

◯ = icon off

✳ = Any one of the conditions described above

Icon status 🌐		Operating state
🌐	◯	Wireless not configured or/and Ethernet cable not connected.
🌐	⊗	Scanning for available wireless networks.
🌐	✳	Trying to connect to a network (wifi or ethernet)
🌐	●	Inverter is connected to the network via wifi or ethernet

Icon status 📟		Operating state
📟	◯	"No meter" has been configured during commissioning
📟	●	Meter is communicating
📟	●	Meter configured and is not communicating

Icon status 🔋		Operating state
🔋	◯	No battery has been commissioned
🔋	⊗	Charging
🔋	✳	Discharging
🔋	●	Idle - sleep
🔋	●	Fault
🔋	●	End of battery life reached

16. Description of the synoptic (continuation)

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Icons status ⏻ ⚠ ⚠	Operating state
⏻ ⊗(green) / ⚠ ⊗(yellow) / ⚠ ⊗(red)	**Firmware programming** The inverter firmware is being programmed
⏻ ○ / ⚠ ○ / ⚠ ○	**Night mode (inverter automatically switches off)** The inverter is in night time switch-off mode (input voltage less than 70% of the set start-up voltage).
⏻ ⊗(green) / ⚠ ○ / ⚠ ○	**Inverter initialisation** This is a transitional state due to the verification of the operating conditions. During this stage the inverter checks that the conditions for connecting to the grid are met.
⏻ ●(green) / ⚠ ○ / ⚠ ○	**The inverter is connected and feeds power into the grid** Normal operation. During this stage, the inverter automatically tracks and analyses the photovoltaic generator's maximum power point (MPP).
⏻ ⊗(green) / ⚠ ●(yellow) / ⚠ ○	**Disconnection from the grid** Indicates no grid voltage. This condition does not allow the inverter to connect to the grid
⏻ ✳(green) / ⚠ ●(yellow) / ⚠ ○	**Indication of Warning (W message codes) or Error E warning codes)** Indicates that the inverter control system has detected a warning (W) or error (E).
⏻ ●(green) / ⚠ ●(yellow) / ⚠ ○	**Backup operating modes** Depending on the different modes that can be set, and after detecting the conditions required for the output to be enabled, the system went into backup operation
⏻ ○ / ⚠ ⊗(yellow) / ⚠ ○	**Blackstart operating mode**
⏻ ✳(green) / ⚠ ⊗(yellow) / ⚠ ○	• **Ventilation anomaly** Indicates an anomaly in the operation of the internal ventilation system that could limit output power at high ambient temperatures. • **Failed association of internal inverter components (after replacement)** Indicates that the installed wiring box (only if replacing the inverter) was already associated with another inverter and that it cannot be associated with the new inverter. • **Overvoltage surge arresters triggered (where fitted)** Indicates that any class II overvoltage surge arresters installed on the AC or DC side have been triggered • **String protection fuses triggered (where fitted)** Indicates that one or more input string protection fuses that may be installed have been triggered • **Autotest (for Italian grid standards only)** The inverter is performing an Autotest
⏻ ○ / ⚠ ○ / ⚠ ●(red)	• **Anomaly in the insulation system of the photovoltaic generator** Indicates that a leakage to ground from the PV generator has been detected, causing the inverter to disconnect from the grid. • Indicates an operating anomaly in the battery unit

⚠️ **Before proceeding with commissioning, make sure you have carried out all the following checks:**
- **Check the correct connection and polarity of the DC inputs, and the correct connection of the AC output and ground cables.**
- **Check the correct connection of the power and signal cables between REACT2-UNO and REACT2-BATT**
- **Check the sealing barrier of the cable ducts and installed quick-fit connectors to prevent accidental disconnections and/or avoid compromising the IP65 environmental protection rating.**

Commissioning is carried out via Wi-Fi connection to the REACT2's internal web user inteface. Initial setup of the REACT2 system must therefore be carried out via a tablet, notebook or smartphone with a Wi-Fi connection.
To establish the connection and operate with the REACT2, it is necessary to power up the inverter by connecting its input to the DC voltage of the photovoltaic panels or its output to the AC grid.

• Supply the inverter with DC input voltage from the photovoltaic generator and/or via AC GRID voltage.

⚠️ **Where the system is powered by the photovoltaic generator (DC) make sure irradiation is stable and adequate for the REACT2's commissioning procedure to be completed.**

SN WLAN: SSSSSSSSSS
PN WLAN: PPP.PPPPP.PP
MAC: XX:XX:XX:XX:XX:XX

Remove and apply on the Quick installation guide **1**
SN Inverter: SSSSSSSSSS
MAC: XX:XX:XX:XX:XX:XX
PK: KKKK-KKKK-KKKK-KKKK

• Pre-commissionig phase 1 - Connection to the local Wi-Fi network
- DEVICE USED TABLET/SMARTPHONE.
Once powered, launch a QR reader for mobile and SCAN the QR code marked with **1** on the label on the right side of the inverter and connect to inverter network (tap connect).
The name of the Wi-Fi network created by the system, that the connection should be established with, will be: ABB-XX-XX-XX-XX-XX-XX (where the X is the MAC address)
After this step wait 10 seconds to allow the WLAN connection

- DEVICE USED LAPTOP.
Enable the wireless on the device you are using for the commissioning and search for the network named ABB-XX-XX-XX-XX-XX-XX, where "X" is an hexadecimal number of the MAC Address (the MAC Address is indicated on the "wireless identification label" on the side of the inverter).
When prompted, type the PK (product key), including the dashes. Example: 1234-1234-1234-1234 as the network password.

• Pre-commissionig phase 2 - Internal web UI access
- DEVICE USED TABLET/SMARTPHONE.
SCAN this QR code (it is also reported in the inverter pre-commissioning flyer inside the box of the REACT2-UNO). An internet browser page showing the step by step procedure will be open.

📖 **The information contained in this QR code is the IP address of the web user interface of the inverter: http://192.168.117.1**
Recommended browsers: Chrome from v.55, Firefox from v.50, Safari from V.10.2.1

- DEVICE USED LAPTOP.
Open an internet browser page and insert http://192.168.117.1 on the address bar.

STEP BY STEP COMMISSIONING WIZARD:

📖 **The screens shown below pertain to a tablet with the Android operating system. Screens on other devices or operating systems may differ.**

Administrator account

Create Administrator Account

admin

Password

••••••••

Confirm Password ●

••••••••

Passwords match

User account

Create User Account

user

☐ No user password

Password

••••••••

Confirm Password ●

••••••••

Passwords match

• **STEP 1 - Administrator/User login credentials**

- Set the Administrator account user and password (minimum 8 character for password): Administrator account can open and view the contents of photovoltaic site. Additionally, they can make changes to inverter settings. User and password are CASE SENSITIVE.

- Set the User account user and (optional) password (minimum 8 character for password): User account can only read data. It cannot make any changes. User and password are CASE SENSITIVE.

- Click on "Next" button to proceed to the next stage of the configuration wizard.

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17. Commissioning (continuation)

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- **STEP 4 - Type of coupling, Inverter country standard, Input mode, Meter and Energy policy, Battery and Backup mode configuration**

System configuration
- DC coupled (new installations). Select this mode if the inverter is con-
nected to the AC network and to the photovoltaic generator.
- AC coupled (retrofit with existing solar inverters). Select this mode if the inverter is connected only to
the AC network and in combination with a standard inverter connected to the photovoltaic generator.

Country standard
Set the grid standard of the country in which the inverter is installed.

⚠ **From the moment that the grid standard is set, you have 24 hours to make any changes to the value, after which the "Country Select > Set Std." functionality is blocked, and the remaining time will have to be reset in order to have the 24 hours of operation available again in which to select a new grid standard (follow the procedure "Resetting the remaining time for grid standard variation" described in the relevant section).**

Input mode (not available if "AC coupled" system configuration was selected)
- Indipendent
- Parallel
See the relevant section of this guide to know how to physically set the input mode

Meter
When a meter device is connected to the inverter, it's requested to select the meter model:
- Meter Model:
None (where system is installed without meter)
REACT-MTR-1PH (single-phase)
ABB 3PH (three-phase)
ABB 1PH (single-phase)

📖 **If a 3PH energy meter (ABB B23, B24) is used in the system as single-phase inverter, it will be necessary to select ABB 3PH and the phase to which the inverter is connected.**

If the selected meter is three-phase additional requested fields will appear:
- Meter Phase: select the phase to which the inverter is connected.
When a meter type is selected is possible to set also the Energy Policy fields that allows to manage the energy produced by the PV plant.

Battery
- Battery Type. Select REACT2-BATT if at least one battery is present; otherwise select NONE.
- Number. Set the number of REACT2-BATT (battery unit) installed.

Energy Policy
- Energy Policy: set the way to manage the energy produced by the PV plant, choosing from the following:

Management mode	Description
Zero injection	The system automatically manages power flows in order to avoid the injection of energy to the grid. If the meter is discon-nected or not working the inverter's output power is restricted to zero in order to avoid accidental power feeding to the grid.
Self consumption	The system automatically manages power flows in order to maximise self-consumption. All unused power from dome-stic loads will feed into the grid.
Backup only (visible only if "AUTO" or "External Control" option is selected in the "Backup Mode" section)	backup only: the battery has priority over the loads, so it is kept charged until the backup output is activated.
Custom	The system automatically manages power flows in order to avoid feeding the grid with power greater than: PDC x Plim where PDC is the power of the photovoltaic generator ("PV GENERATOR POWER" parameter) and Plim is the output power limit with respect to PDC(%) ("FEED-IN POWER" parameter). - PV Generator Power (Wp): Insert the power value of the photovoltaic system installed. - Feed-in Power (% PV Generator Power): Set the percentage AC power restriction (with reference to the value of the photovoltaic system (kWp) installed) to be feed into the grid.

- Backup Mode:
Set the way to manage the backup funtionality, choosing from:
AUTO. The necessary condition for activating the backup function is the lack of grid.
External Control. The backup function is controlled by an external command.

Confirm the settings by clicking "DONE" and the inverter will test the meter and the battery working and it will reboot at the finish of test phase.

A notification will confirm that the wizard is completed.

✓ **Wizard completed**
Congratulations wizard successfully completed

- After the wizard is completed, the system will power-on. The inverter checks the grid voltage, measures the insulation resistance of the photo-voltaic field with respect to ground and performs other auto-diagnostic checks. During the preliminary checks on the parallel connection with the grid, the "Power" LED keeps flashing, the "Alarm" and "GFI" LEDs are off.
If the outcome of the preliminary checks on the grid parallel is positive, the inverter connects to the grid and starts
to export power to the grid. The "Power" LED remains fixed on while the "Alarm" and "GFI" LEDs are off.

📖 **To address any problems that may occur during the initial stages of operation of the system and to ensure the inverter remains fully functional, you are advised to check for any firmware updates in the download area of the website www.abb.com/solarinverters or at https://registration.abbsolarinverters.com (instructions for registering on the website and updating the firmware are given in this manual).**

Side panel form:
DC Coupled / AC Coupled
Country standard
Select The Country Standard (Grid Code)
-- Please select --
Required
Input mode
PV Input Channels Configuration
Independent
Meter
Meter Model
REACT-MTR-1PH
Battery
Battery Type
None
Energy policy
Energy Policy
-- Please select --
Required
Backup Mode
None
ⓘ The inverter will be rebooted after the country standard change. The procedure may take several minutes.
BACK   DONE

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18. Characteristics and technical data

System components of REACT2 photovoltaic system with storage	REACT2-3.6-TL-OUTD	REACT2-5.0-TL-OUTD
Inverter unit	REACT2-UNO-3.6-TL	REACT2-UNO-5.0-TL
Battery unit	REACT2-BATT	
Energy meter	REACT-MTR-1PH; ABB B21-212; ABB B23-212; ABB B24-212	

Inverter	REACT2-UNO-3.6-TL	REACT2-UNO-5.0-TL
PV port		
Absolute maximum DC input voltage (Vdc, max)	575 V	
Start-up DC input voltage (Vstart)	200 V (adj. 120...350 V)	
Operating DC input voltage range (Vdcmin...Vdcmax)	0.7 x Vstart ...575 V (min 90 V)	
Rated DC input voltage (Vdcr)	390 V	
Rated DC input power (Pdcr)	5000 W	6000 W
Number of Independent MPPT	2	
Maximum DC input power for each MPPT (PMPPTmax)	2500W Linear derating [480 V≤VMPPT≤575 V]	3000W Linear derating [480 V≤VMPPT≤575 V]
DC input voltage range with parallel configuration of MPPT at Pacr, not operative battery	160 V...480 V	195 V...480 V
Maximum DC input current (Idc max) / for each MPPT (IMPPTmax)	24 A / 12 A	27 A / 13.5 A
Maximum input short circuit current for each MPPT (Iscmax)	15 A	
Maximum Return current (AC side vs DC side)	Negligible in normal operating conditions [6]	
Number of DC input connection pairs for each MPPT	2	
DC connection type	Quick-fit PV connector [1]	
PV port protection		
Reverse polarity protection	Yes, from current limited source	
Input overvoltage protection for each MPPT - varistor	Yes	
Photovoltaic array isolation control	According to local standard	
DC switch rating for each MPPT	25 A / 575 V	
Output AC port		
AC grid connection type	Single-phase	
Rated AC power (Pacr @cosφ=1)	3600 W	5000 W [2]
Maximum AC output power (Pacmax @cosφ=1)	3600 W	5000 W [2]
Maximum apparent power (Smax)	3600 VA	5000 VA [2]
Rated AC grid voltage (Vac,r)	230 V	
AC voltage range	180...264 V [3]	
Maximum AC output current (Iac,max)	16 A	22 A
Contributory fault current	16A	22A
Inrush current	Negligible	
Rated output frequency (fr)	50 Hz / 60 Hz	
Output frequency range (fmin...fmax)	45...55 Hz / 55...65 Hz [4]	
Nominal power factor and adjustable range	> 0.995, adj. ± 0.1 - 1 (over/under exited)	
Total current harmonic distortion	<3%	
AC connections type	Panel connector	
Output AC port protection		
Anti-islanding protection	According to local standard	
Maximum external AC overcurrent protection	20 A	25 A
Output overvoltage protection - varistor	2 (L - N / L - PE)	
Backup output port		
AC grid connection type	Single-phase	
Maximum apparent power (Smax)	3000 VA	
Rated AC grid Voltage (Vacr)	230 V	
AC Voltage range	180...264 V [3]	
Maximum AC output current (Iac max)	13 A	
Rated output frequency (fr)	50 Hz / 60 Hz	
Output frequency range (fmin...fmax)	45...55 Hz / 55...65 Hz [4]	
AC connections type	Screw terminal block	
Backup output protection		
Maximum external AC overcurrent protection	16 A	
Output overvoltage protection - varistor	2 (L-N/L-PE)	
Input AC port		
AC voltage range	230 V	
Maximum AC input current (Iac max)	16 A	22 A
Inrush current	Negligible	
Rated output frequency (fr)	50 Hz / 60 Hz	
Battery port		
Operating DC input voltage range (Vdcmin...Vdcmax)	170 V...575 V	
Maximum DC charge current (Idc,max charge)	13.5 A	13.5 A
Rated AC grid Voltage (Vacr)	10 A	10 A
Operating performance		
Maximum efficiency (ηmax)	97.1%	
Weighted efficiency (EURO/CEC)	96.3% / -	96.6% / -
Embedded communication		
Embedded physical interface	Wireless [5], 2 x Ethernet, RS485	
Embedded communication protocols	Modbus TCP (SunSpec), Modbus RTU (Sunspec), ABB-free@home ®	
Datalogger data retention	30 days	
Remote monitoring	Mobile app	
Local monitoring	Web server user interface	

(Continue to next page)

18. Characteristics and technical data (continuation)

EN

Inverter	REACT2-UNO-3.6-TL	REACT2-UNO-5.0-TL
Environmental		
Ambient temperature range	-20...+55°C with derating above 50°C	-20...+55°C with derating above 45°C
Relative humidity	4…100 % condensing	
Acoustic noise emission level	< 50 dB (A) @ 1 m	
Maximum operating altitude without derating	2000 m / 6560 ft	
Environmental pollution degree classification for external environments	3	
Environmental class	Outdoor	
Suitable for wet location	Yes	
Physical		
Environmental protection rating	IP65	
Cooling	Natural	
Dimension (H x W x D)	740 mm x 490 mm x 229 mm	
Weight	< 22 kg	
Mounting system	Wall bracket	
Overvoltage rating as per IEC 62109-1	II (DC input) III (AC output)	
Safety		
Safety class	I	
Insulation level	Transformerless	
Marking	CE	
Safety and EMC Standards	IEC/EN 62109-1, IEC/EN 62109-2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN61000-3-11, EN61000-3-12	
Grid standard (check your sales channel for availability)	CEI 0-21, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G83/2, G59/3, RD 413, AS/NZS 4777.2, C10/11, IEC 61727, IEC 62116	
Other features		
Load manager	Yes, with two integrated relays	
AC backup output, off grid	Yes	
Battery charge from AC	Yes, it can be enabled	
AC-coupled	Yes	

Battery Unit	REACT2-BATT
Modules manufacturer	Samsung
Battery type	Li-Ion
Total energy	4 kWh
Maximum battery voltage (Vdc max)	575 V
Battery voltage range (Vdc operating range)	170...575 V
Maximum DC charge current (Idc max charge)	4.5 A for each battery installed
Maximum DC discharge current (Idc,max discharge)	5.6 A for each battery installed
Deep of discharge (DoD)	95%
N° of battery unit that can be connected to the REACT2-UNO inverter	1, 2, 3
Charge power	1.6 kW, 3.2 kW, 4.8 KW
Discharge power	2 kW, 3.6 kW, 3.6 kW (REACT2-3.6-TL-OUTD) 2 kW, 4 kW, 5 kW (REACT2-5.0-TL-OUTD)
Environmental	
Environmental protection rating	IP54 (suggested indoor installation for preserving battery life time)
Ambient temperature range	-20...+55°C (out of 0...+40°C temperature range, battery will be disabled)
Suggested ambient temperature	+5...+30°C
Storage temperature	-20...+25°C (6 months) or -20...+45°C (3 months)
Relative humidity	4…100 % condensing
Physical	
Cooling	Natural
Dimension (H x W x D)	740 mm x 490 mm x 229 mm
Weight	50 kg
Mounting system	Wall bracket
Safety	
Protective class	I
Marking	CE
Safety	IEC 62619, UN38.3, UN3480

Energy meter	
REACT-MTR-1PH	Single-phase, 20A
ABB B21-212	Single-phase, 65A
ABB B23-212	Three-phase, 65A
ABB B24-212	Three-phase with external CT (opt.)

1) Refer to the document "String inverter – Product Manual appendix" available at www.abb.com/ solarinverters to know the brand and the model of the quick fit connector"

2) For VDE-AR-N 4105 setting, maximum active power of 4600 W and maximum apparent power of 4600 VA

3) The AC voltage range may vary depending on specific country grid standard

4) The Frequency range may vary depending on specific country grid standard

5) As per IEEE 802.11 b/g/n standard

6) In the event of a fault, limited by the external protection envisaged on the AC circuit

Remark. Features not specifically listed in the present data sheet are not included in the product

Further information

For more information on ABB solar products and services, visit www.abb.de/solar

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