EN

Flat solar panels

NEO 2.1 / SUN 211

Installation and Service Manual

Roof-integral Installation
20° to 65°

300021356-001-F

Contents

1 Introduction

1.1 Symbols used

In these instructions, various danger levels are employed to draw the user's attention to particular information. In so doing, we wish to safeguard the user's safety, obviate hazards and guarantee correct operation of the appliance.

DANGER

Risk of a dangerous situation causing serious physical injury.

WARNING

Risk of a dangerous situation causing slight physical injury.

CAUTION

Risk of material damage.

Signals important information.

Signals a referral to other instructions or other pages in the instructions.

Caution: Risk of being burnt.

Zone susceptible to snow.

Zone susceptible to windy conditions.

1.2 General

1.2.1. Manufacturer's liability

Our products are manufactured in compliance with the requirements of the various applicable European Directives. They are therefore delivered with CE marking and all relevant documentation.

In the interest of customers, we are continuously endeavouring to make improvements in product quality. All the specifications stated in this document are therefore subject to change without notice.

Our liability as the manufacturer may not be invoked in the following cases:

- Failure to abide by the instructions on using the appliance.
- Faulty or insufficient maintenance of the appliance.
- Failure to abide by the instructions on installing the appliance.

1.2.2. Installer's liability

The installer is responsible for the installation and inital start up of the appliance. The installer must respect the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Carry out installation in compliance with the prevailing legislation and standards.
- Perform the initial start up and carry out any checks necessary.
- Explain the installation to the user.
- If a maintenance is necessary, warn the user of the obligation to check the appliance and maintain it in good working order.
- Give all the instruction manuals to the user.

1.2.3. User's liability

To guarantee optimum operation of the appliance, the user must respect the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Call on qualified professionals to carry out installation and initial start up.
- Get your fitter to explain your installation to you.
- To carry out inspections and maintenance required by a qualified professional.
- Keep the instruction manuals in good condition close to the appliance.

This appliance is not intended to be used by persons (including children) whose physcial, sensory or mental capacity is impaired or persons with no experience or knowledge, unless they have the benefit, through the intermediary of a person responsible for their safety, of supervision or prior instructions regarding use of the appliance. Care should be taken to ensure that children do not play with the appliance.

2 Safety instructions and recommendations

2.1 Safety instructions

DANGER

The permissible roof load of the building must not at any time be exceeded. If necessary, a structural engineer should be consulted before commencing work.

WARNING

Only a qualified professional may carry out the installation in conformity with in force legislation and standards.

CAUTION

Do not neglect to service the appliance. Contact a qualified professional or take out a maintenance contract for the annual servicing of the appliance.

2.2 Recommendations

WARNING

- Any operation on the installation must be performed by a qualified technician respecting professional regulations and in accordance with this document.
- When making the connections, it is imperative that the standards and corresponding local directives are respected.

- The flat solar panels and fittings should be handled carefully during transportation and storage. If the packing has nevertheless been damaged during transit, the damage must be reported immediately to and claimed against the carrier.
- The contents of the assembly kit must be checked before installation against the list which accompnaies each kit.
- When installing the panels, take note of the safety instructions in this document.
- The packing material should be properly disposed of after installation.
- Insulate the pipes in rooms that are not heated (cellars and lofts).
- Check regularly that the installation contains water and is pressurised.
- Service the appliance regularly to ensure that it operates correctly.

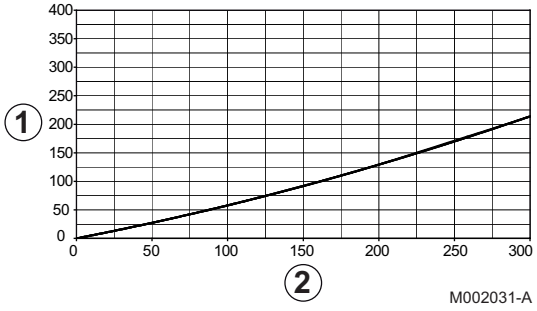
3 Description

3.1 Operating principle

The short-wave solar radiation (sunlight) striking the solar panel is converted into heat by the selective coating on the absorber. From there it is transferred by heat conduction to the absorber pipe and carried by the heat-transporting fluid to the calorifier. The solar-panel fluid heats the calorifier by means of the energy absorbed from the sun and cools down itself in the process. The cooled heat-transporting fluid then flows back to the solar panel in order to collect more solar energy. An intelligent control system ensures that the circulation system is only active when there is sufficient solar radiation, thus optimising the collection of solar energy.

3.2 Technical specifications

Length	mm	1960
Width	mm	1060
Height	mm	70
Weight	kg	34.45
Gross collector area A_G	m^2	2,1
Inlet surface Aa	m^2	1,88
Absorber surface A_A	m^2	1,90
Water content	litres	1,2
Maximum operating pressure	bar	10
Testing pressure	bar	15
Optical efficiency η_o		0,773
Loss rating a_1	$W/m^2.K$	3,676
Loss rating a_2	$W/m^2.K$	0,0143
Stagnation temperature	°C	180
Hydraulic connections	mm	12
Pressure drop	mbar	See below
Fitted tilt angle minimum/maximum	°	20 to 65



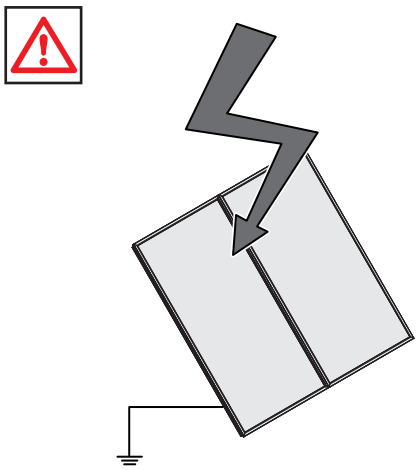
Load loss curve

① Pressure drop (mbar)

② Mass flow (Kg/h)

4 Installation

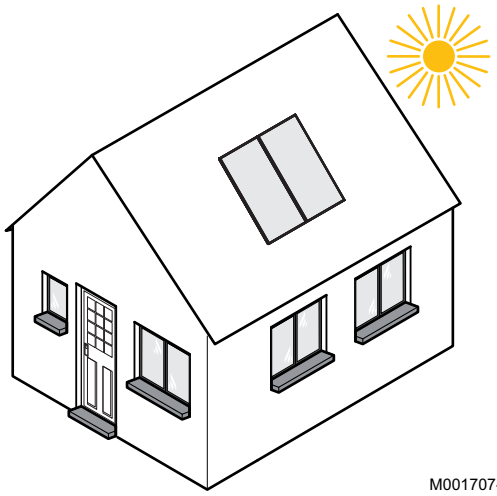
4.1 Regulations governing installation



M001788-A

CAUTION

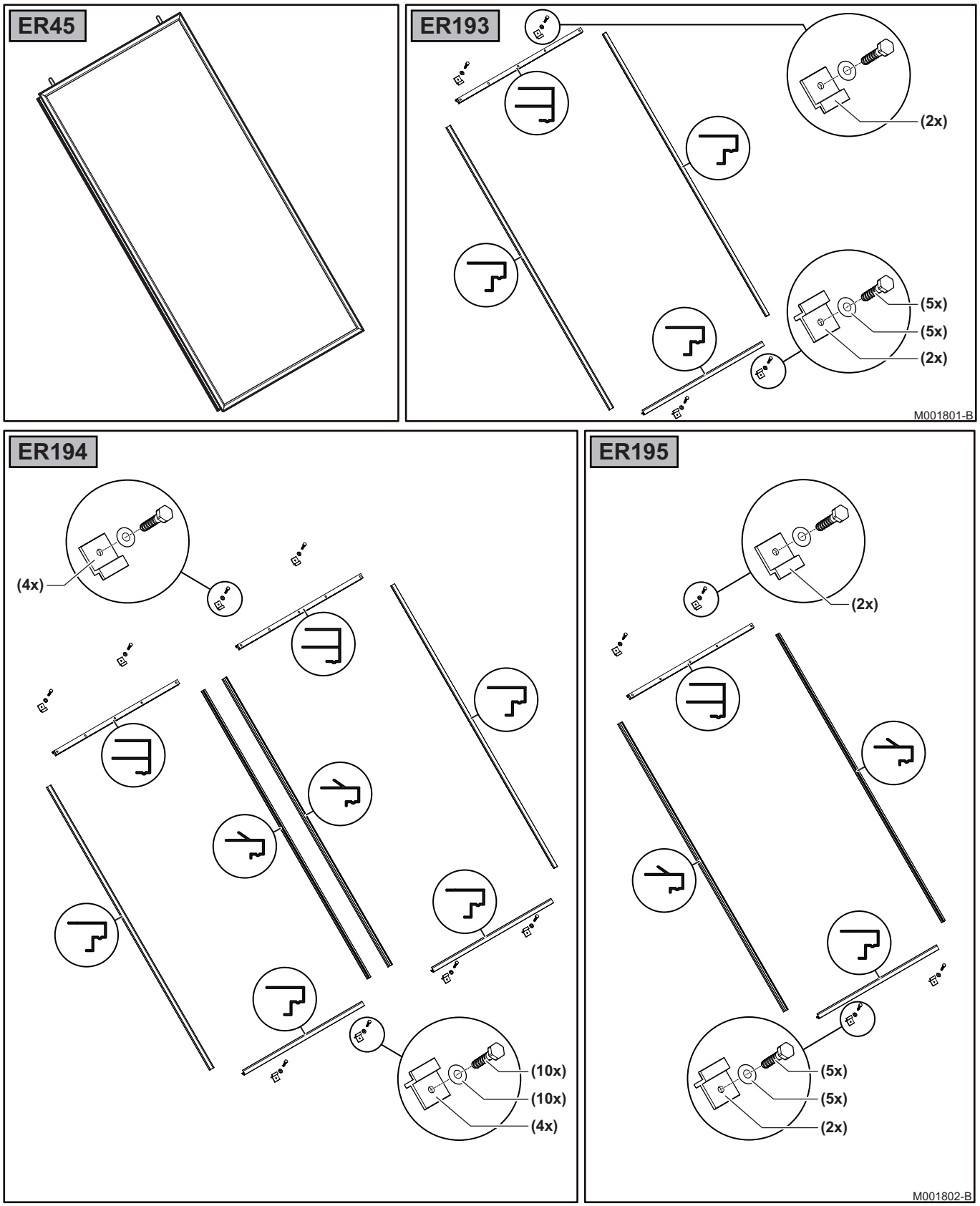
- The installation must comply in all matters to the standards and rules which govern the work and interventions in individual and collective homes, and other constructions.
- The installation and maintenance of the appliance must be carried out by a qualified professional in compliance with the statutory texts of the codes of conduct in force.
- Before installation, make sure that the framework is solid and strong enough to comply with the static requirements.
- Solar installations must be earthed to protect them against lightning.
- Protection of the environment: Place a container of sufficient volume under the drain pipe and the valve discharge pipe.

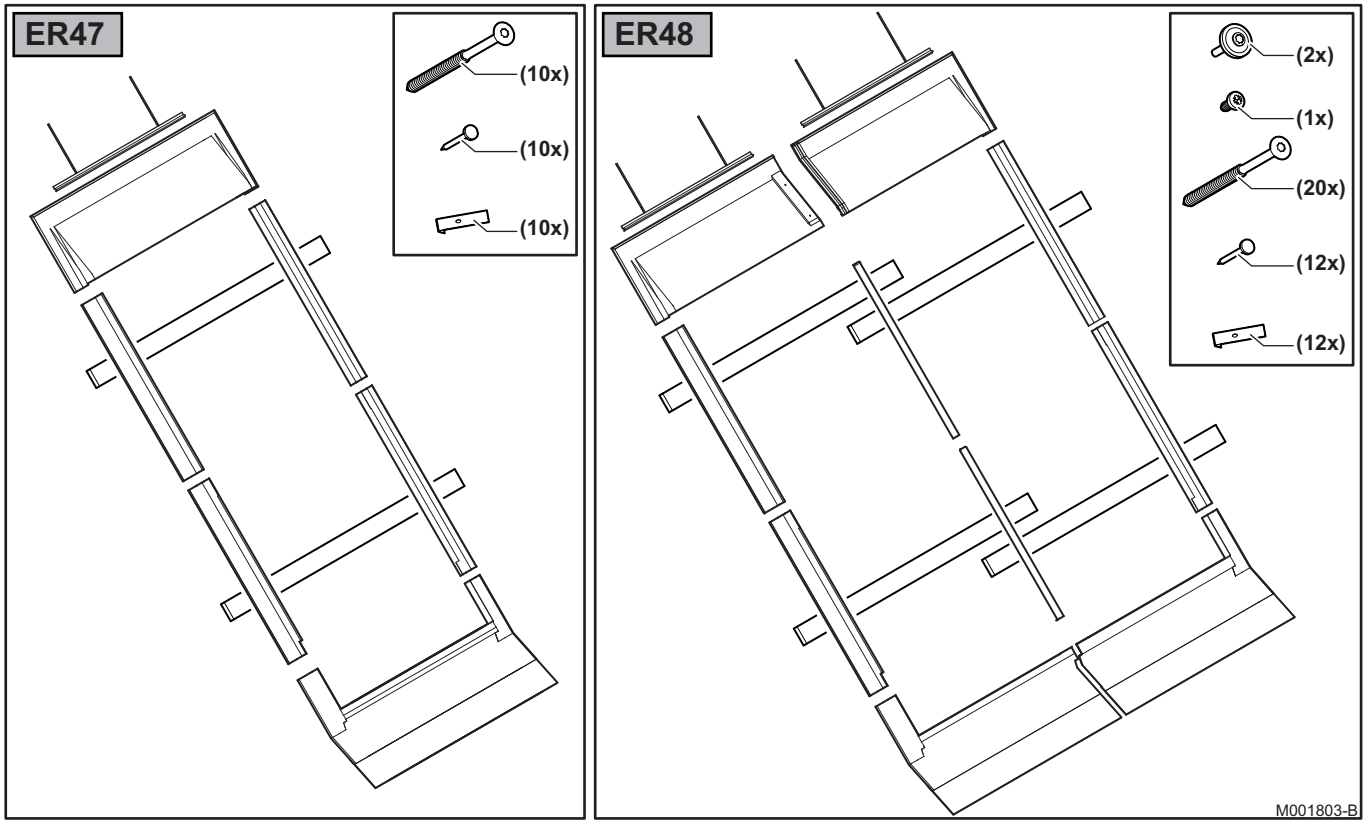


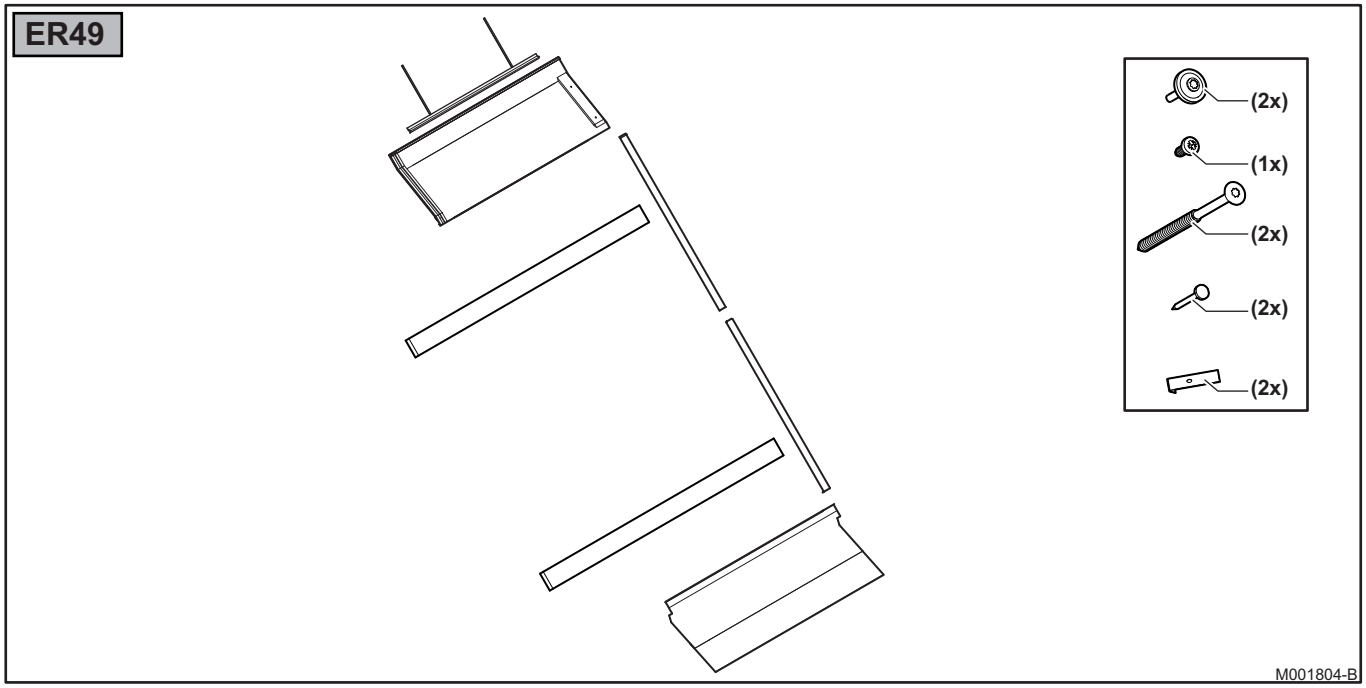
M001707-A

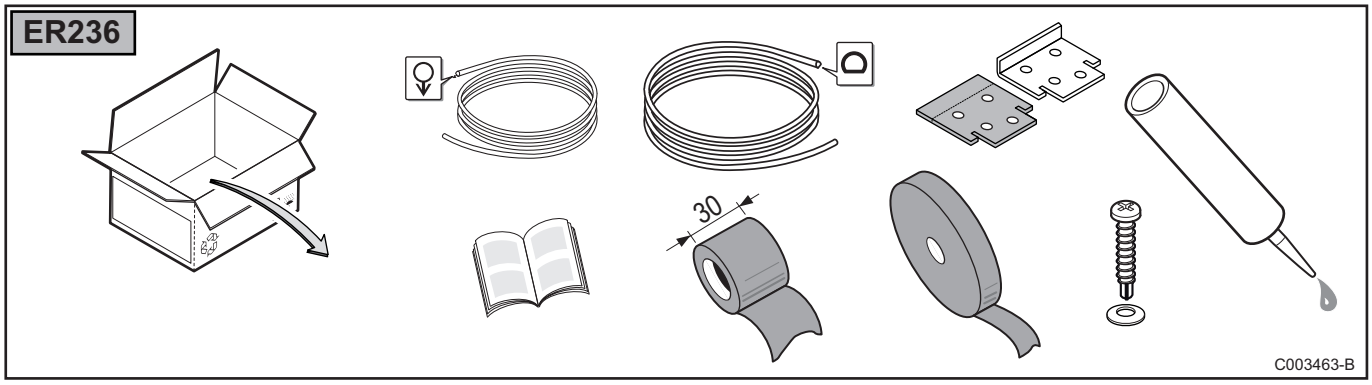
- The roof-integral installation set is designed specifically as a mounting system for the NEO 2.1 / SUN 211 flat solar panels and may only be used in accordance with their building regulations approval.
- The installation set is designed for rooves with standard roof tiles (Flat tile,mechanical tiles). If using particularly large tiles (canal tiles, Roman tiles), consult a technical adviser.
- The roof mounting kit is used to install solar collectors on roofs with a minimum gradient of 20° protected by plastic (protective tarpaulin).
- The water drainage channels on the membrane should run into the eaves (roof gutter).
- The installation should therefore not be flushed or filled when the collectors are hot (in strong sunshine).
- The solar system must at all times be filled with heat transporting fluid:Tyfocor L or LS.

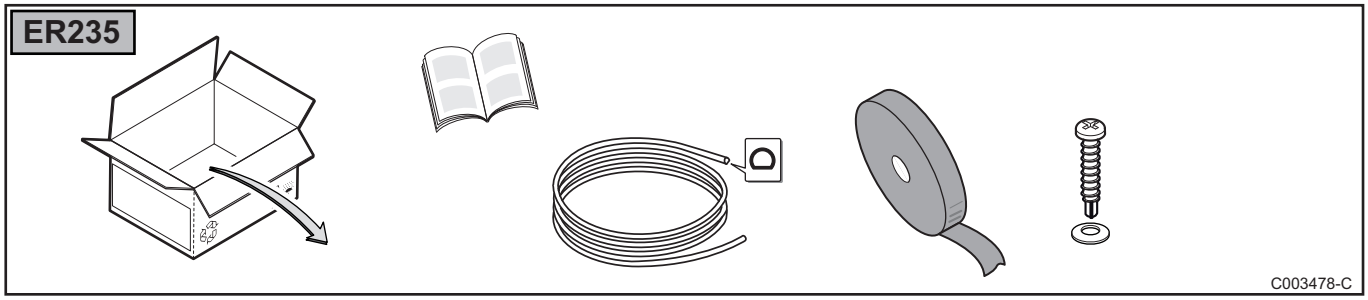
4.2 Package list

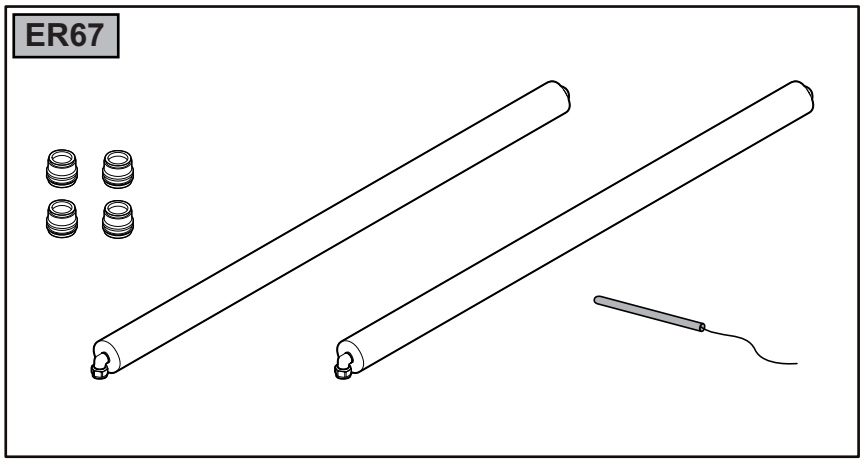


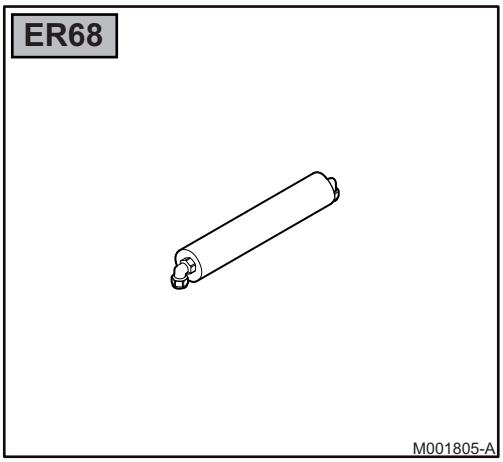

ER47
(10x)
(10x)
(10x)
ER48
(2x)
(1x)
(20x)
(12x)
(12x)
M001803-B


ER49
(2x)
(1x)
(2x)
(2x)
(2x)
M001804-B


ER236
30
C003463-B

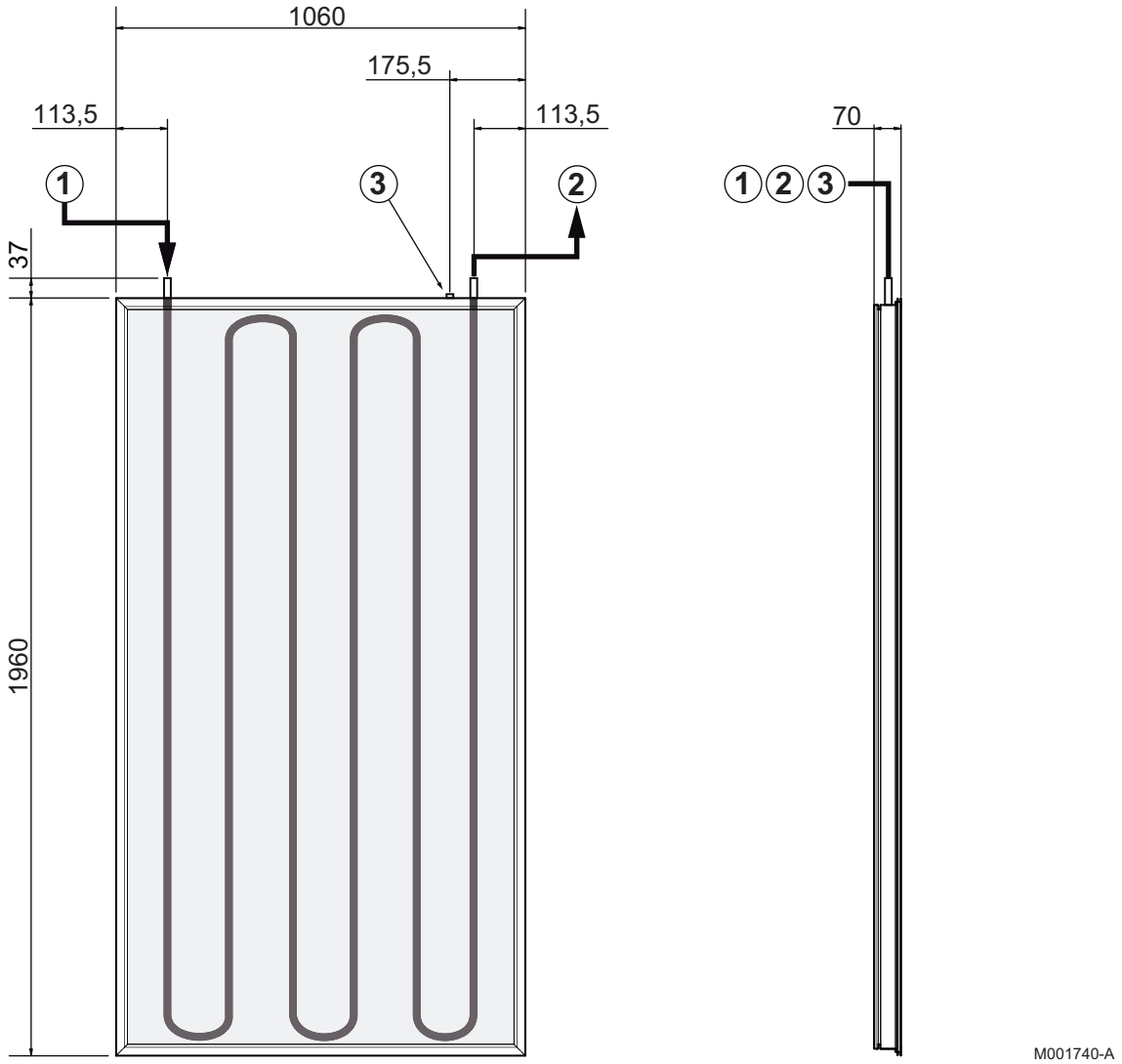






Pack no.	Article no.	Description	Packages needed to construct the installation depending on the number of solar collectors				
			1	2	3	4	5
ER 45	100013471	Solar collector	1	2	3	4	5
ER 193	100017965	Mounting kit 1 panel	1				
ER 194	100017966	Mounting kit for 2 collectors		1	1	1	1
ER 195	100017967	Mounting kit for extension			1	2	3
ER 47	100013473	Sheet metal plate kit for 1 collector	1				
ER 48	100013474	Sheet metal plate kit for 2 collectors		1	1	1	1
ER 49	100013476	Sheet metal plate kit for extension			1	2	3
ER 235	100017997	Waterproofing kit for integration of 1 collectors	1				
ER 236	100017998	Waterproofing kit for integration of 2 collectors		1	2	3	4
ER 67	100013503	Hydraulic connection kit	1	1	1	1	1
ER 68	100013504	Hydraulic connection kit: Bridge 180° DN12 230 mm		1	2	3	4

4.3 Main dimensions



① Solar collector inlet
② Solar collector outlet
③ Solar sensor probe

4.4 Installation diagrams

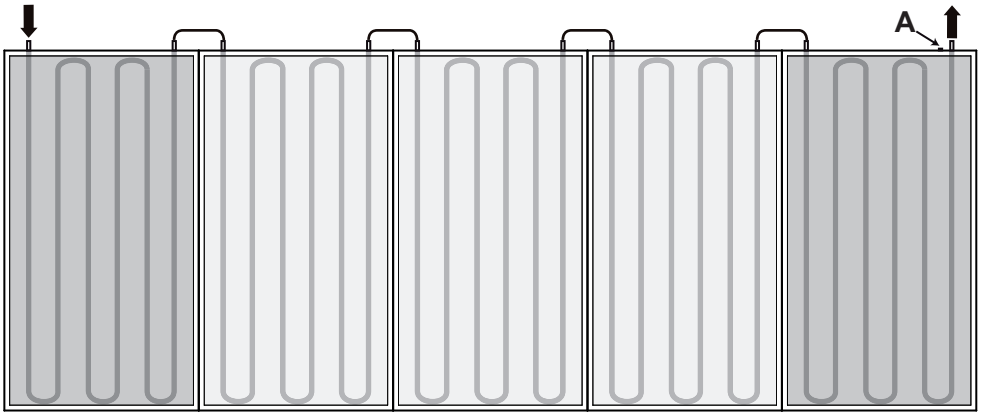
4.4.1. Vertical assembly, juxtaposed

Connection for 1 to 5 collectors.

CAUTION

Place the collector sensor on the flow side of the solar circuit (flow from the hottest collector).

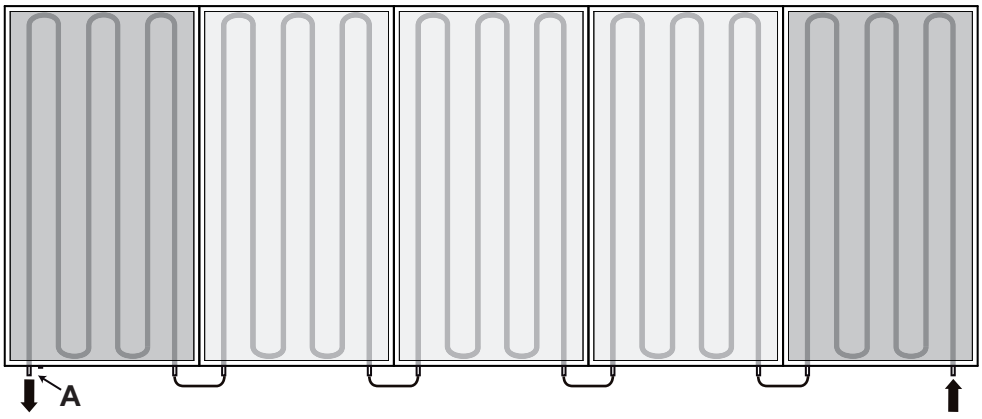
A: Solar sensor probe.



M001754-B

CAUTION

Recommended mounting: Sensor **A** located at the top of the collector.

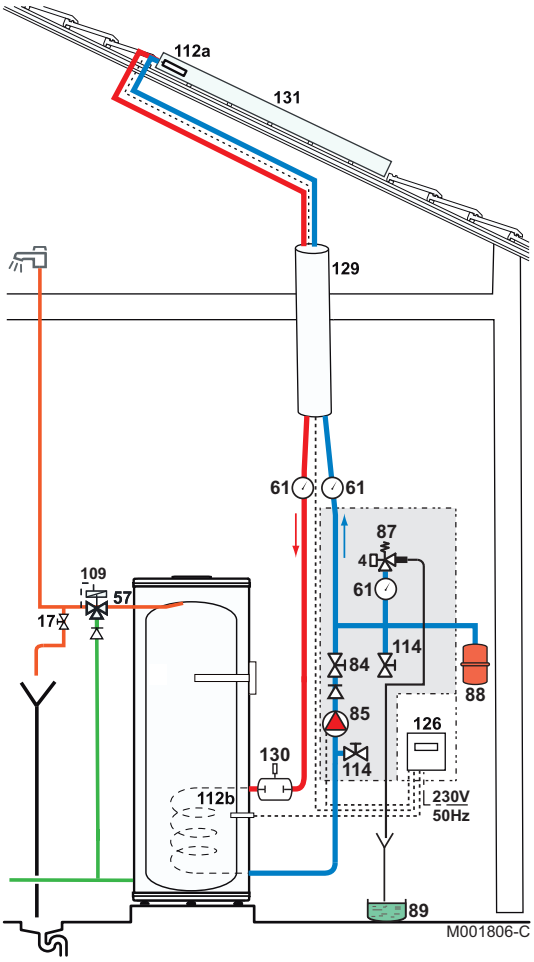


M001775-B

CAUTION

If sensor **A** is located at the bottom of the collector, it is necessary to use a batten from your delivery of a max. height of 45 mm (see chapter: "Dimensions", page 18).

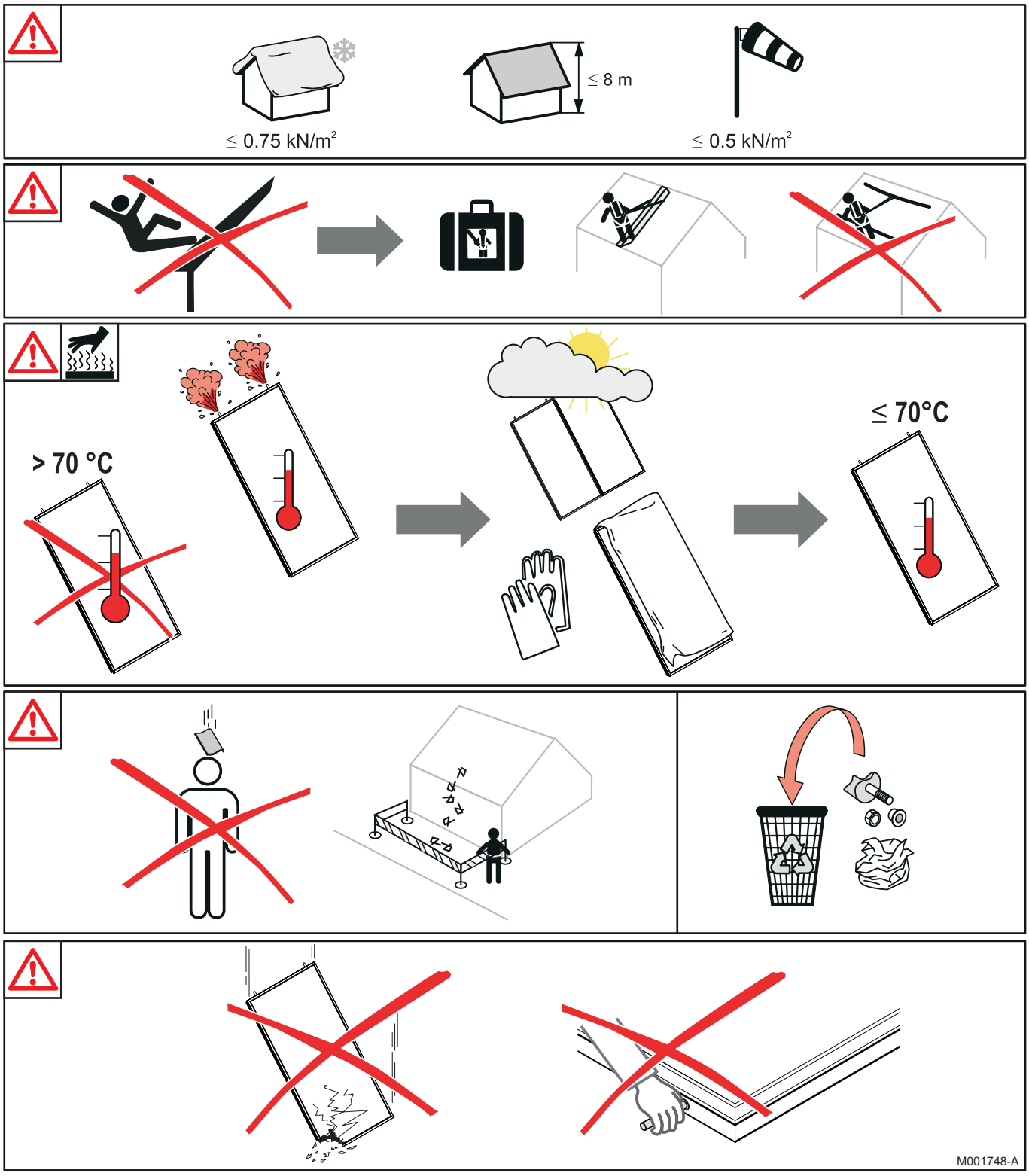
4.4.2. Example of an installation



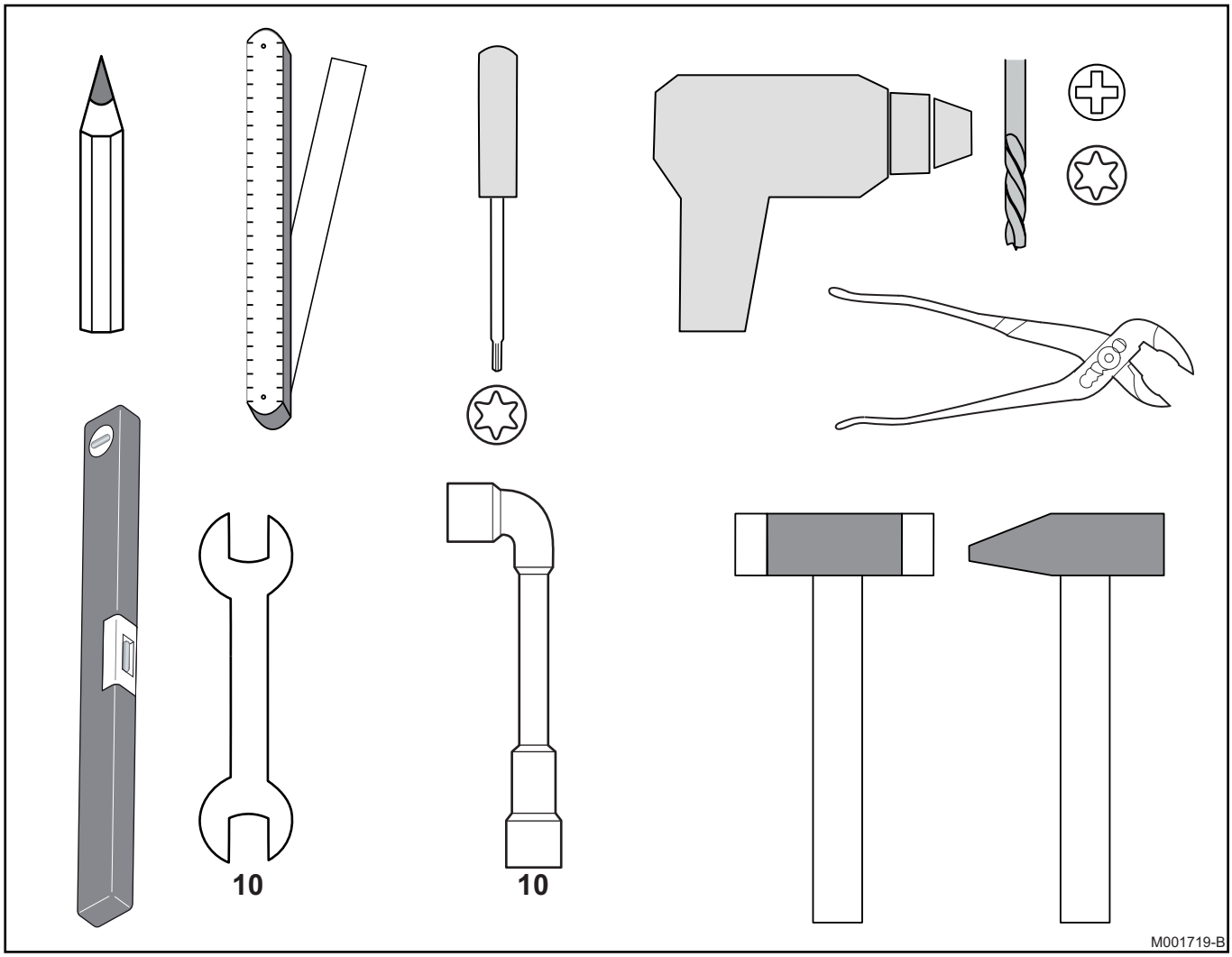
4	Pressure gauge
9	Isolating valve
17	Drain cock
57	Domestic hot water outlet
61	Thermometer
84	Stop valve with lockable nonreturn valve
85	Primary solar circuit pump
87	6-bar calibrated and sealed safety valve (primary solar)
88	Expansion vessel
89	Heat transfer fluid container
109	Domestic hot water thermostatic mixing valve
112a	Solar sensor probe
112b	Domestic hot water sensor
114	Solar circuit drainage valve
126	Solar regulator
129	Duo-Tube
130	Manual bleed degasser
131	Flat or tubular solar panel

4.5 Assembling the solar collectors

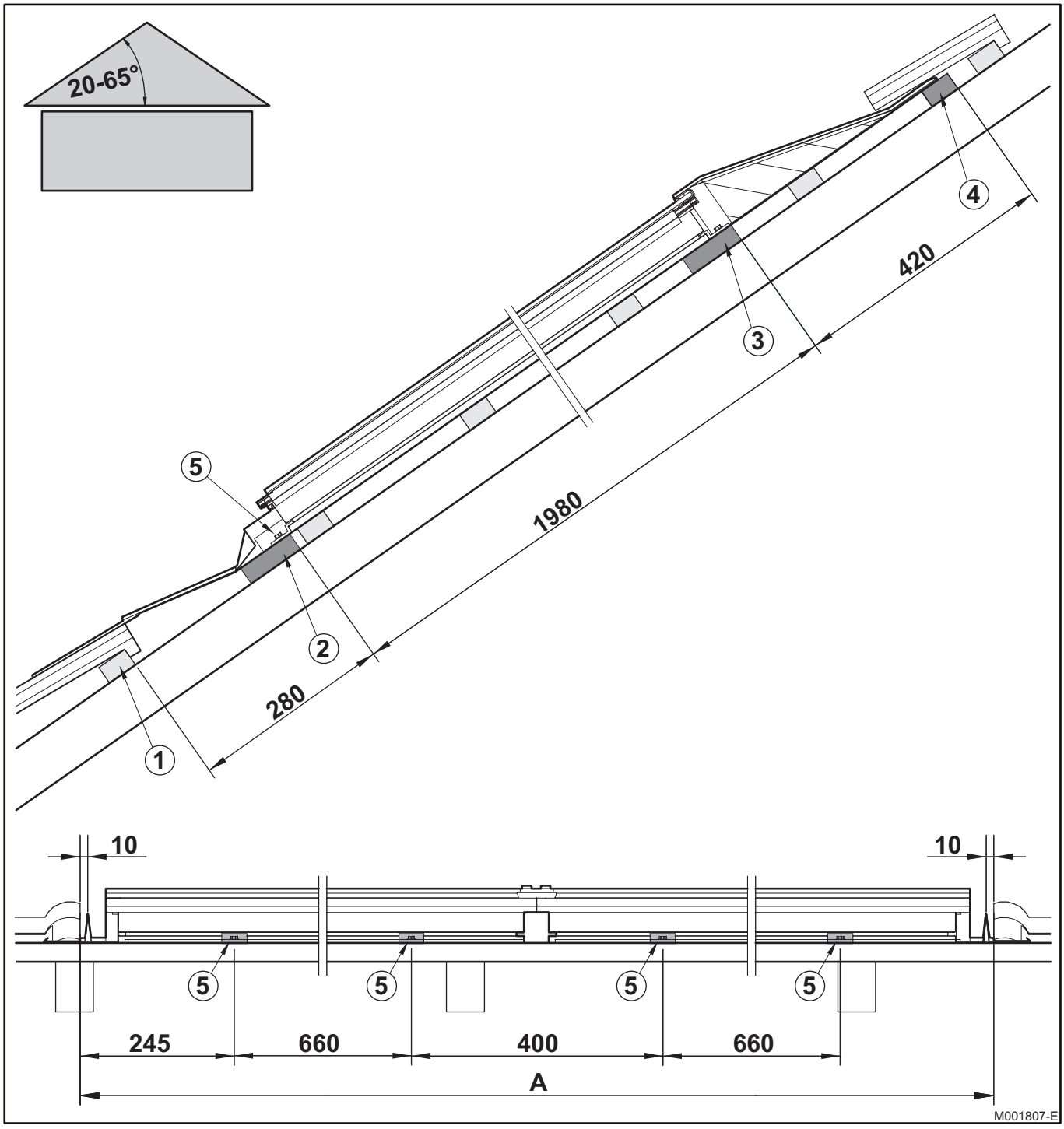
4.5.1. Warning



4.5.2. Tools required



4.5.3. Dimensions



① Existing batten

② Flow batten to be fitted width 90 mm supplied

③ Fastening batten to be fitted supplied

④ Fastening batten to be fitted not supplied

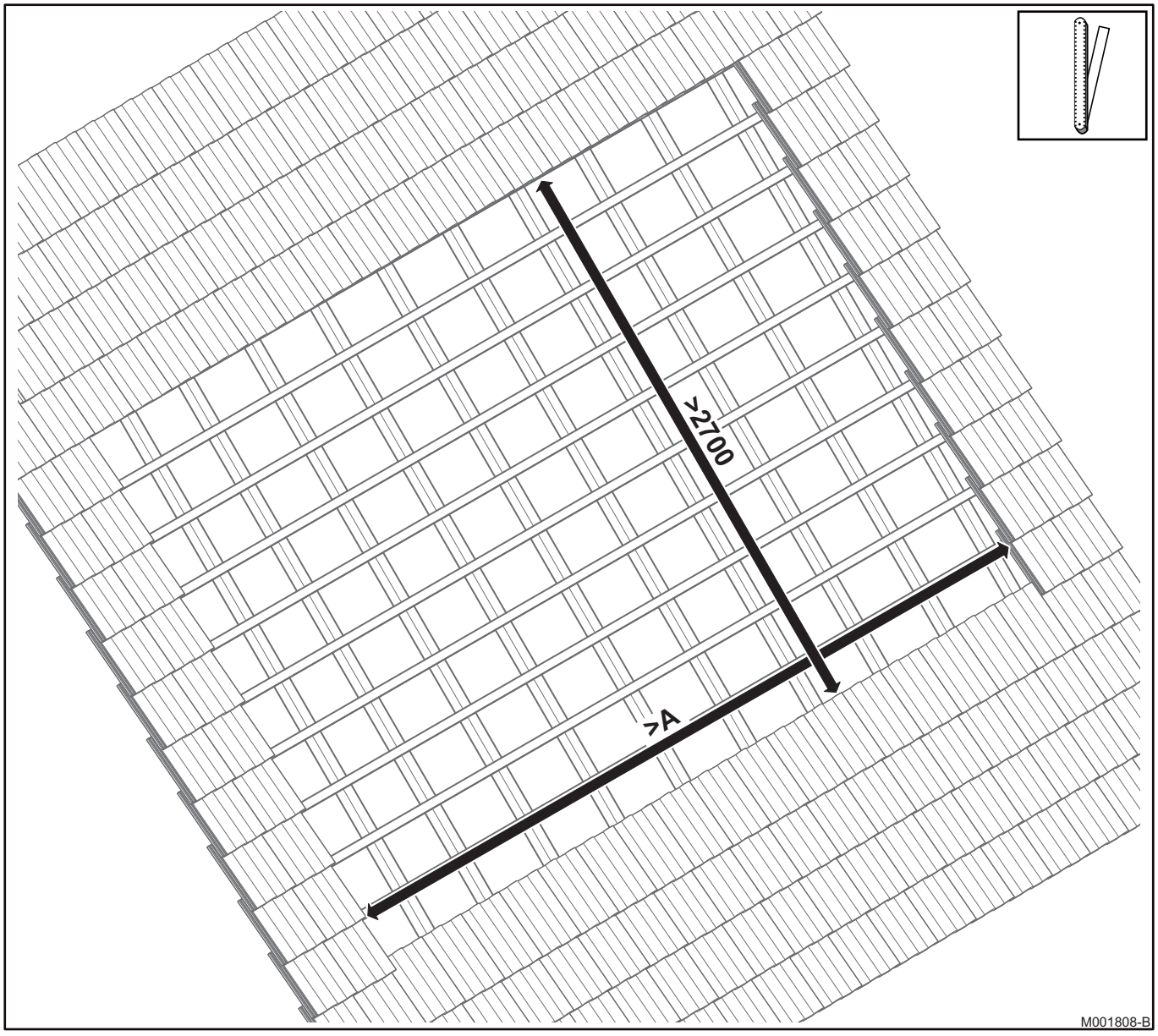
⑤ Fastening lugs to be fitted to the batten marked ②

Number of panels	1	2	3	4	5
Size **A**	1147	2210	3273	4336	5400

CAUTION

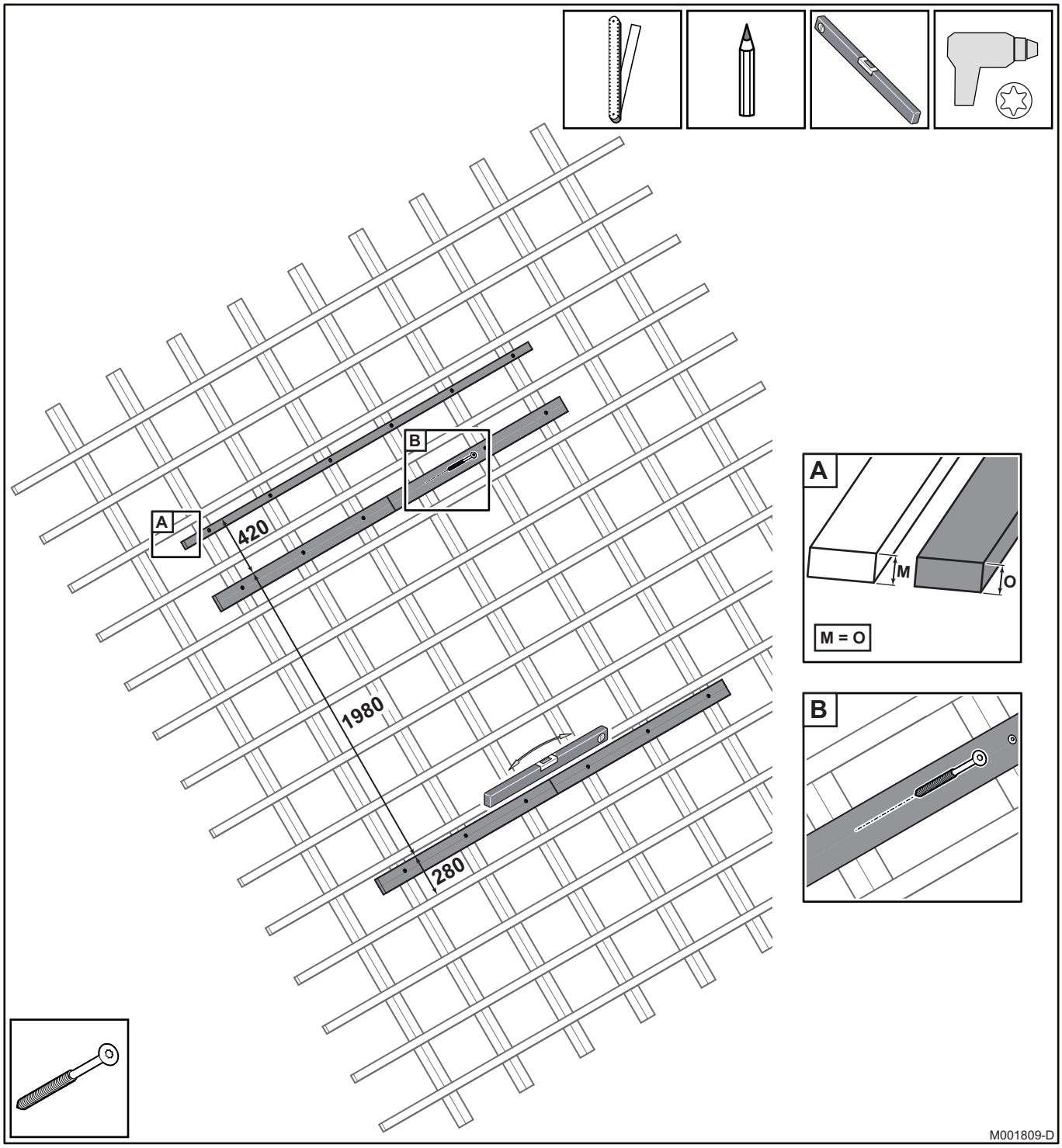
Battens ②, ③ and ④ must be of the same thickness as the existing battens.

4.5.4. Clearance to allow for



Number of panels	1	2	3	4	5
Size **A**	1600	2660	3730	4790	5850

4.5.5. Fitting the battens

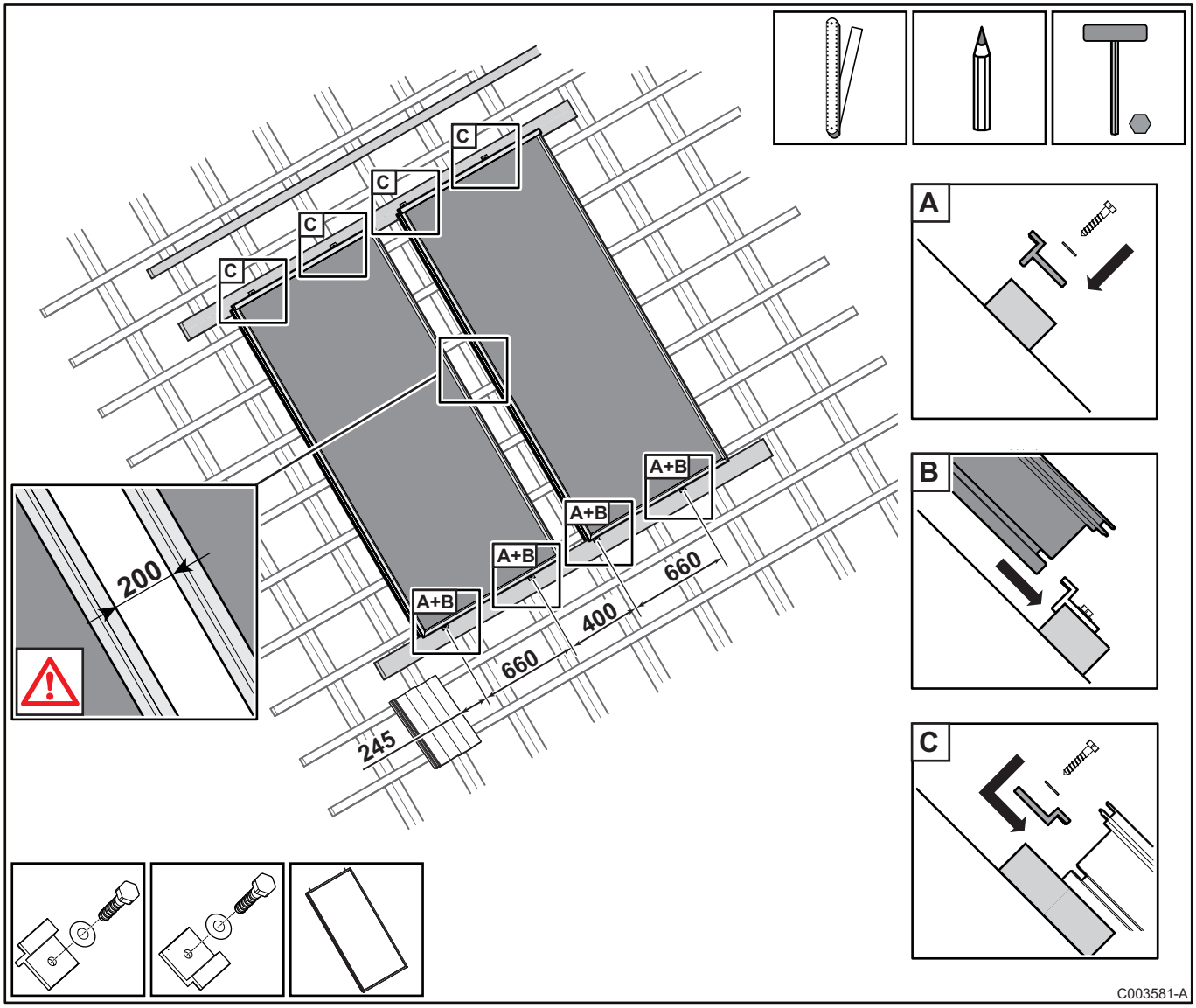


A The new fastening battens must be of the same thickness as the roof battens.

B Secure the battens using the screws provided.

4.5.6. Mounting for an installation with 2 collectors

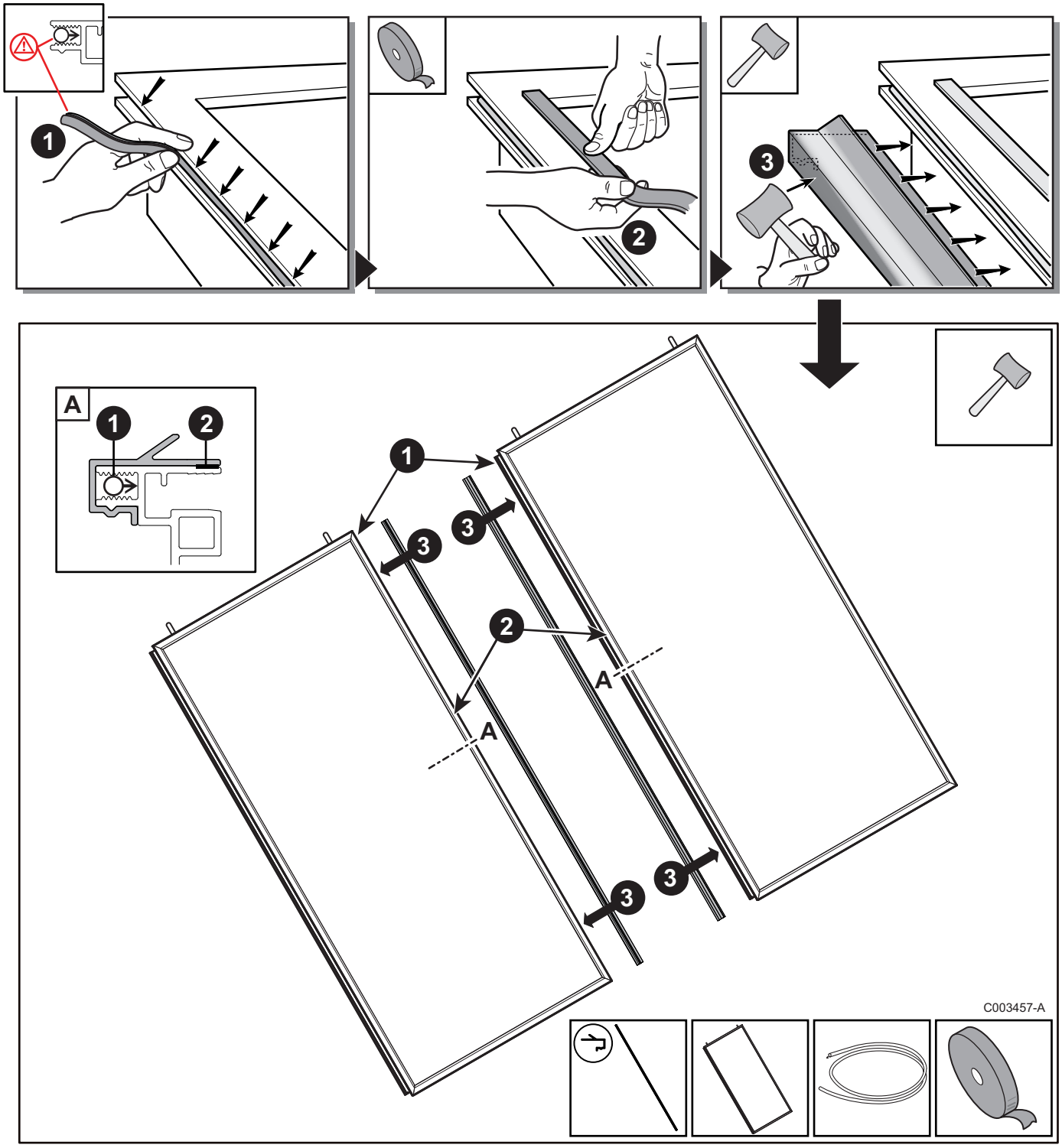
■ Positioning the solar collectors



A	Screw the lower fastening lugs onto the bottom batten.
B	Position the collectors. The fastening lugs must be fitted into the holding groove.
C	Postion the upper fastening lugs in the holding groove on the collectors and screw them onto the batten.

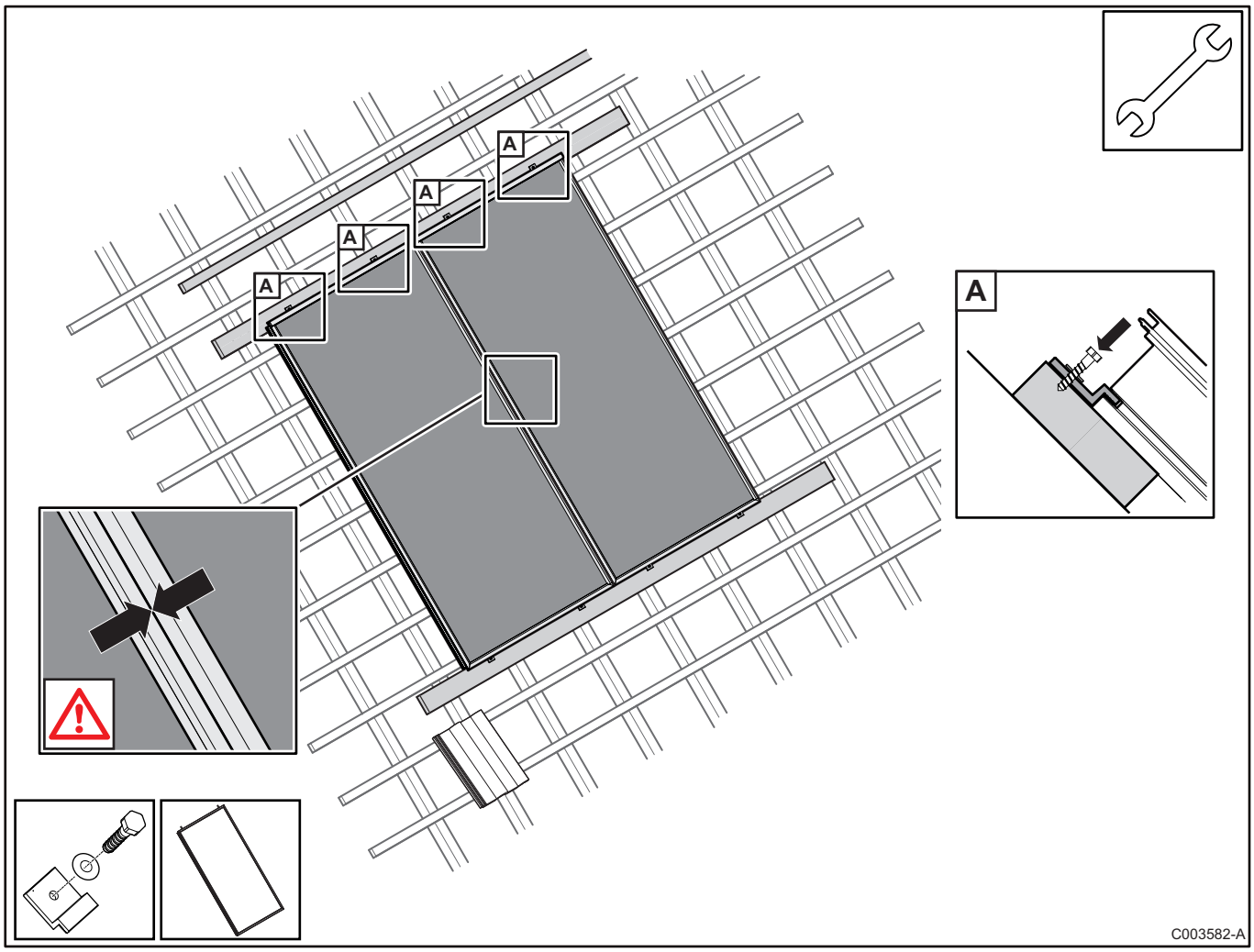
The solar panels should only be installed shortly before the solar-heating system is to be commissioned. This will minimise the time that the solar panels are exposed to heat while not filled with heat-transporting fluid.

■ Fitting the intermediary seals and clips



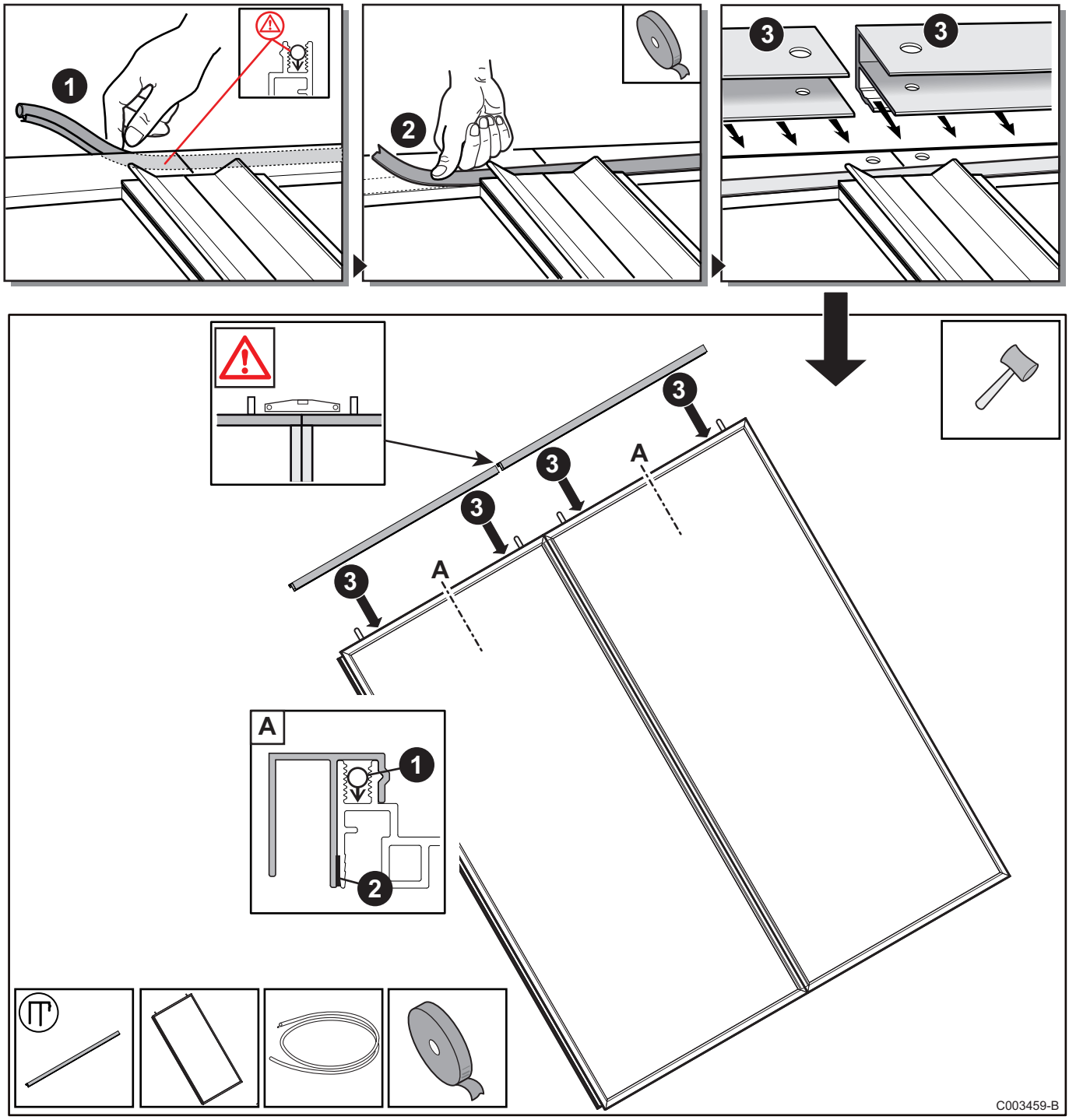
1. Fit the seal, without the clamp, into the groove along the entire height of the 2 collectors.
2. Glue the intermediary flat seal to the 2 collectors.
3. Fit the intermediary clips using the mallet, aligning them with the bottom of the collectors.

■ Assembling and securing the 2 collectors



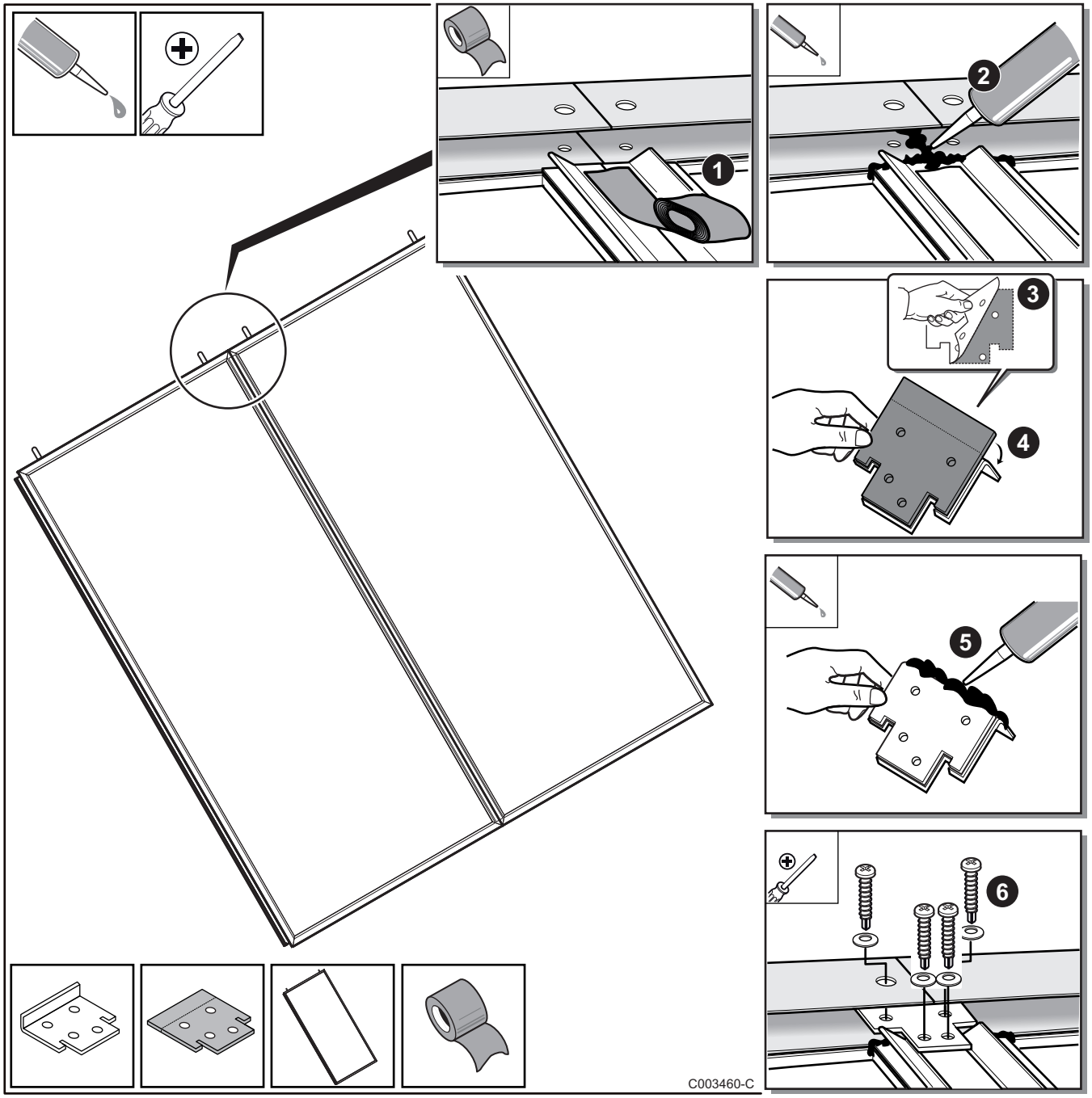
A Fit the second collector alongside the first and secure them.

■ Fitting the upper seals and clips



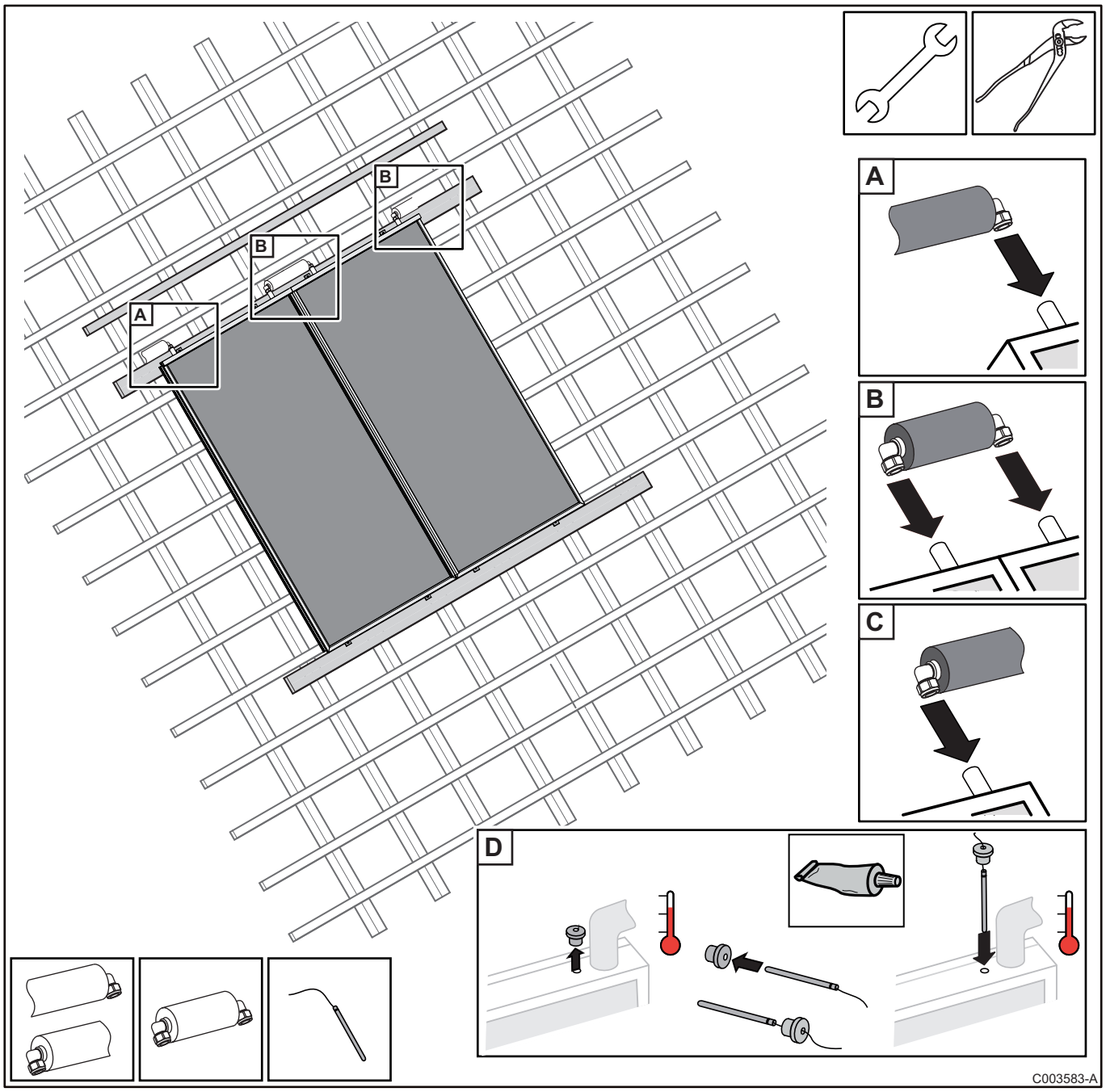
1. Fit the seal, without the clamp, into the upper groove on the 2 collectors.
2. Glue the flat seal along the entire width of the 2 collectors.
3. Fit the upper clips using the mallet.

■ Waterproofing the connection between the 2 collectors



1. Glue the BUTYL strip to the intermediary clips, leaving 3 mm clearance.
2. Squeeze silicone on to the joints between the mounting components.
3. Remove the protective film from the self-adhesive foam.
4. Glue the self-adhesive foam to the covering plate.
5. Cover the upper part of the covering plate with silicone.
6. Fit the covering plate, secure it and spread a veil of silicone over it.

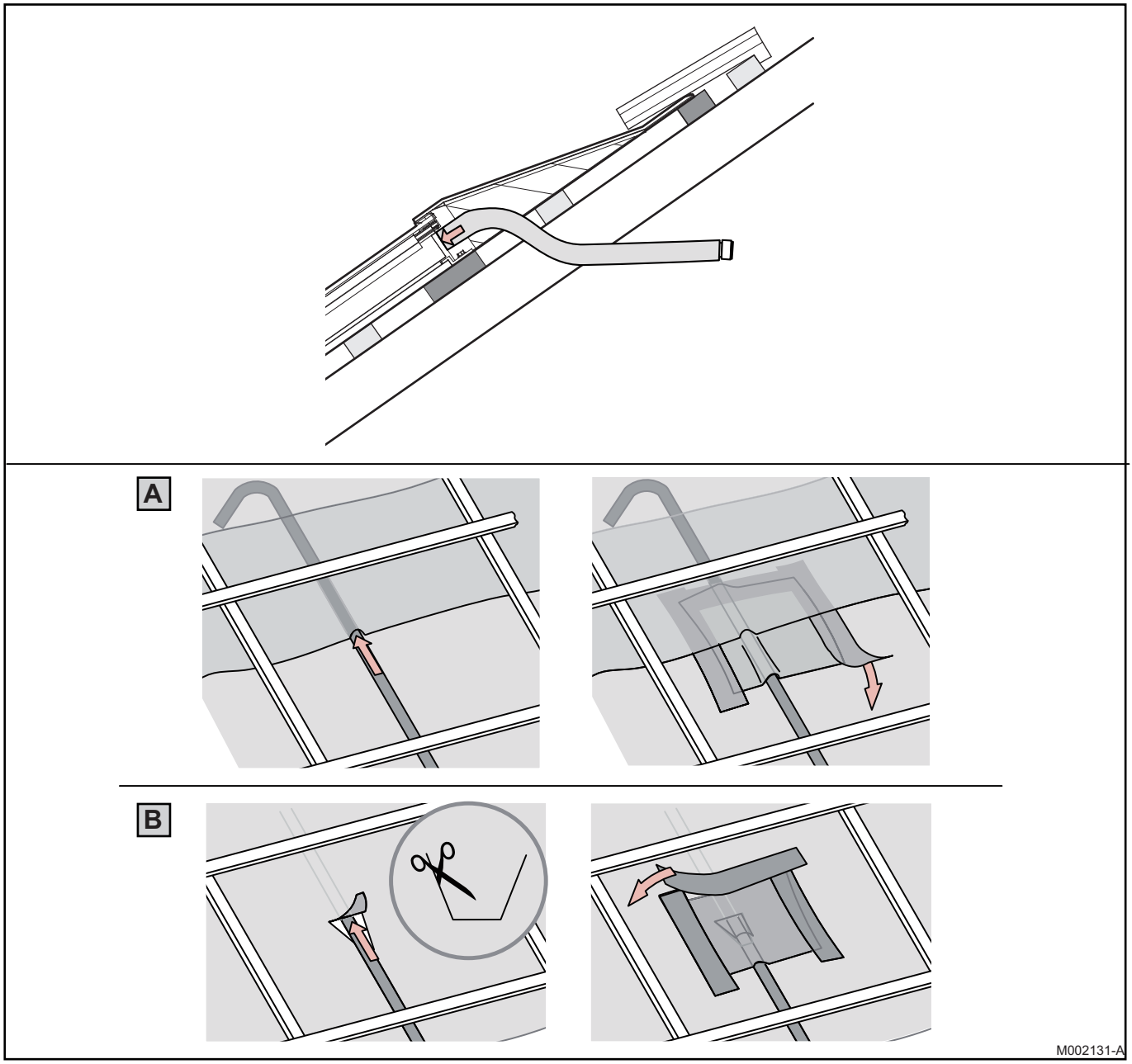
■ Connecting the solar collectors



CAUTION

Install the temperature sensor in the sensor tube on the solar collector, at the flow end of the bank of collectors. The transfer of heat between the sensor socket and the temperature sensor can be improved by the use of heat-conducting paste.

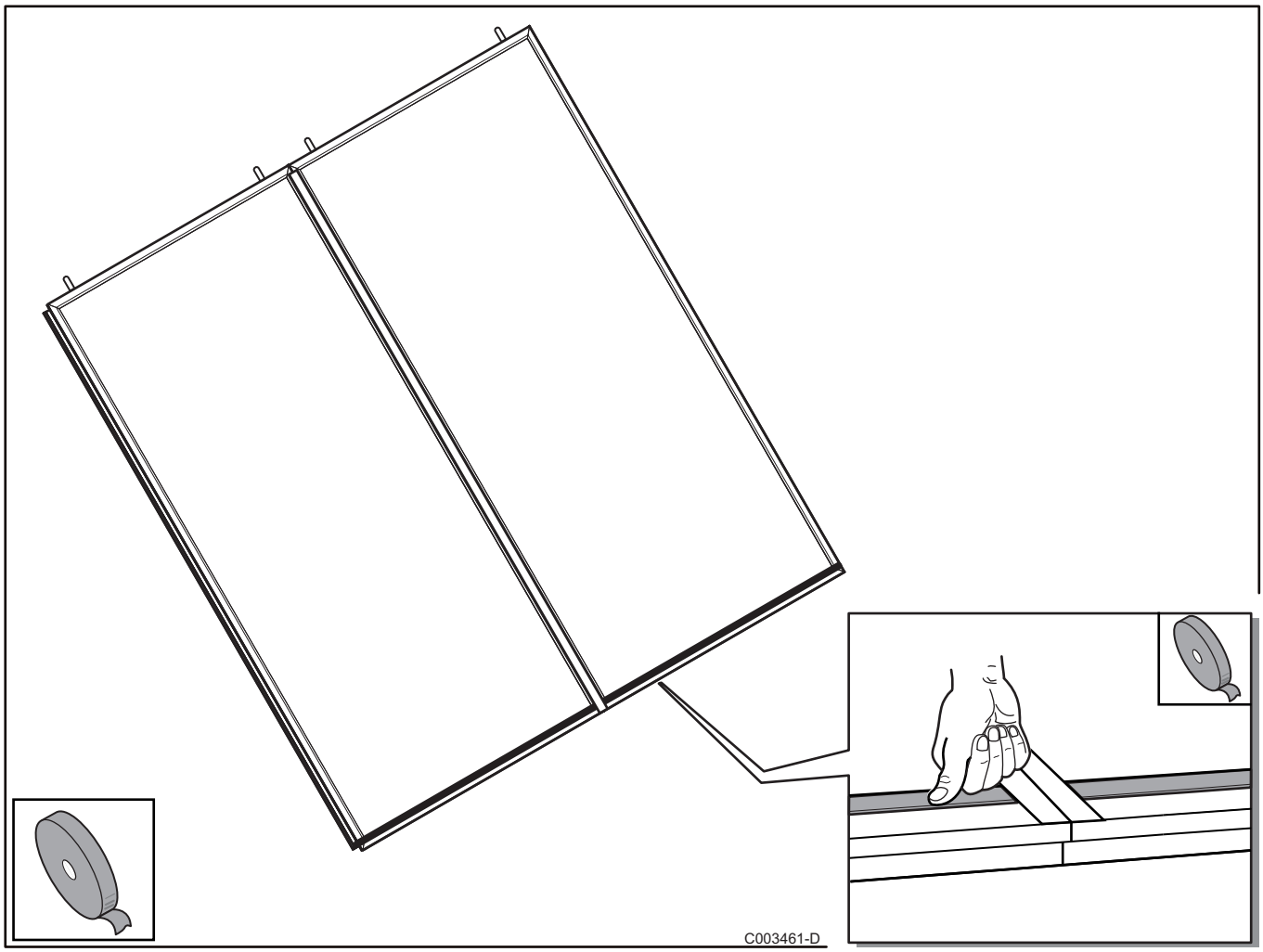
■ Passing Pipes and Cable through the Roof



A Scenario with two overlapping sheets of film under the roof

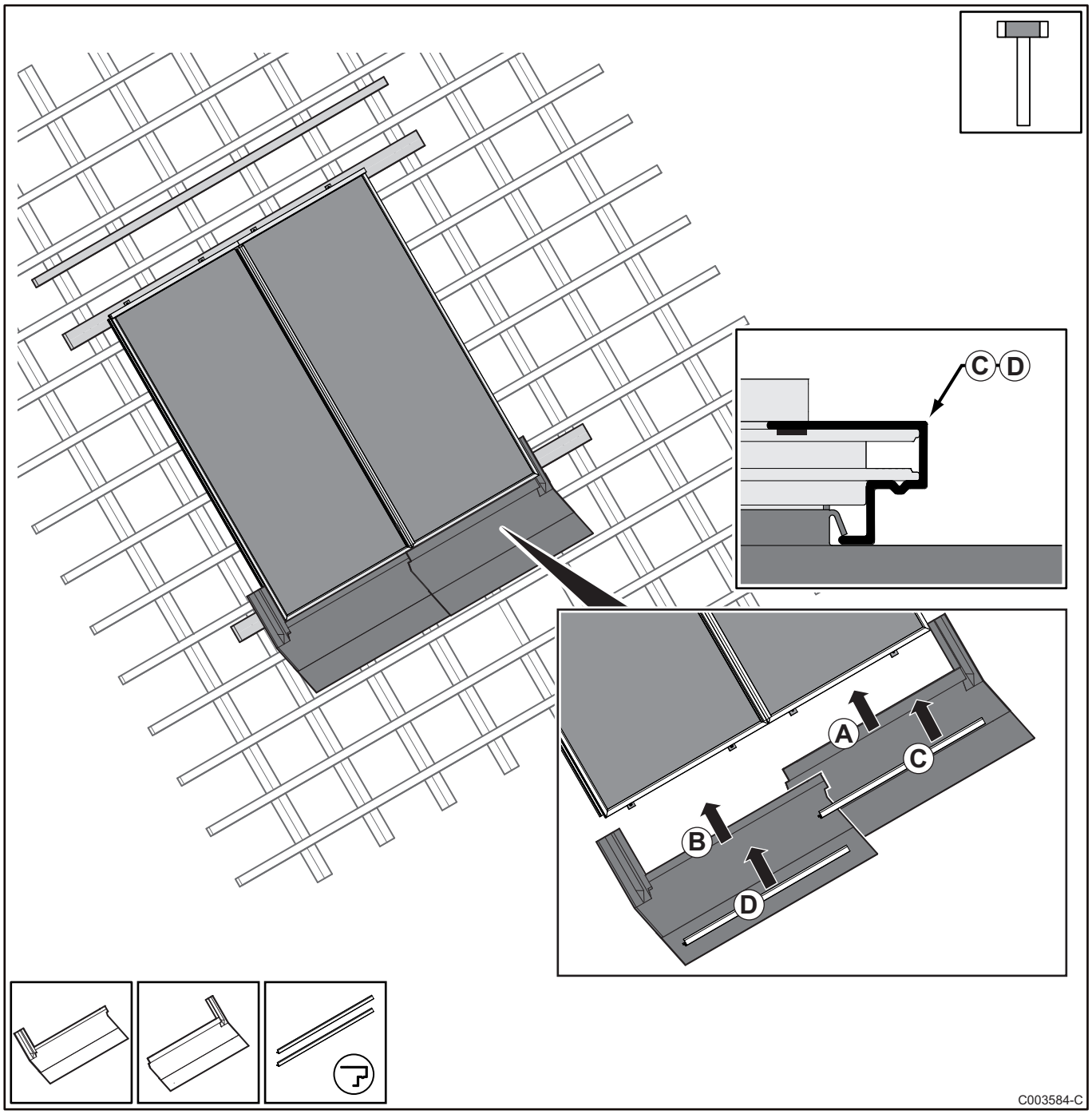
B Scenario with a single sheet of film under the roof

■ Fitting the lower flat seal



Fit the flat seal along the lower part of the 2 collectors.

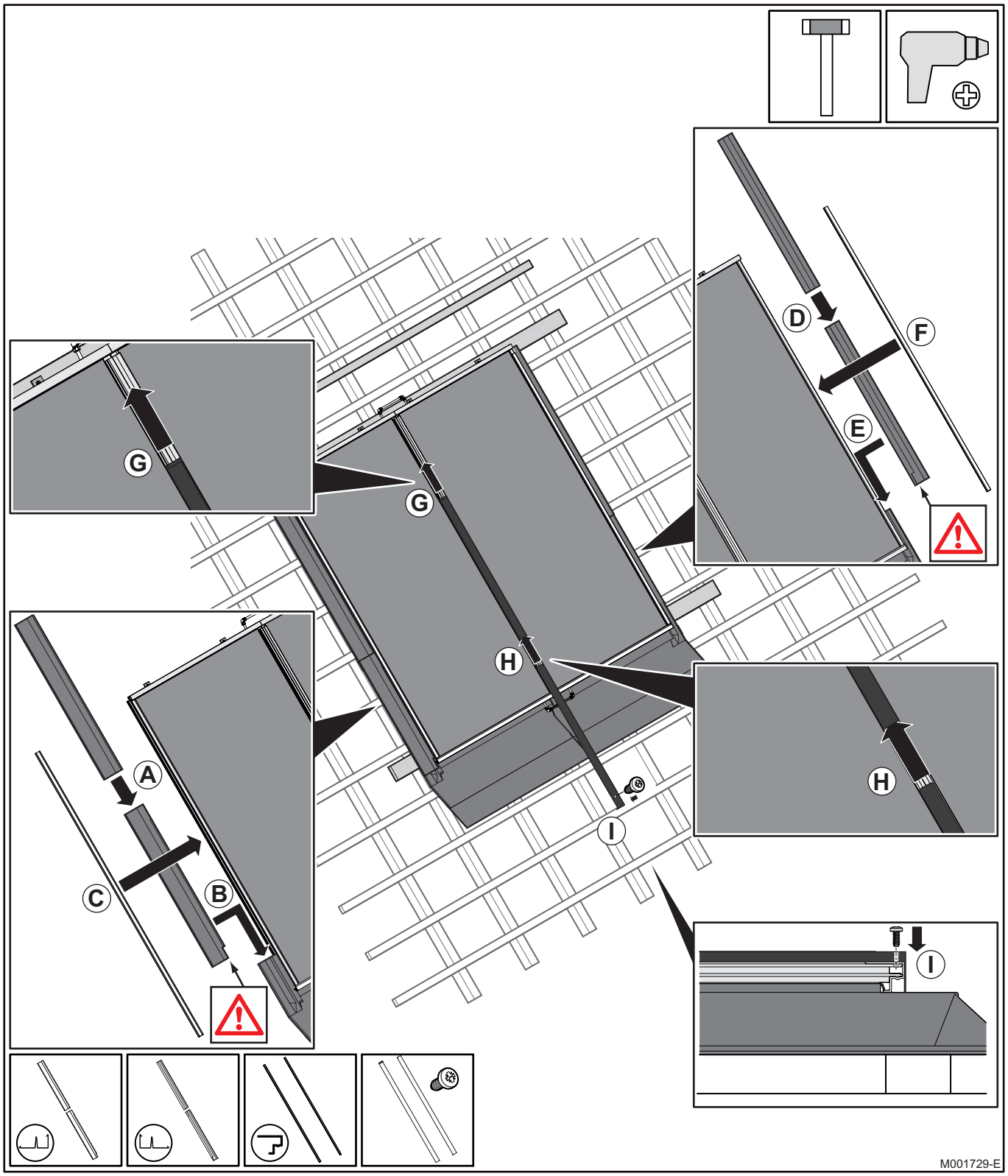
■ Mounting the lower roofing plates



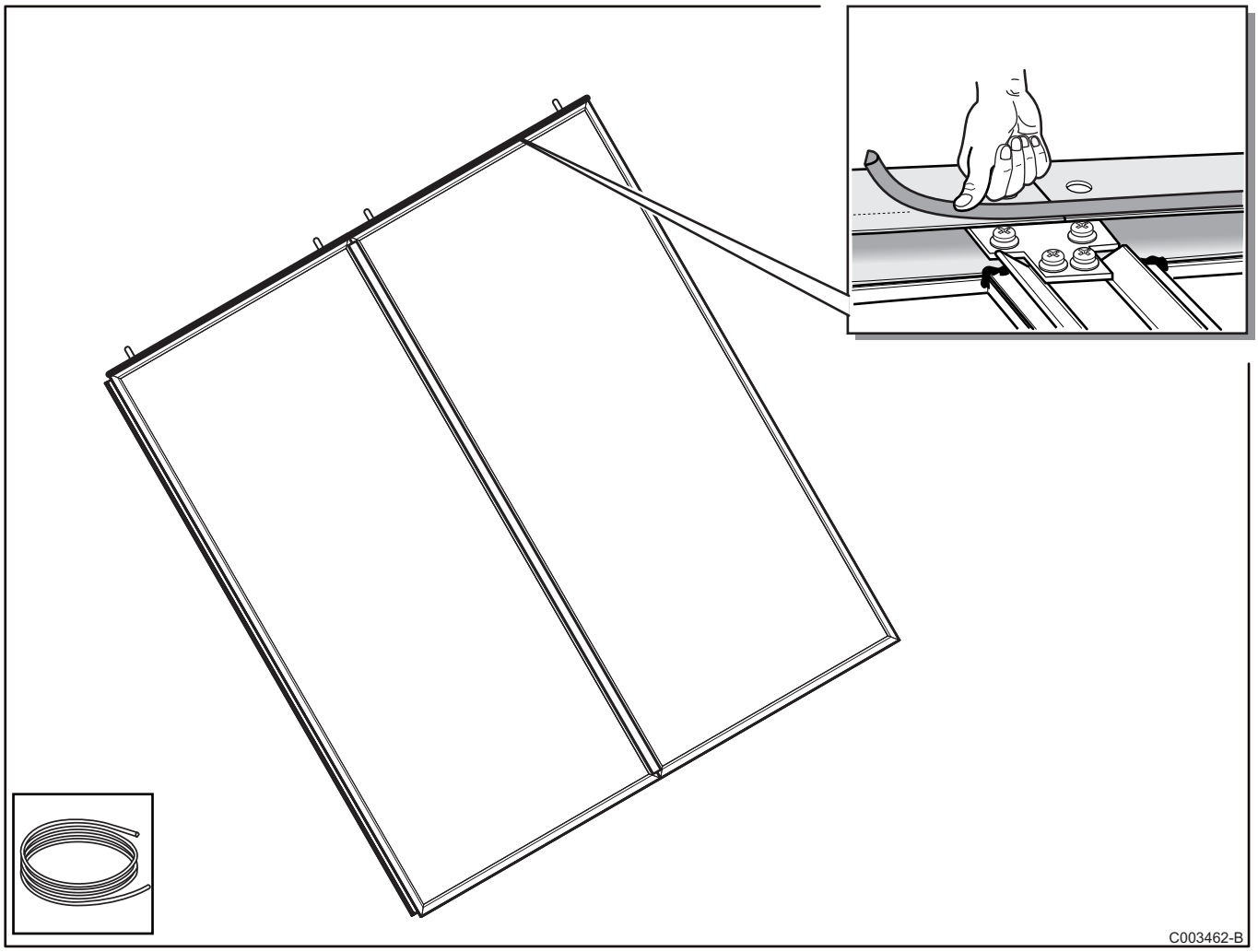
CAUTION

If the collectors are mounted with the flow and return connections at the bottom, reposition and tighten the fittings before putting the lower roofing plate in place.

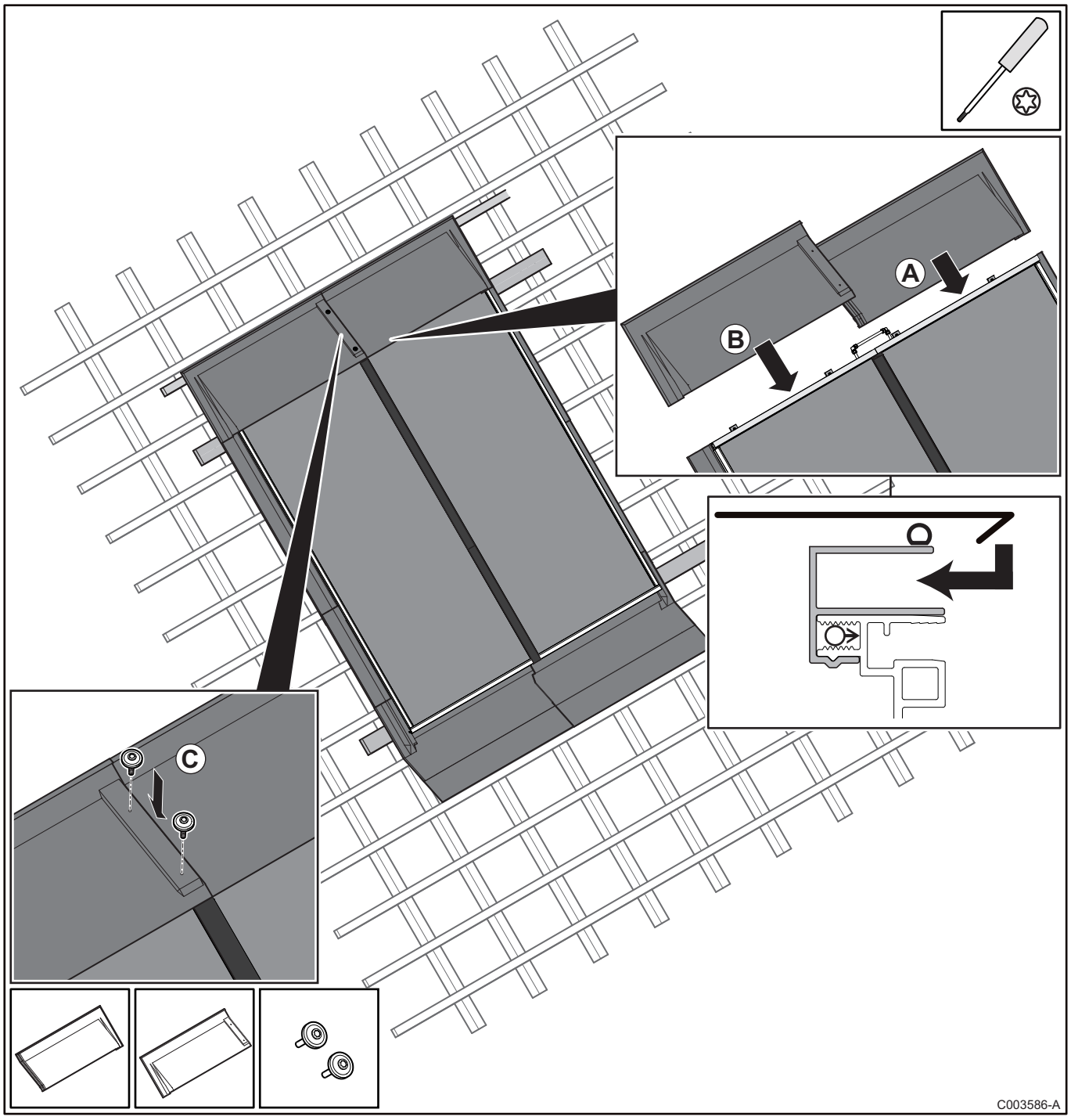
■ Mount the side roofing plates



■ Fitting the foam seal



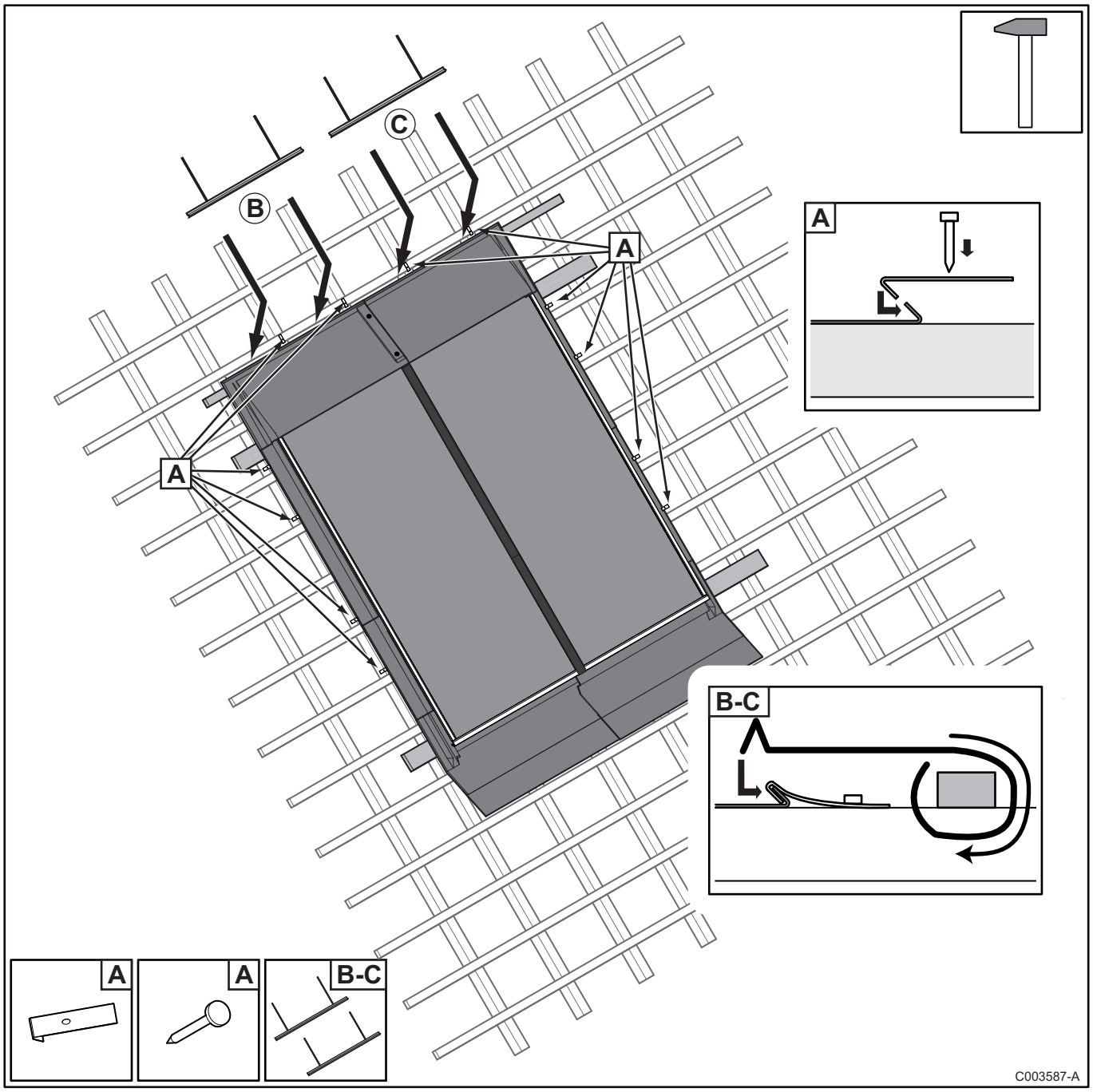
■ Mounting the upper roofing plates



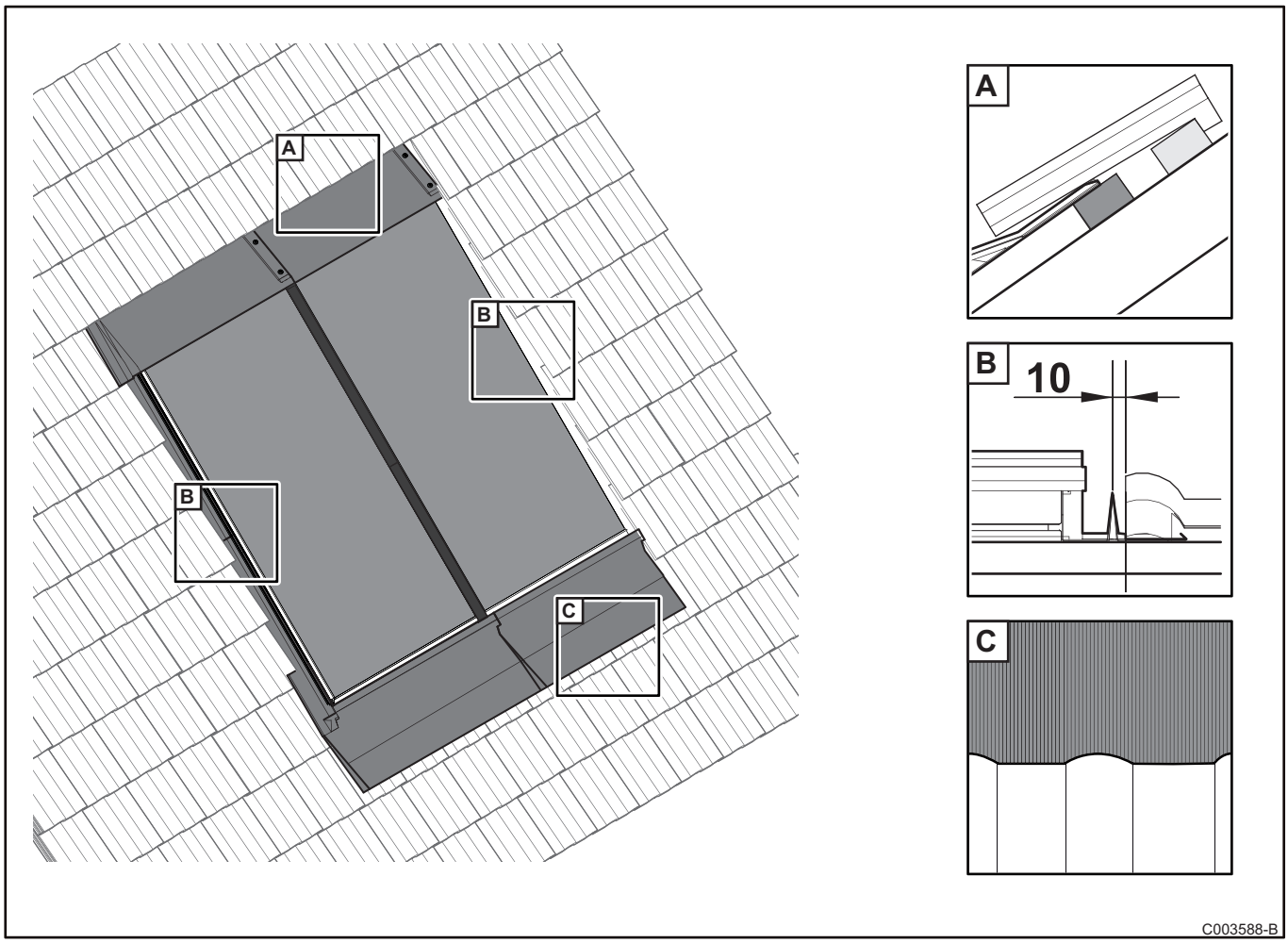
CAUTION

If the collectors are mounted with the flow and return connections at the top, reposition and tighten the fittings before putting the upper roofing plate in place.

■ Fitting the fastening lugs and the tile rests



■ Put the tiles in place

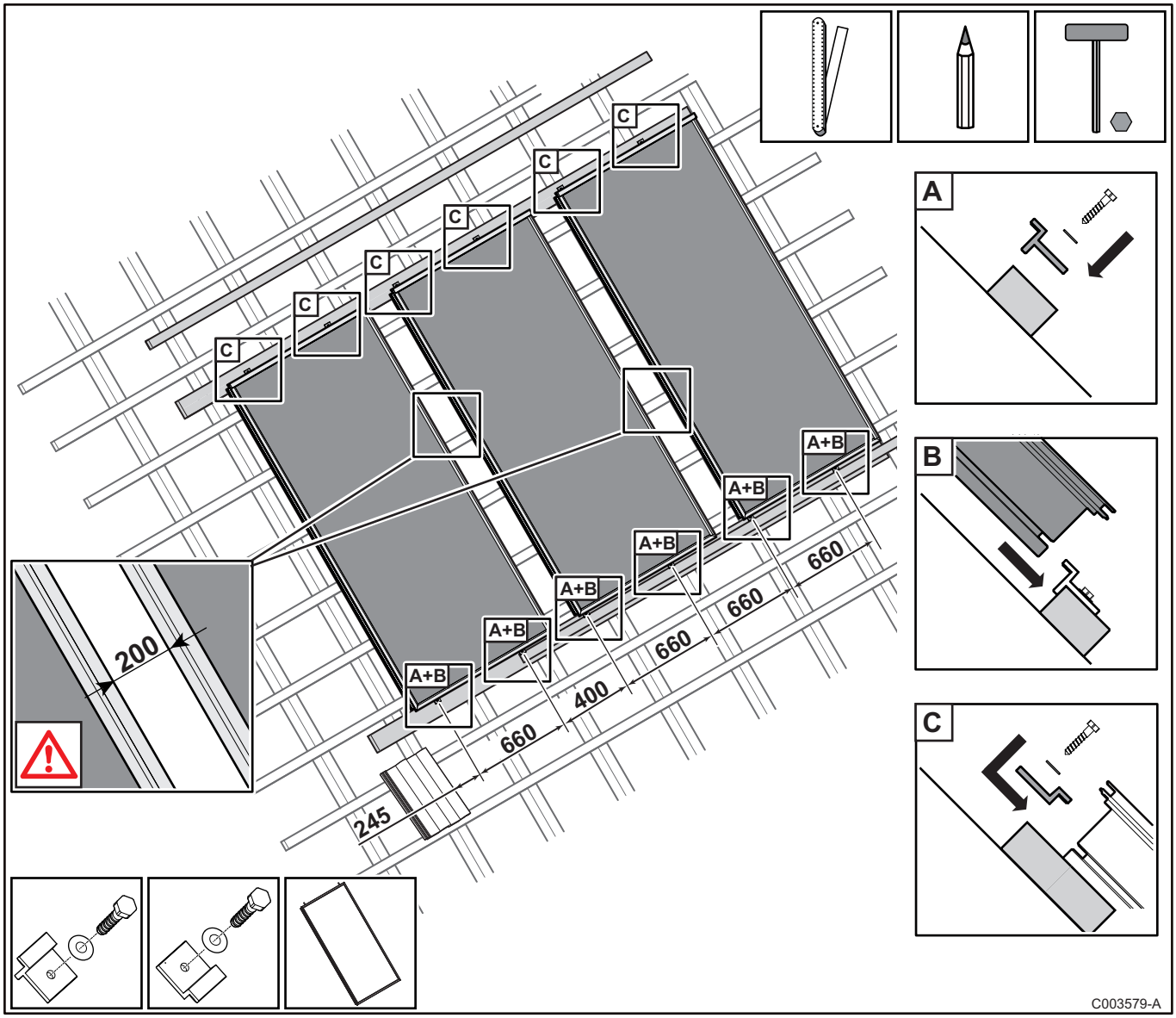


CAUTION

If the tip of the tile is resting on the side roofing plates, it is necessary to cut it to size to ensure that the tile is correctly fitted.

4.5.7. Mounting for an installation with 3 to 5 collectors

■ Positioning the solar collectors



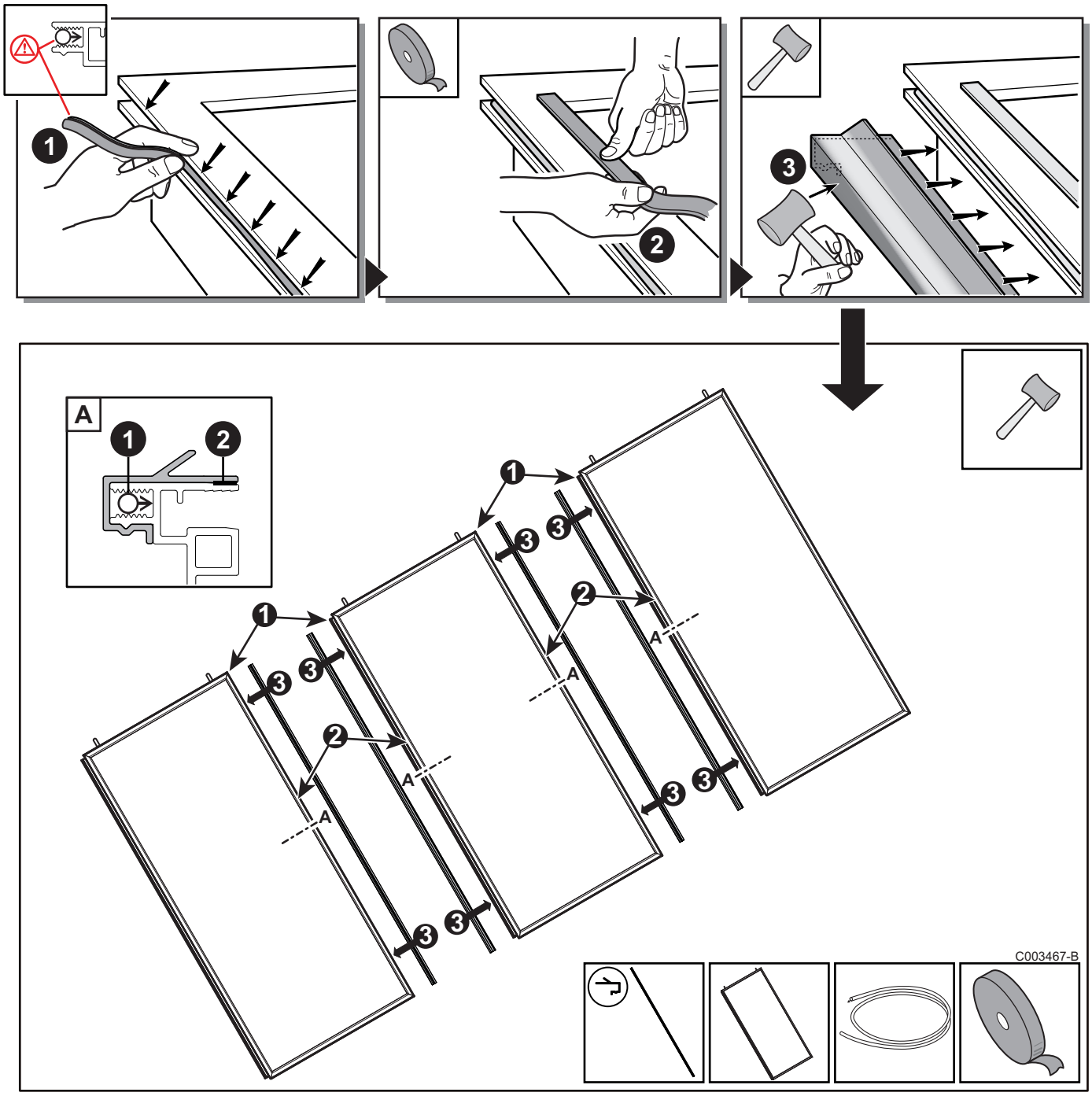
A Screw the lower fastening lugs onto the bottom batten.

B Position the collectors. The fastening lugs must be fitted into the holding groove.

C Postion the upper fastening lugs in the holding groove on the collectors and screw them onto the batten.

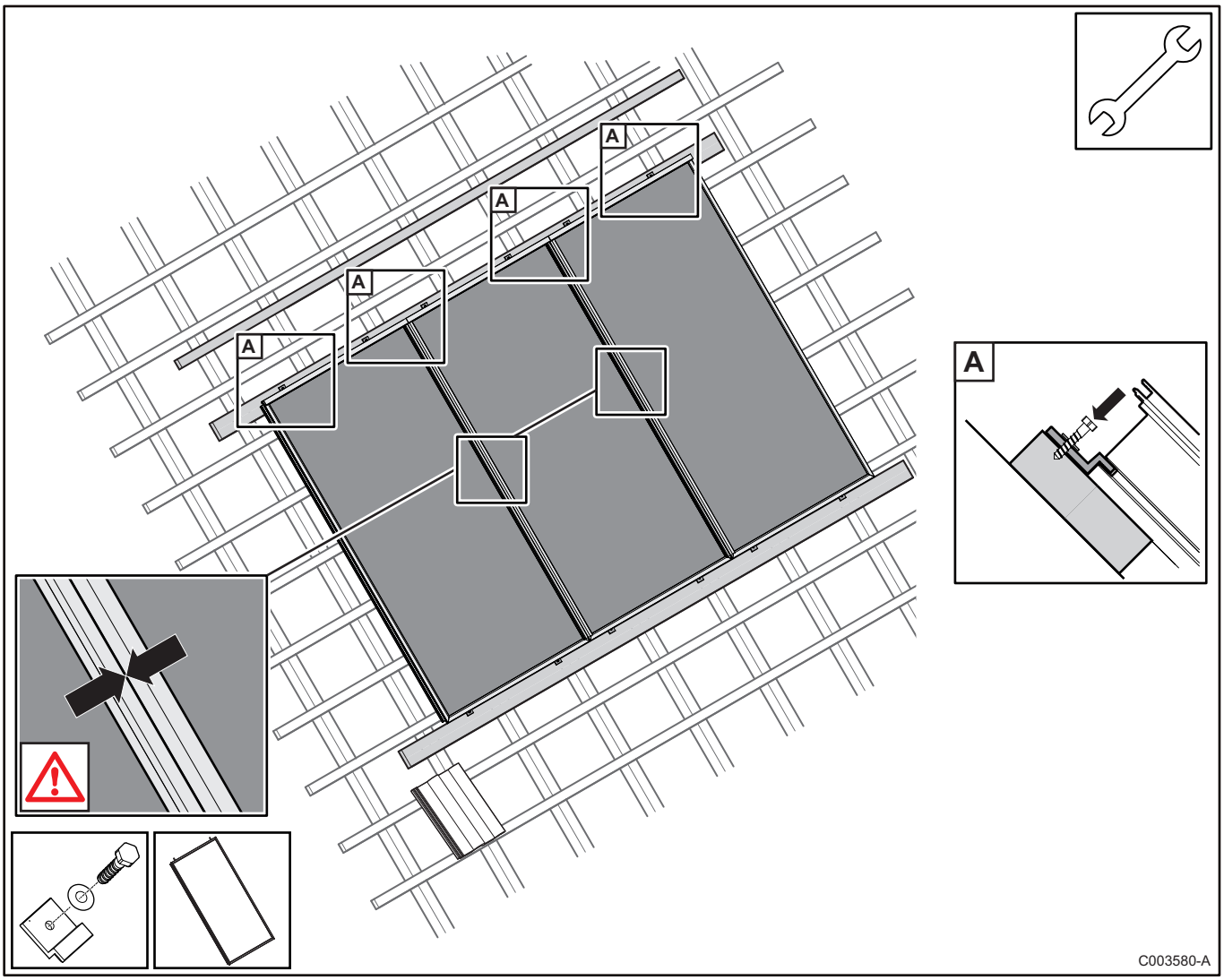
The solar panels should only be installed shortly before the solar-heating system is to be commissioned. This will minimise the time that the solar panels are exposed to heat while not filled with heat-transporting fluid.

■ Fitting the intermediary seals and clips



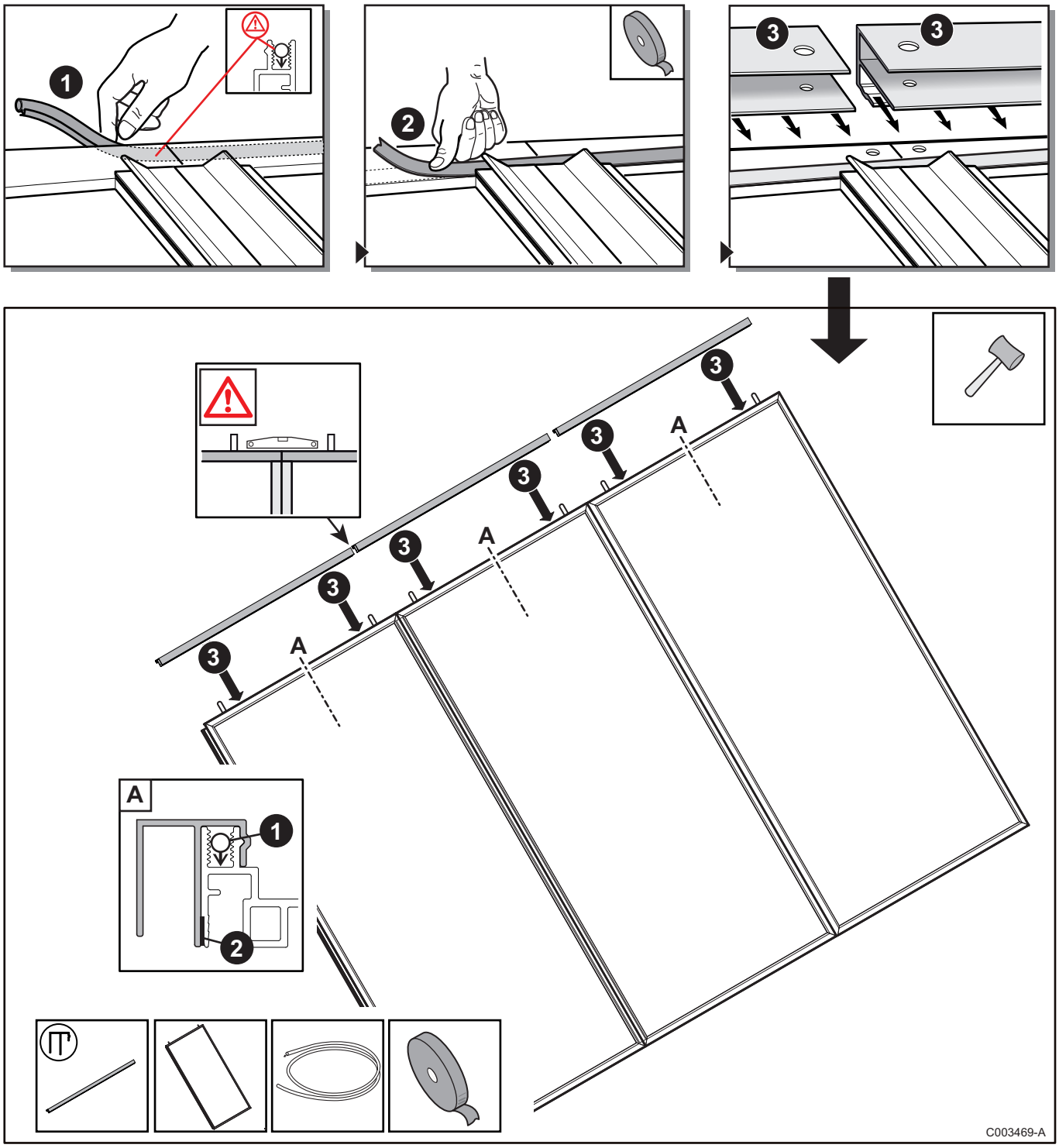
1. Fit the seal, without the clamp, into the groove along the entire height of the 2 collectors.
2. Glue the intermediary flat seal to the 2 collectors.
3. Fit the intermediary clips using the mallet, aligning them with the bottom of the collectors.

■ Assembling and securing the 3 collectors



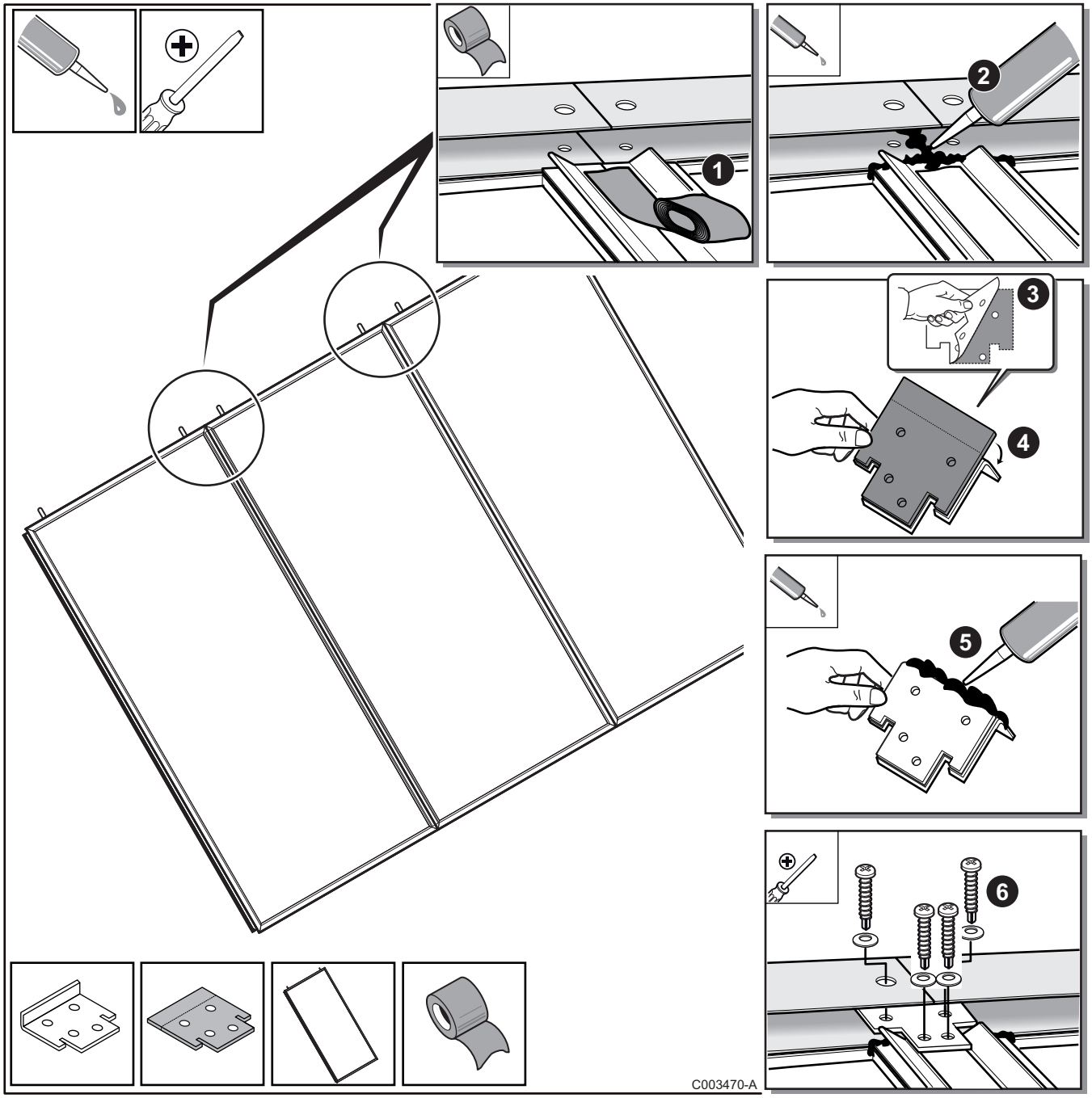
A Fit the second collector alongside the first and secure them.

■ Fitting the upper seals and clips



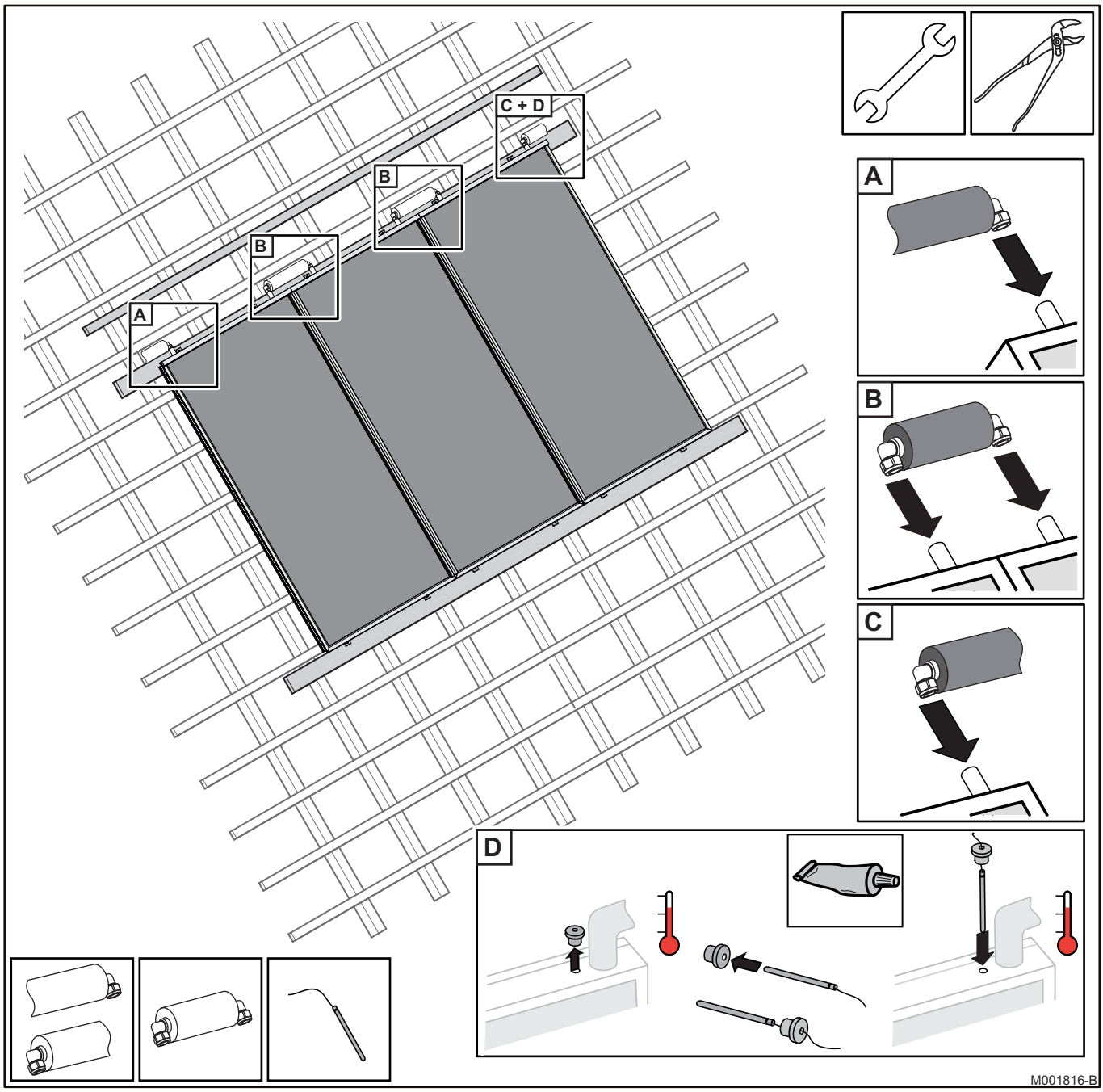
1. Fit the seal, without the clamp, into the upper groove on the 2 collectors.
2. Glue the flat seal along the entire width of the 2 collectors.
3. Fit the upper clips using the mallet.

■ Waterproofing the connection between the 3 collectors



1. Glue the BUTYL strip to the intermediary clips, leaving 3 mm clearance.
2. Squeeze silicone on to the joints between the mounting components.
3. Remove the protective film from the self-adhesive foam.
4. Glue the self-adhesive foam to the covering plate.
5. Cover the upper part of the covering plate with silicone.
6. Fit the covering plate, secure it and spread a veil of silicone over it.

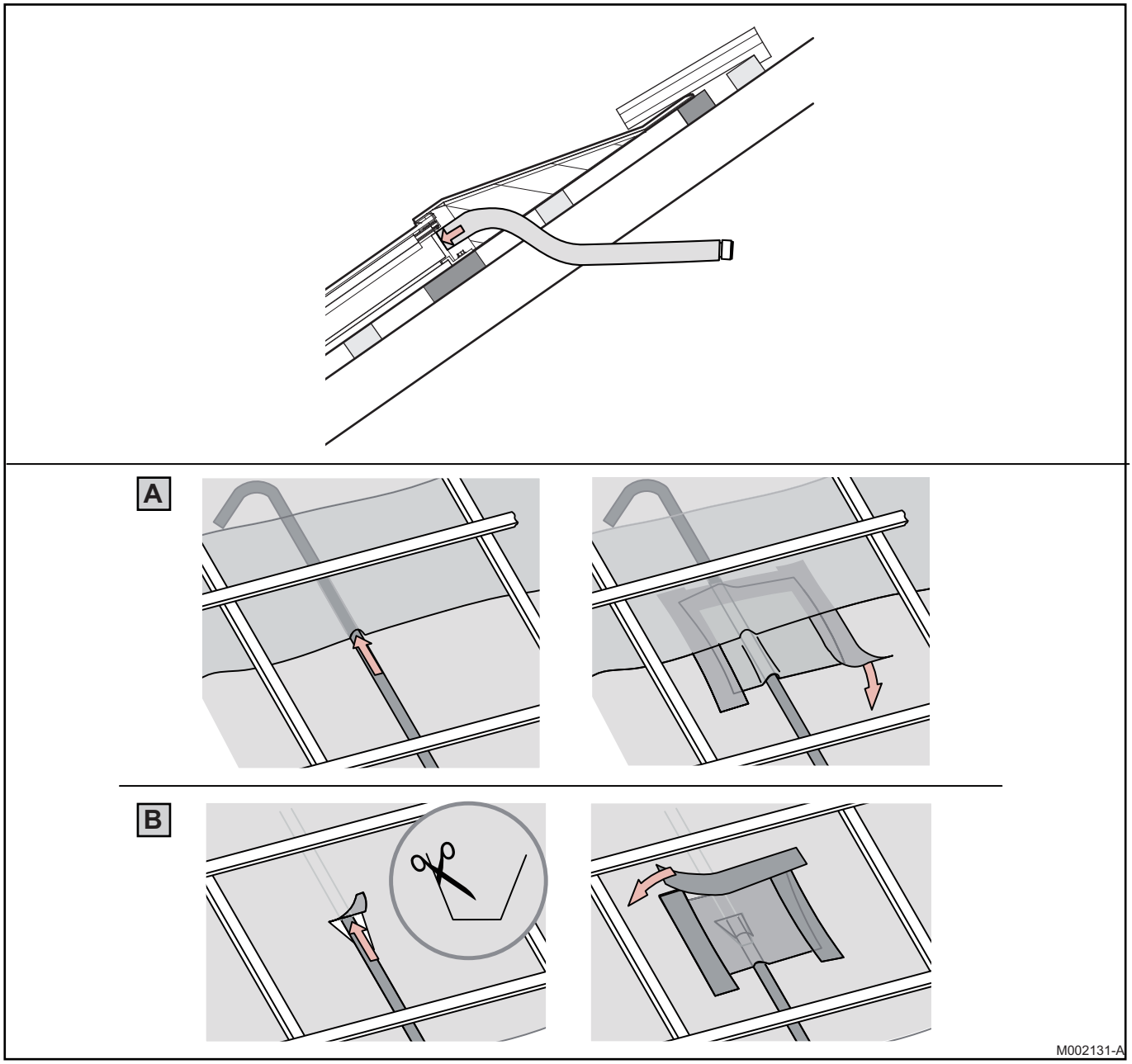
■ Connecting the solar collectors



CAUTION

Install the temperature sensor in the sensor tube on the solar collector, at the flow end of the bank of collectors. The transfer of heat between the sensor socket and the temperature sensor can be improved by the use of heat-conducting paste.

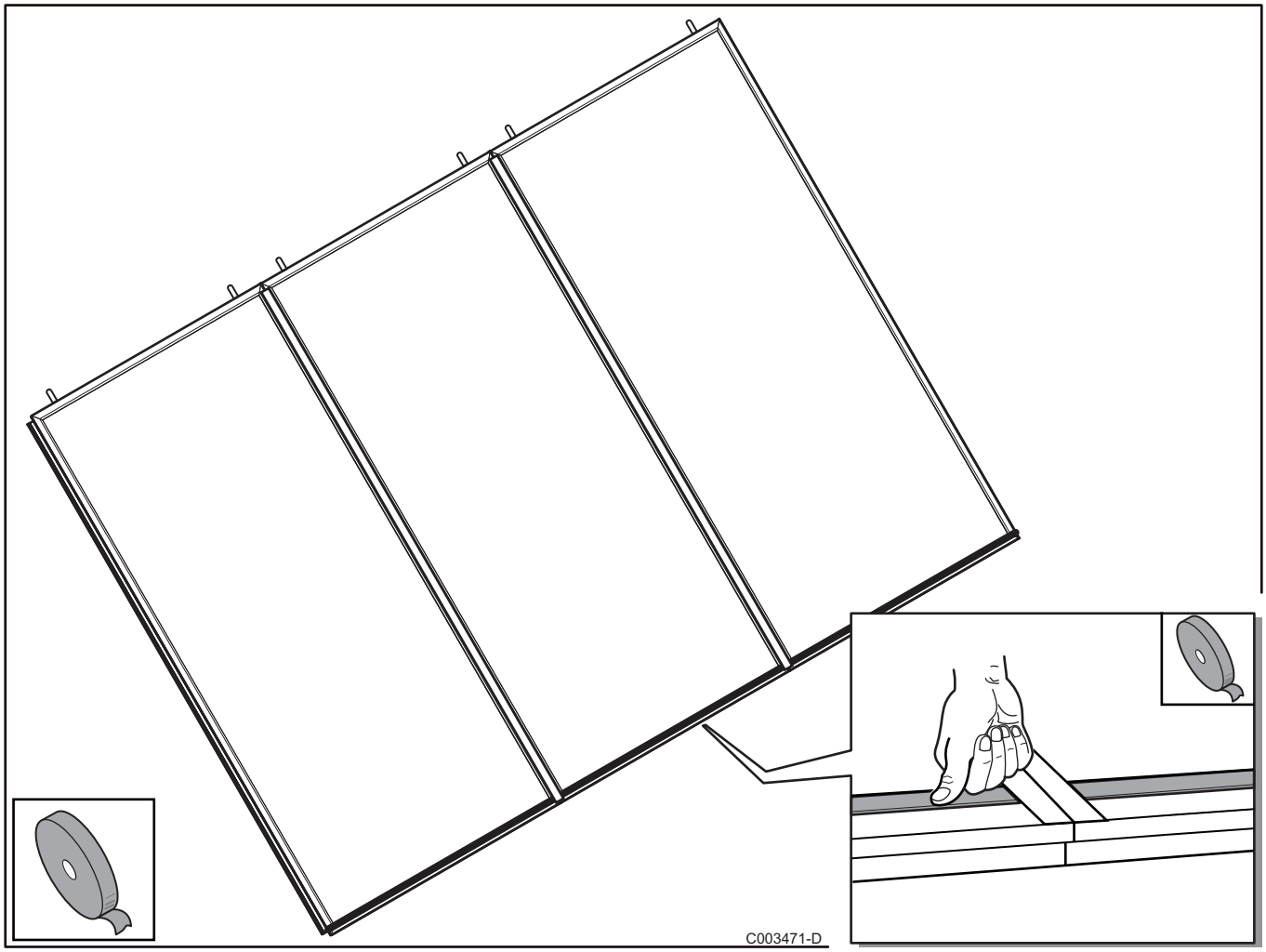
■ Passing Pipes and Cable through the Roof



A Scenario with two overlapping sheets of film under the roof

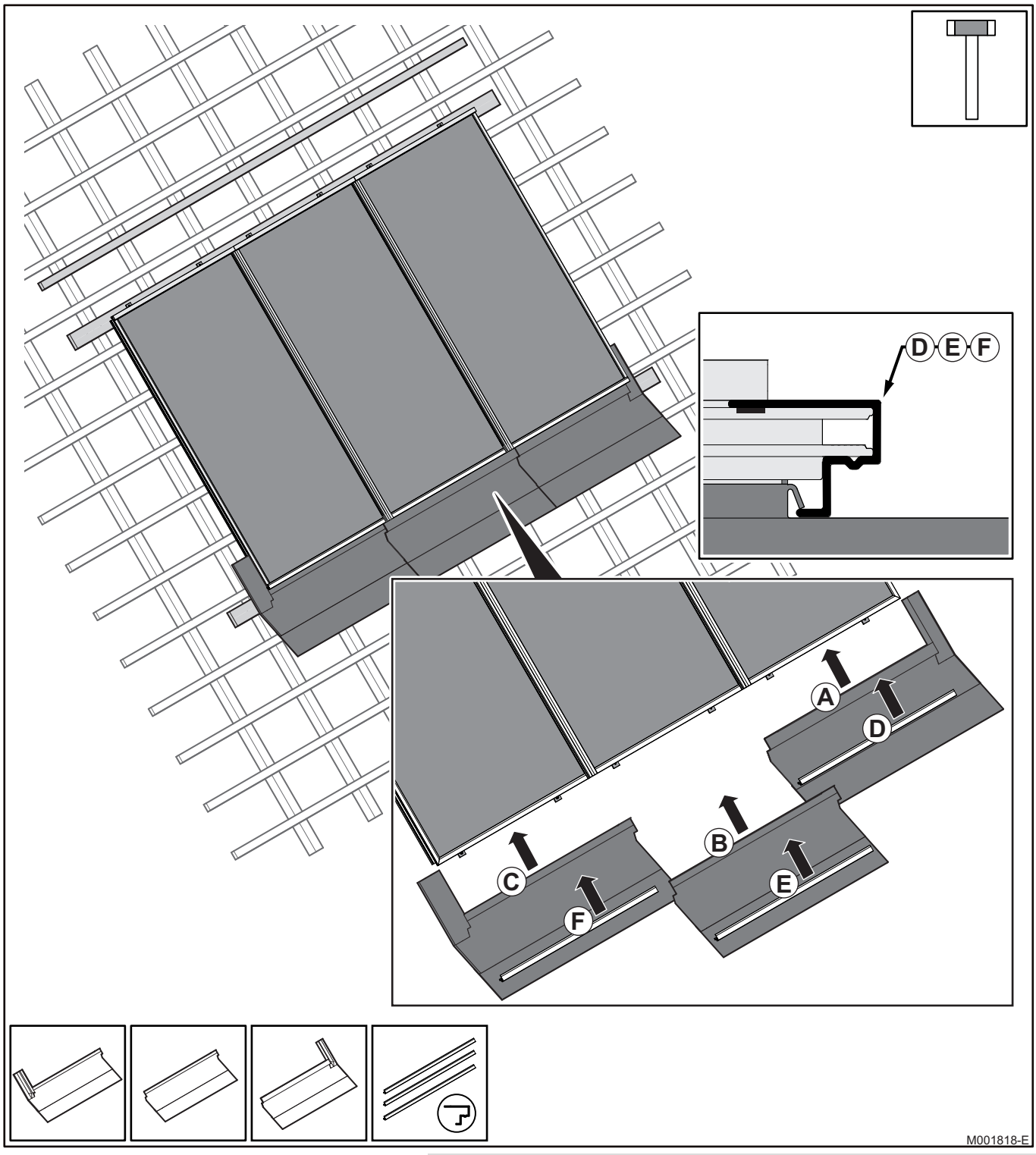
B Scenario with a single sheet of film under the roof

■ Fitting the lower flat seal



Fit the flat seal along the lower part of the 3 collectors.

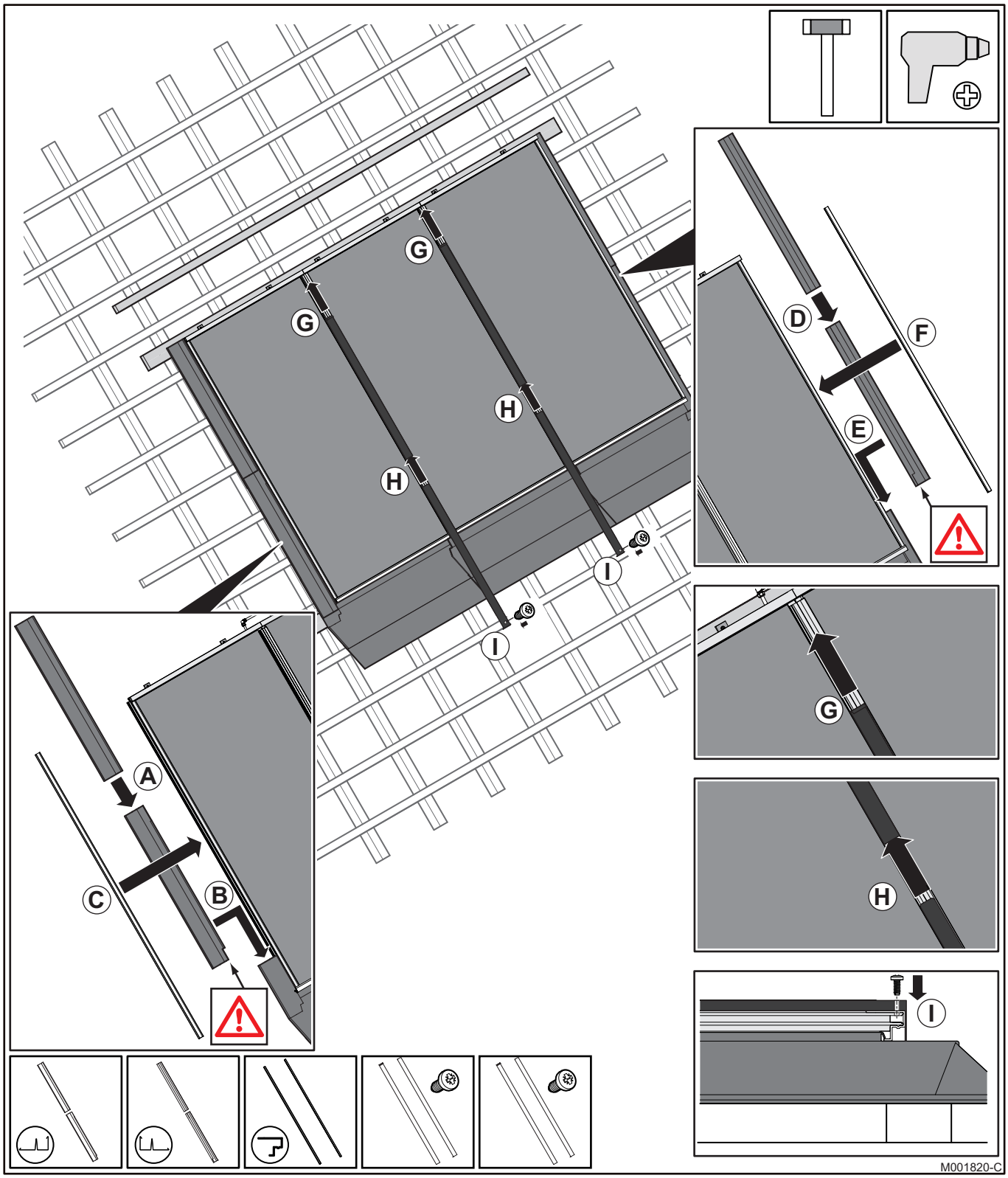
■ Mounting the lower roofing plates



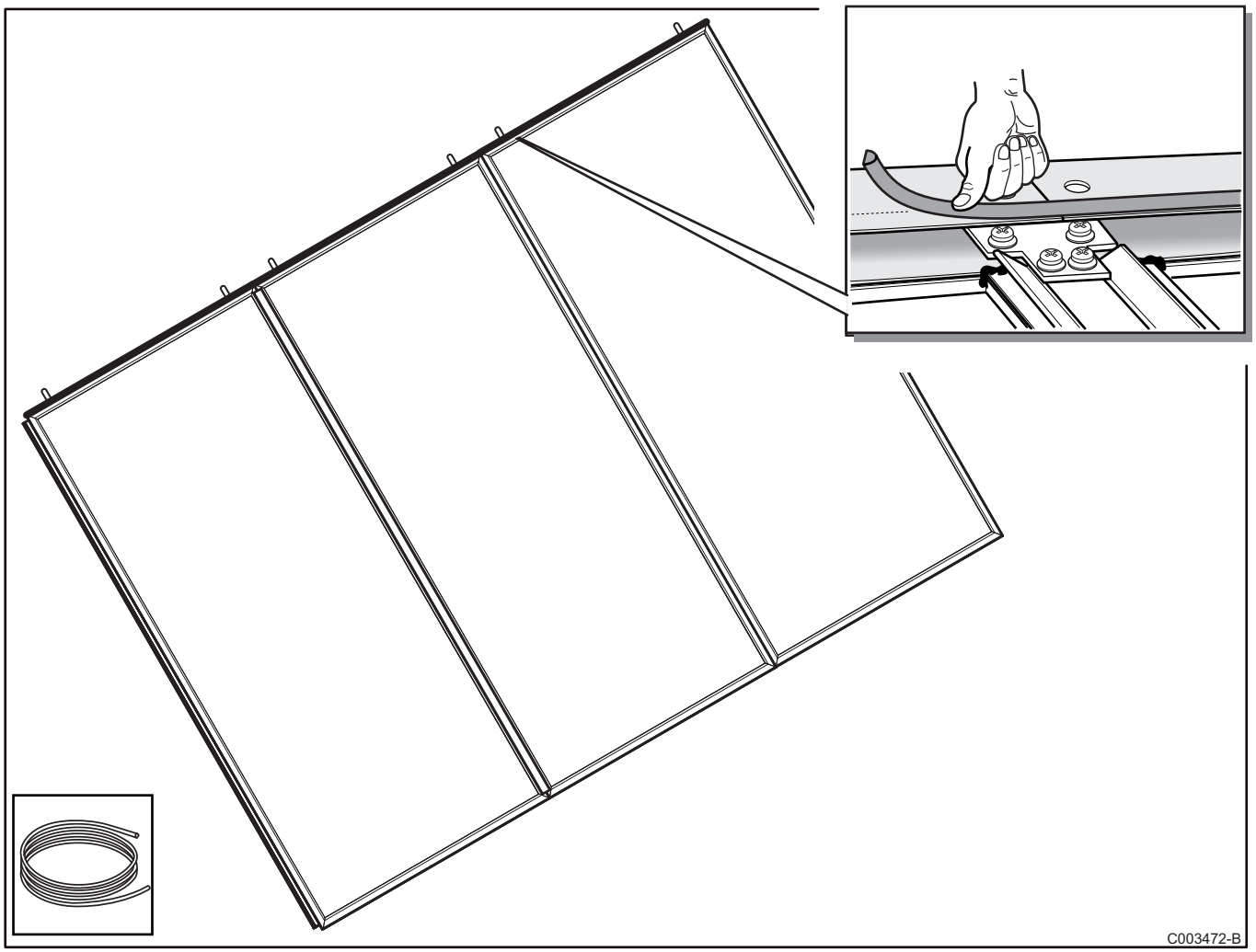
CAUTION

If the collectors are mounted with the flow and return connections at the bottom, reposition and tighten the fittings before putting the lower roofing plate in place.

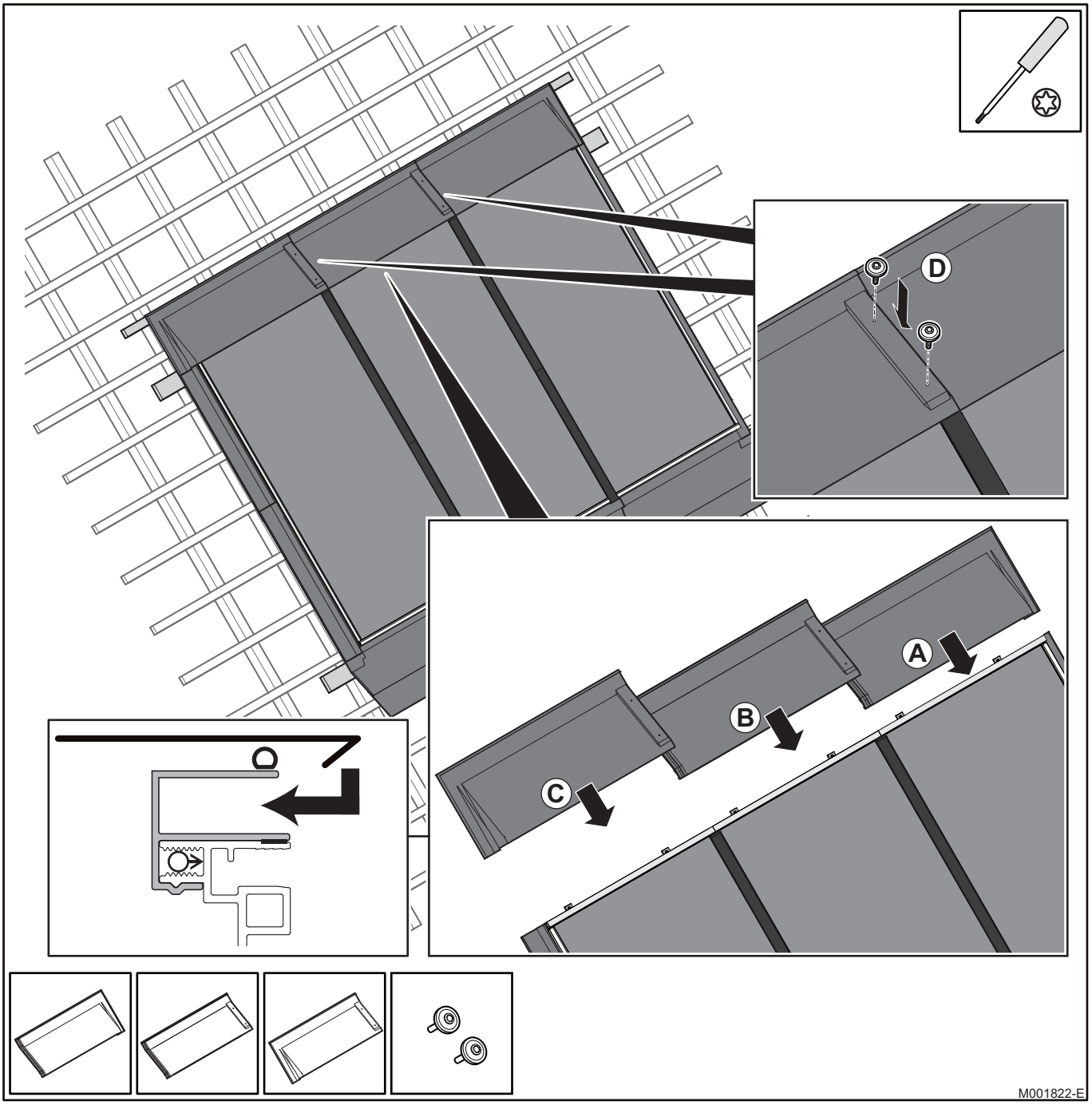
■ Mount the side roofing plates



■ Fitting the foam seal



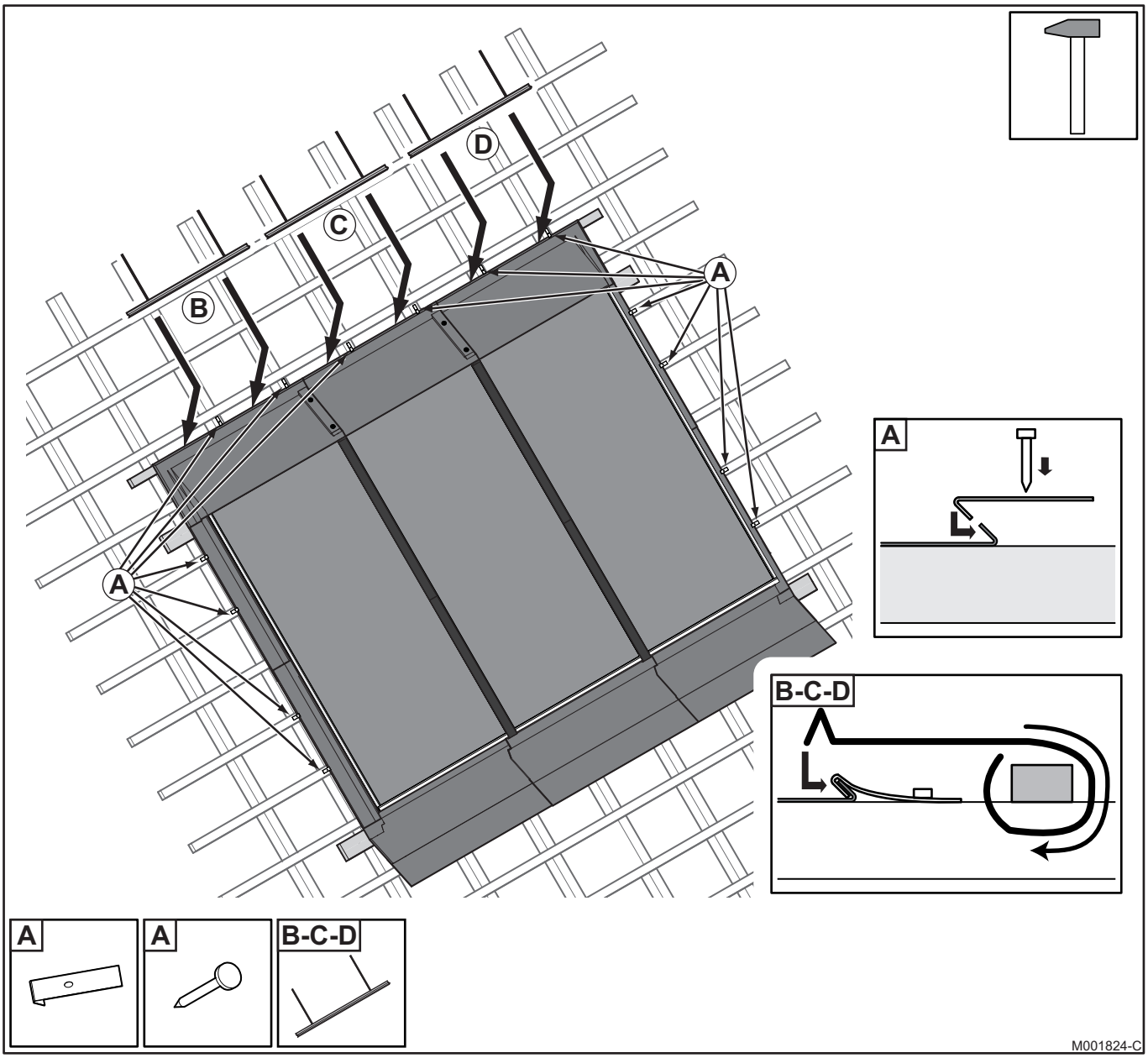
■ Mounting the upper roofing plates



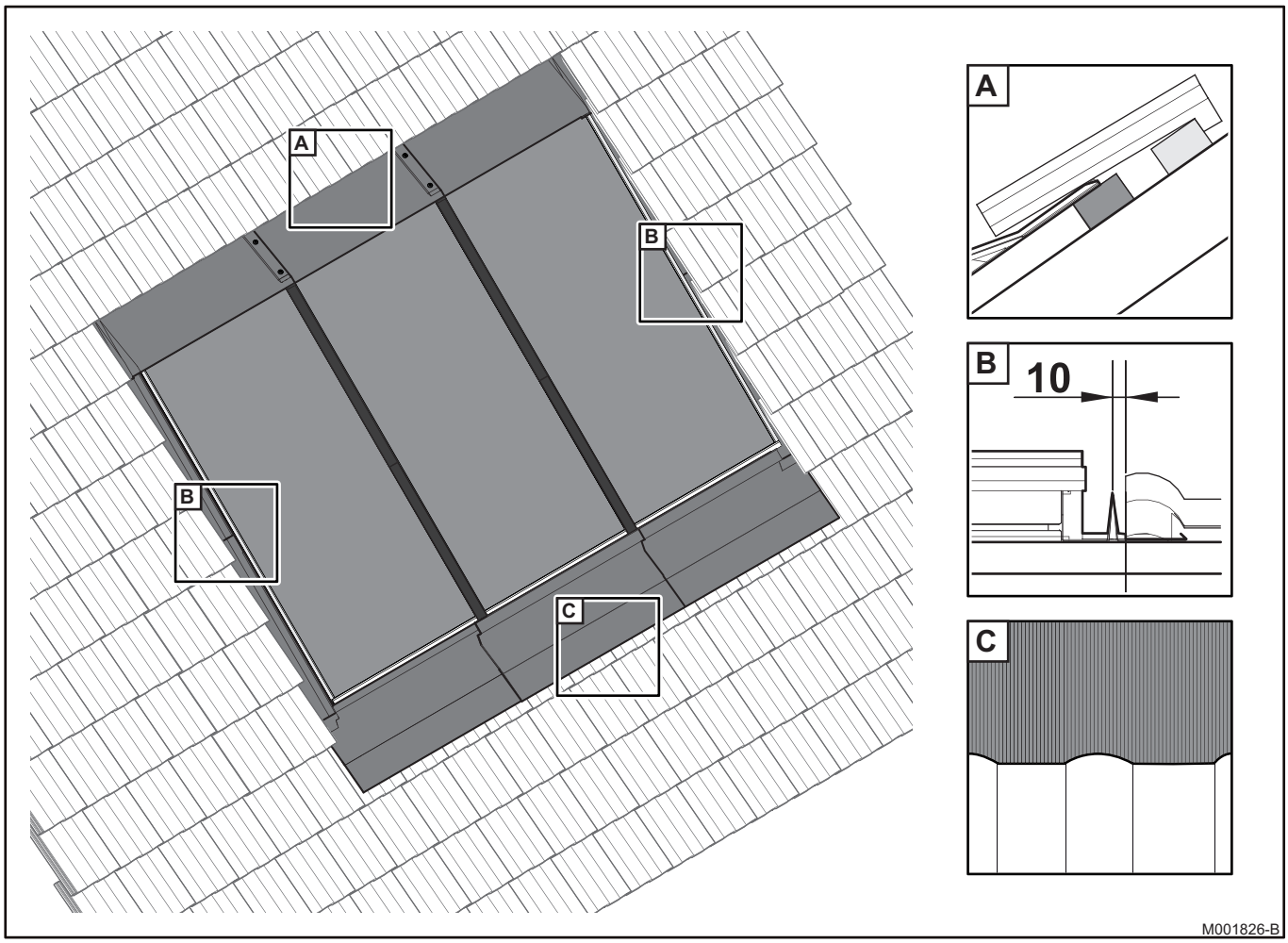
CAUTION

If the collectors are mounted with the flow and return connections at the top, reposition and tighten the fittings before putting the upper roofing plate in place.

■ Fitting the fastening lugs and the tile rests



■ Put the tiles in place

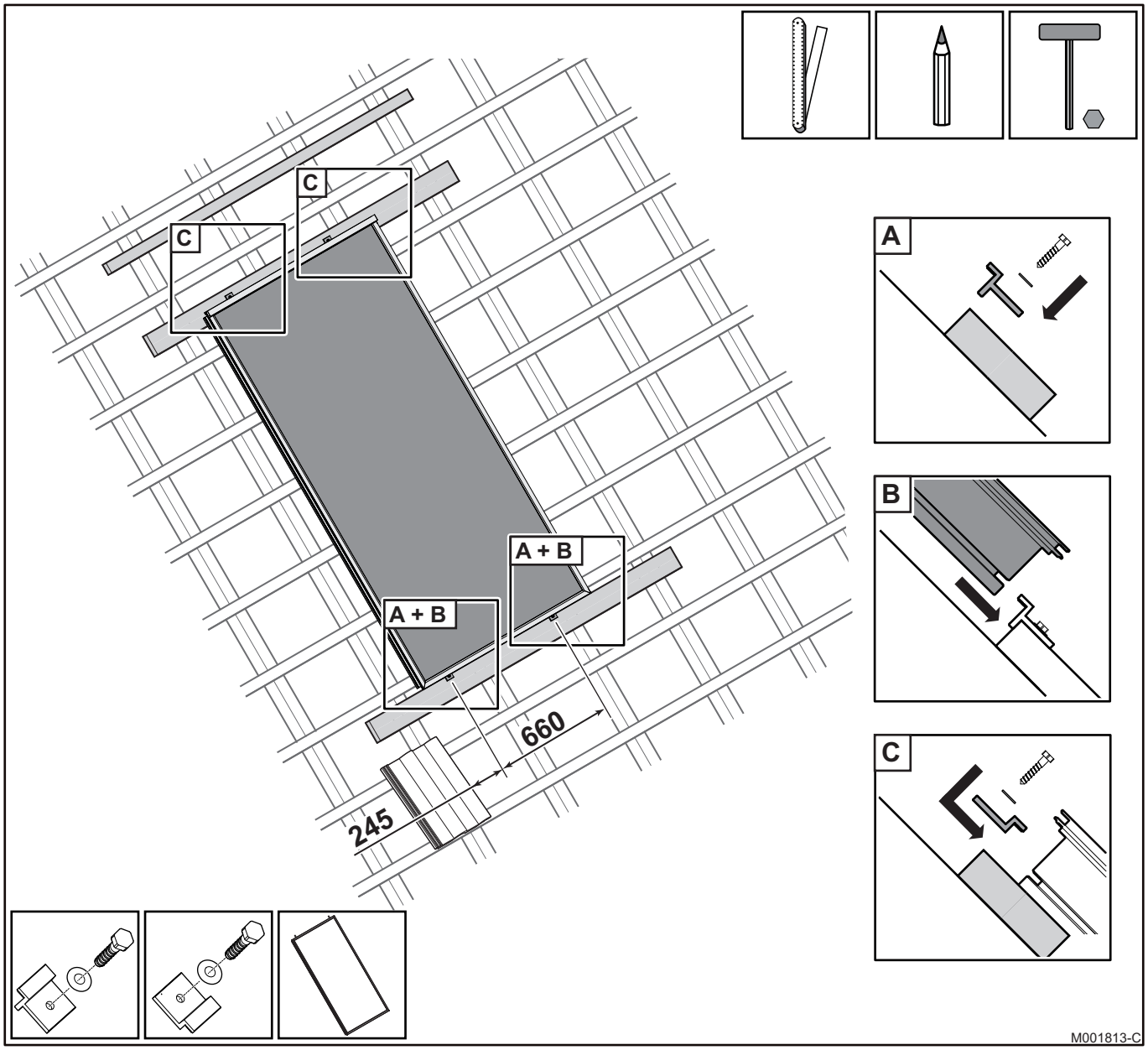


CAUTION

If the tip of the tile is resting on the side roofing plates, it is necessary to cut it to size to ensure that the tile is correctly fitted.

4.5.8. Mounting for an installation with 1 collector

■ Installing the solar collector



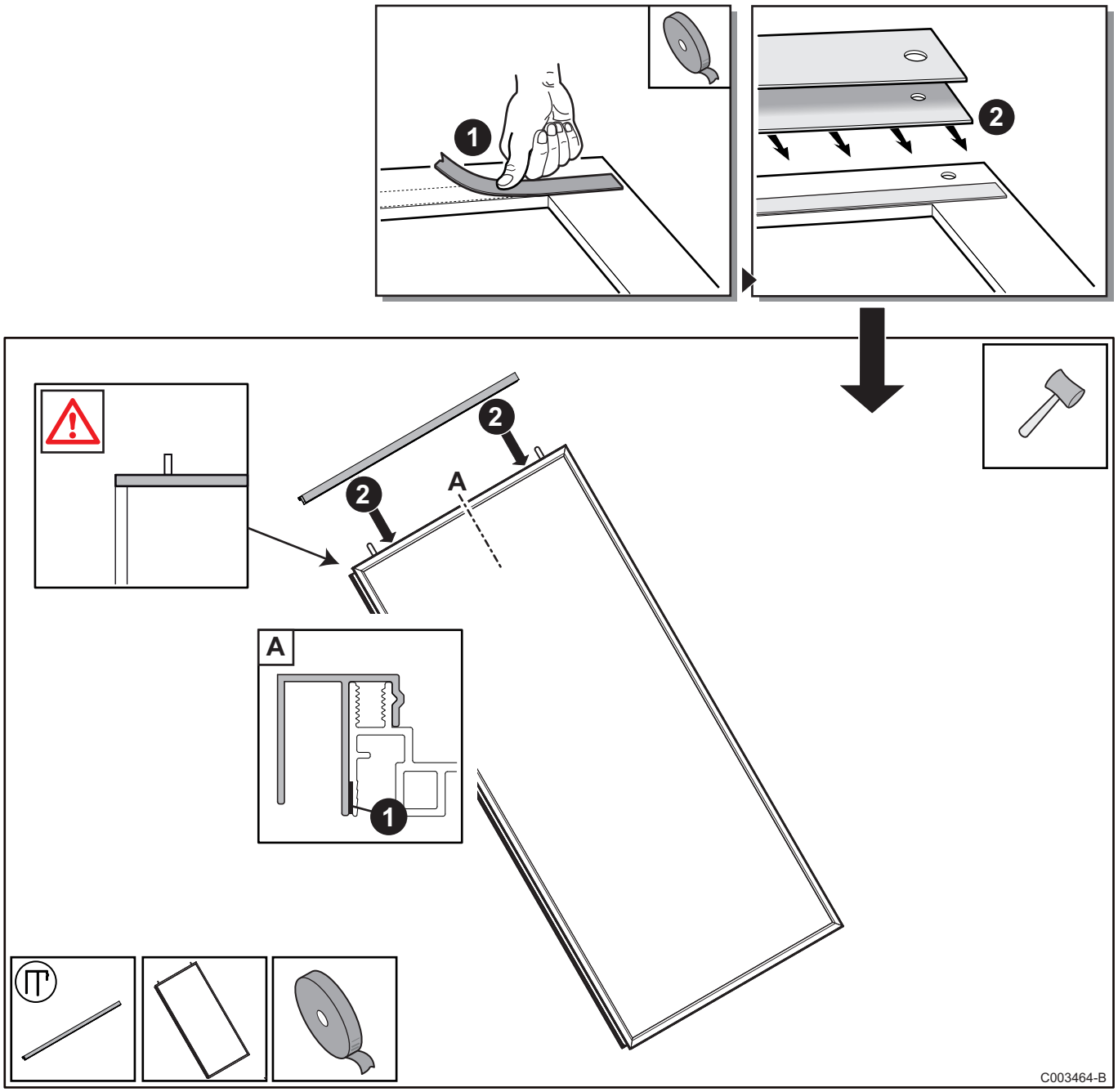
A Screw the lower fastening lugs onto the bottom batten.

B Fit the collector. The fastening lugs must be fitted into the holding groove.

C Postion the upper fastening lugs in the holding groove on the collectors and screw them onto the batten.

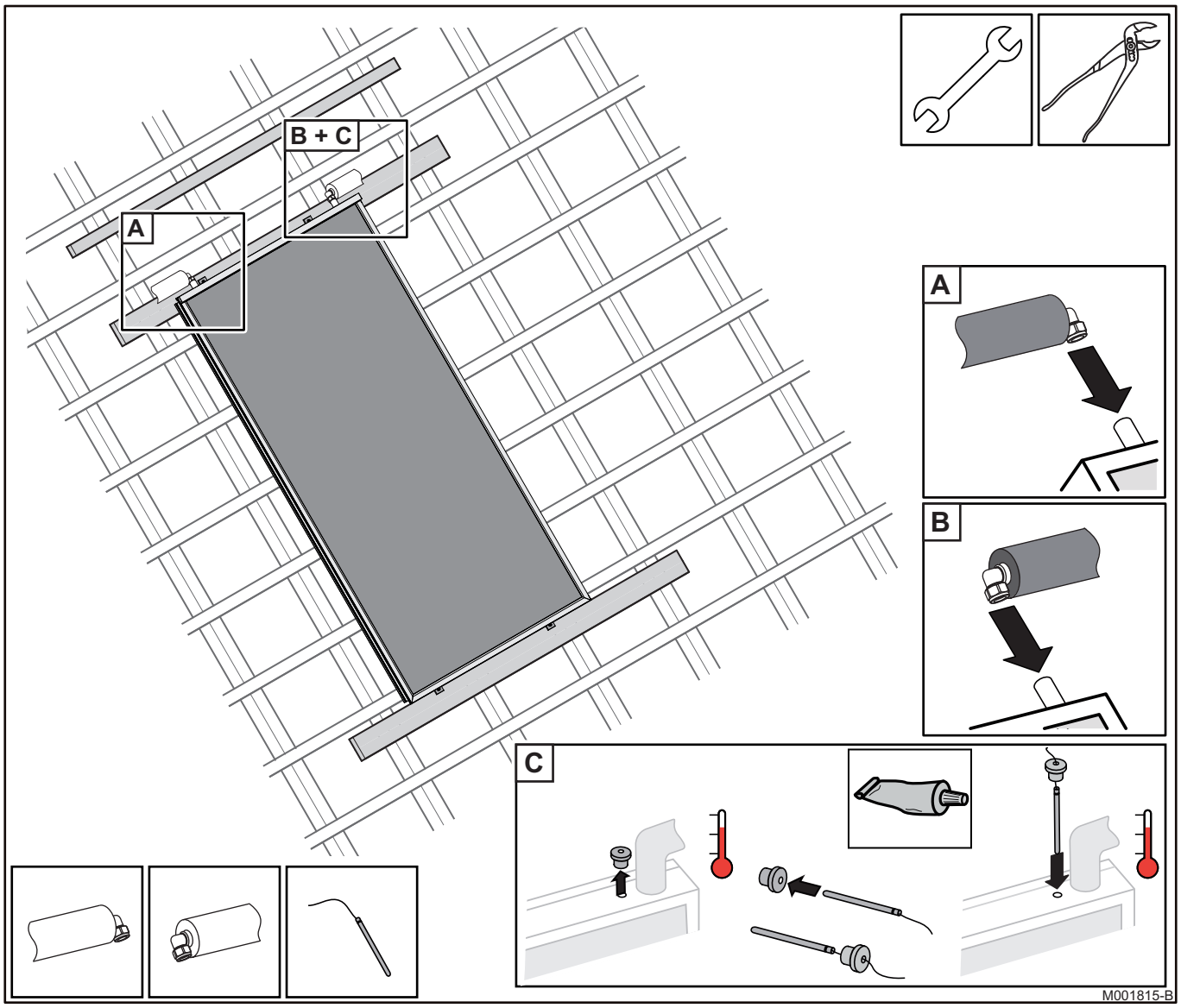
The solar panels should only be installed shortly before the solar-heating system is to be commissioned. This will minimise the time that the solar panels are exposed to heat while not filled with heat-transporting fluid.

■ Fitting the seal and the upper clip



1. Glue the flat seal.
2. Fit the upper clip using the mallet.

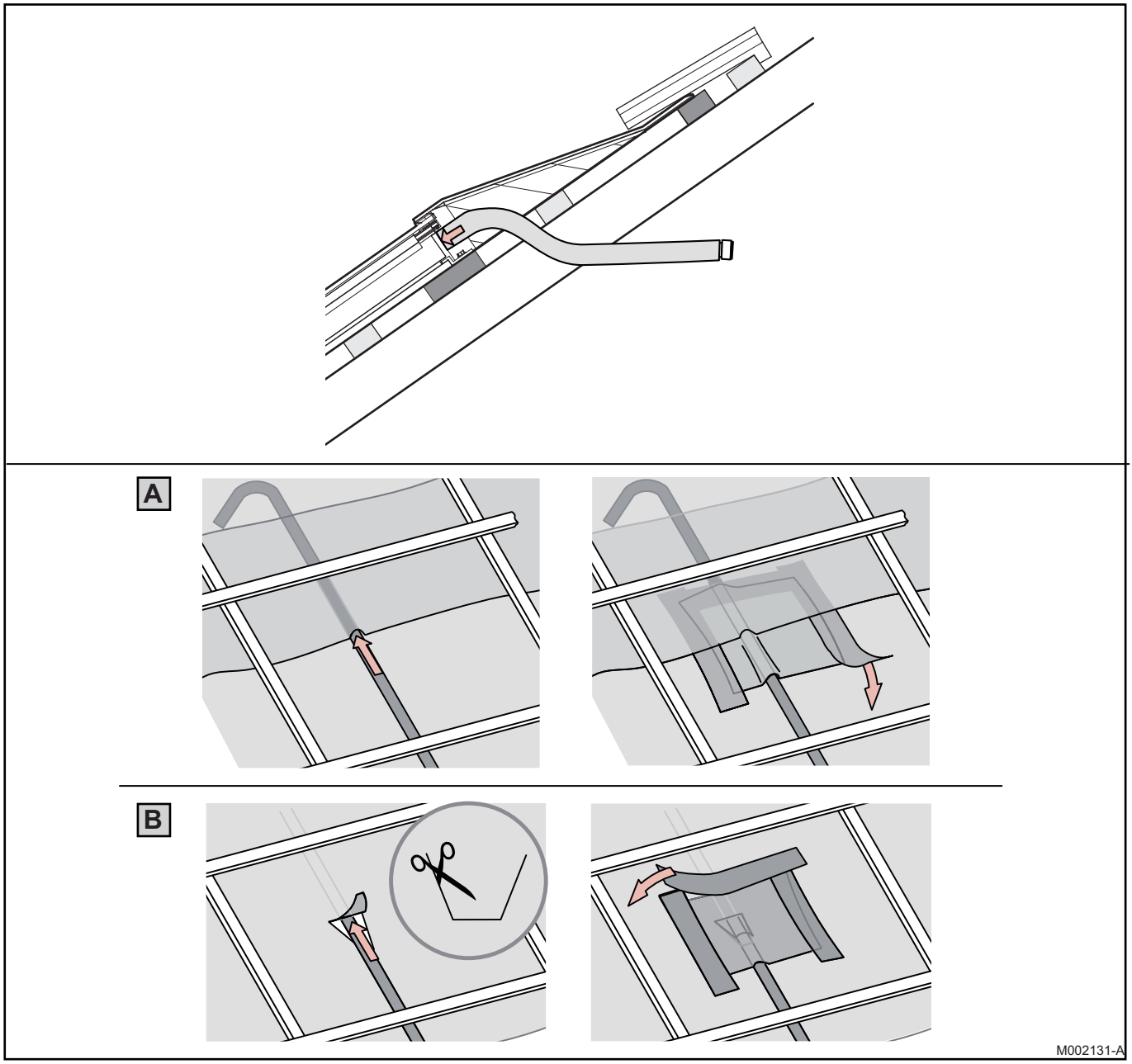
■ Connecting the solar collector



CAUTION

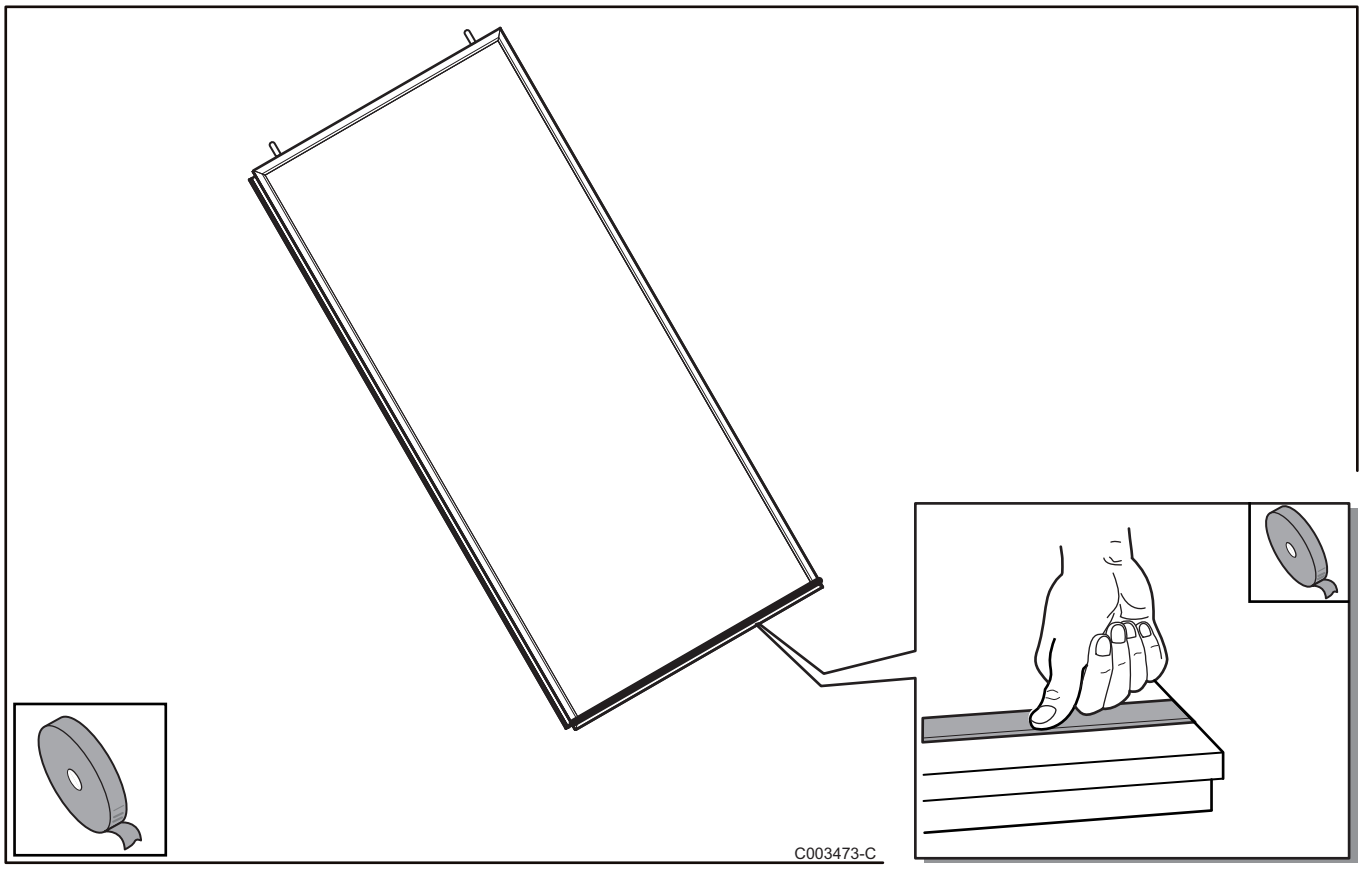
Install the temperature sensor in the sensor tube on the solar collector.
The transfer of heat between the sensor socket and the temperature sensor can be improved by the use of heat-conducting paste.

■ Passing Pipes and Cable through the Roof

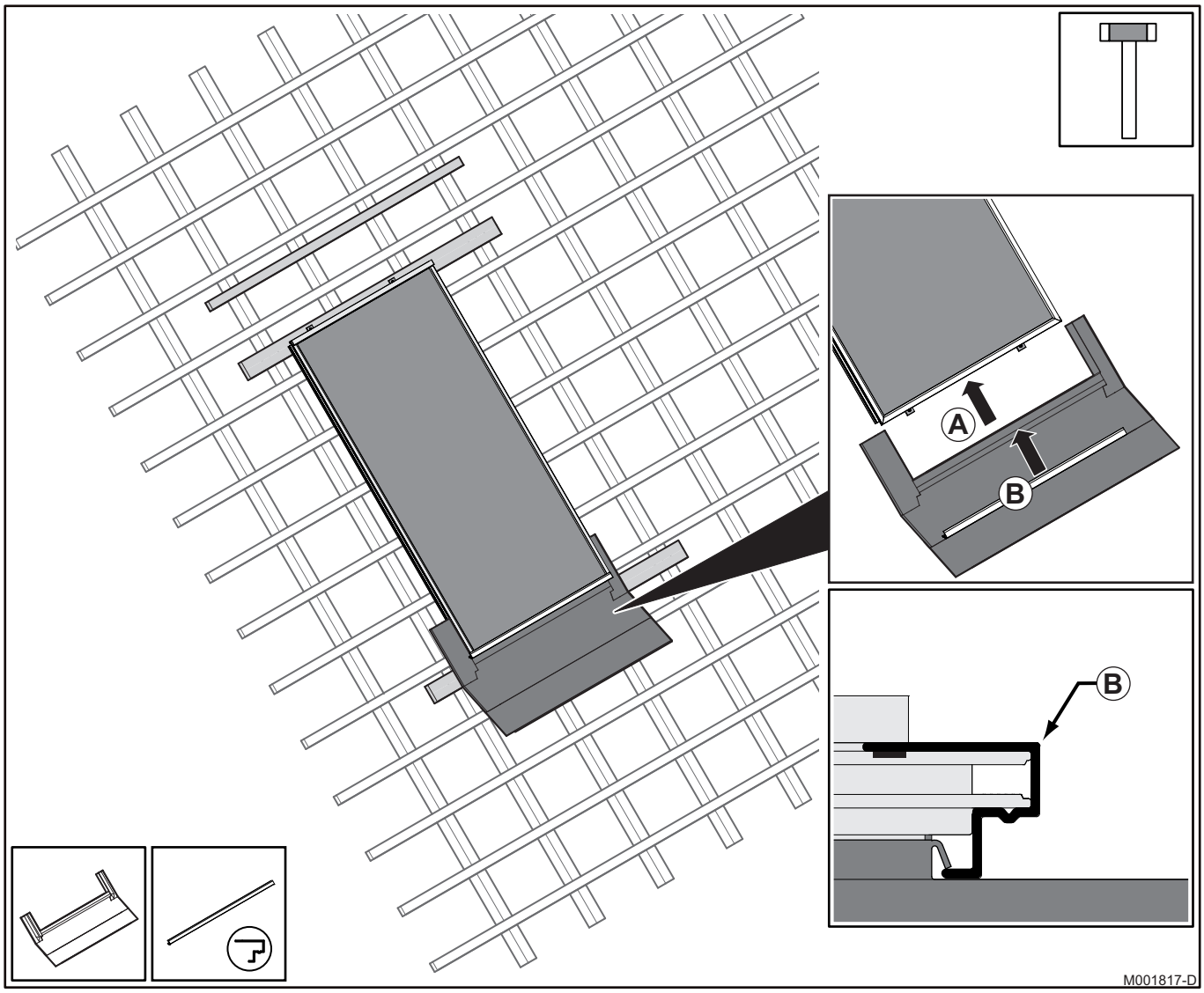


A	Scenario with two overlapping sheets of film under the roof
B	Scenario with a single sheet of film under the roof

■ Fitting the lower flat seal



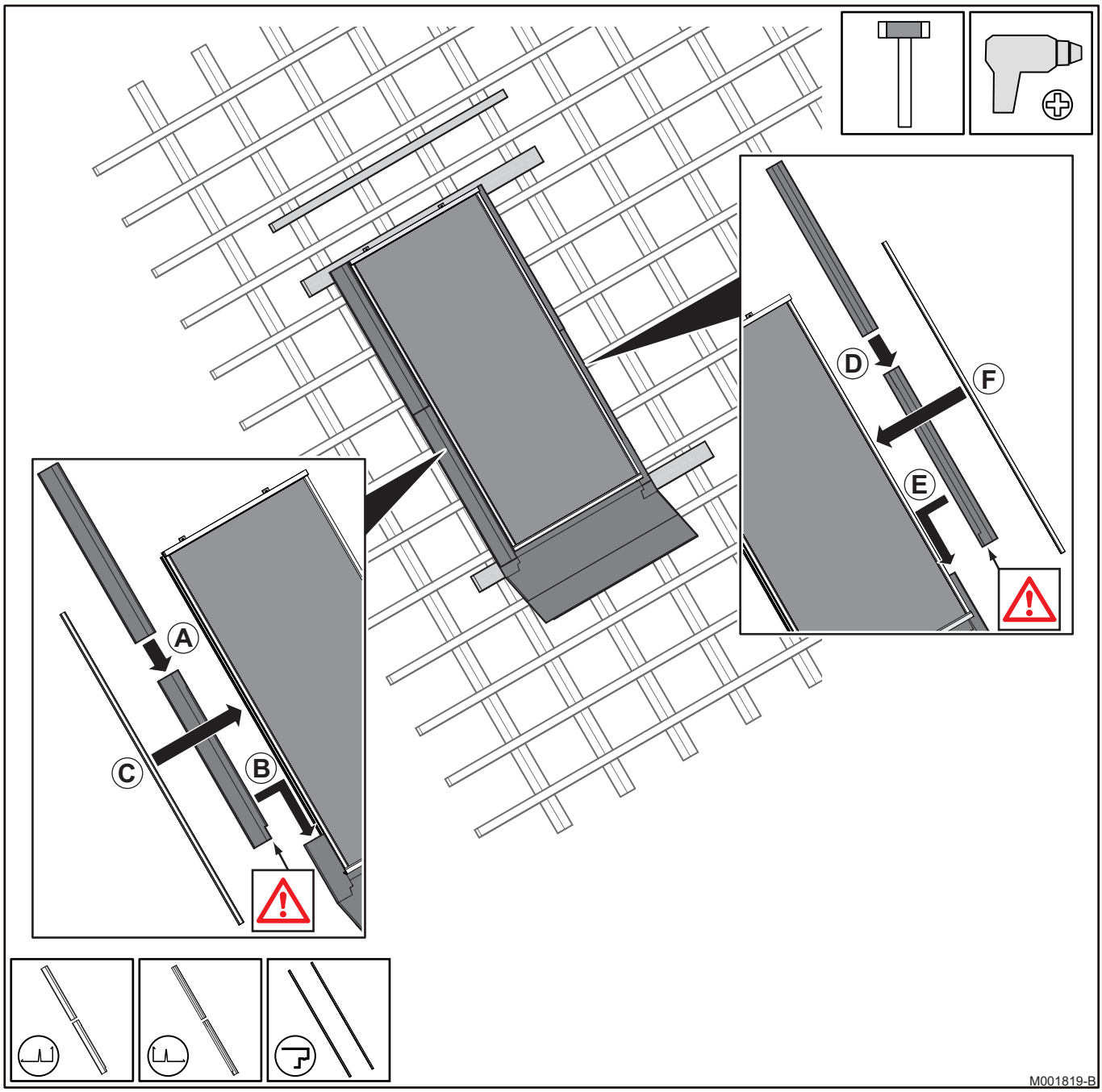
■ Fitting the lower roofing plate



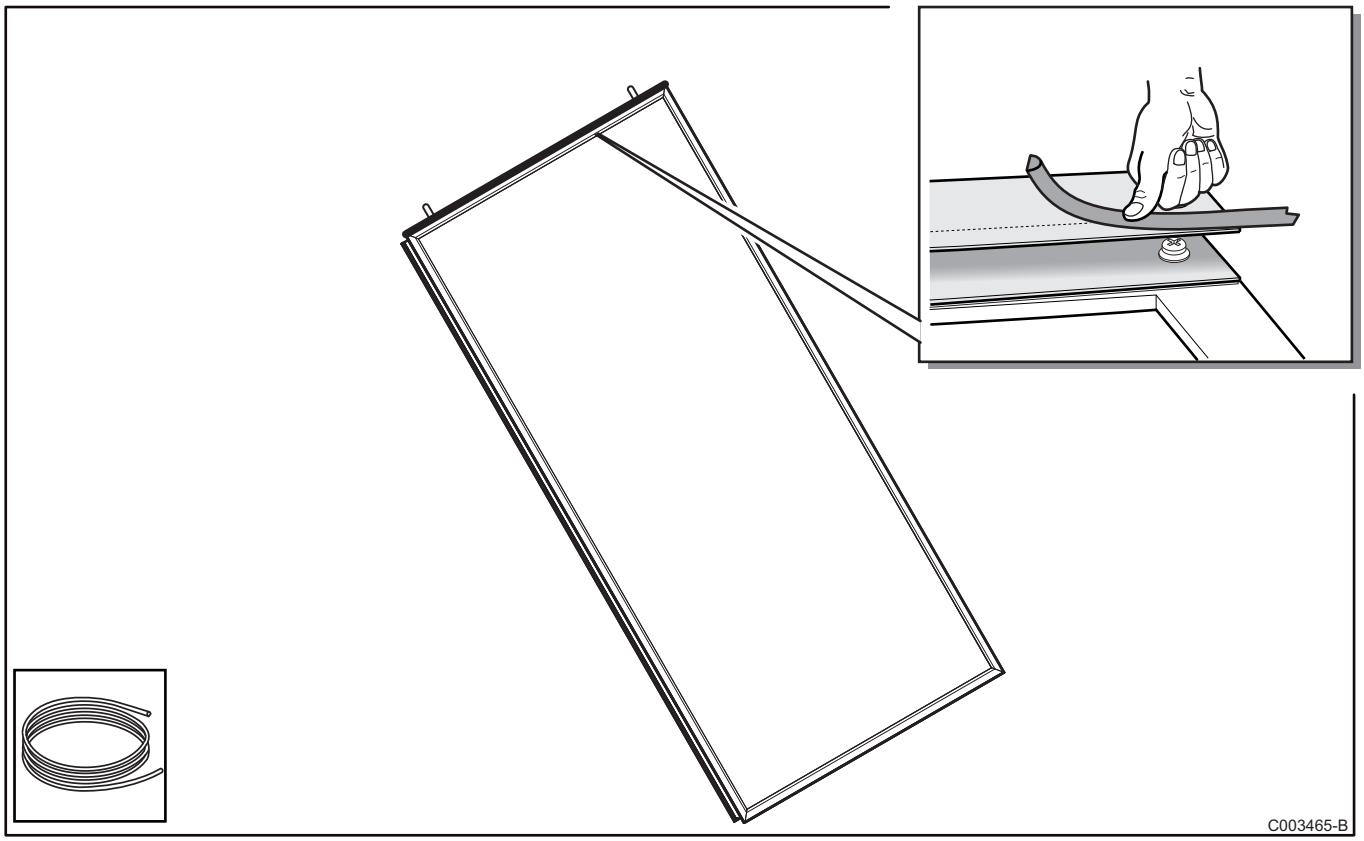
CAUTION

If the collectors are mounted with the flow and return connections at the bottom, reposition and tighten the fittings before putting the lower roofing plate in place.

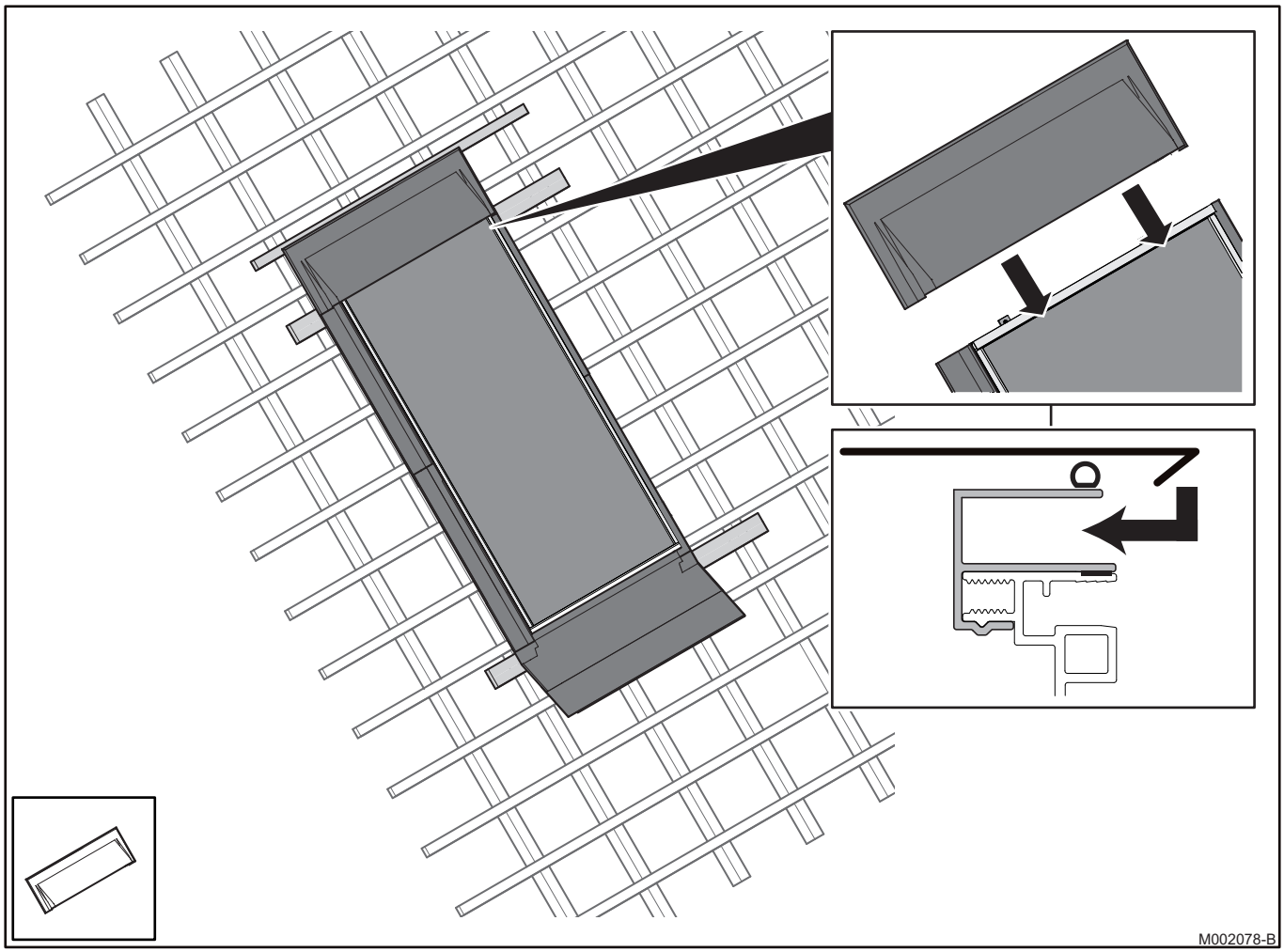
■ Mount the side roofing plates



■ Fitting the foam seal



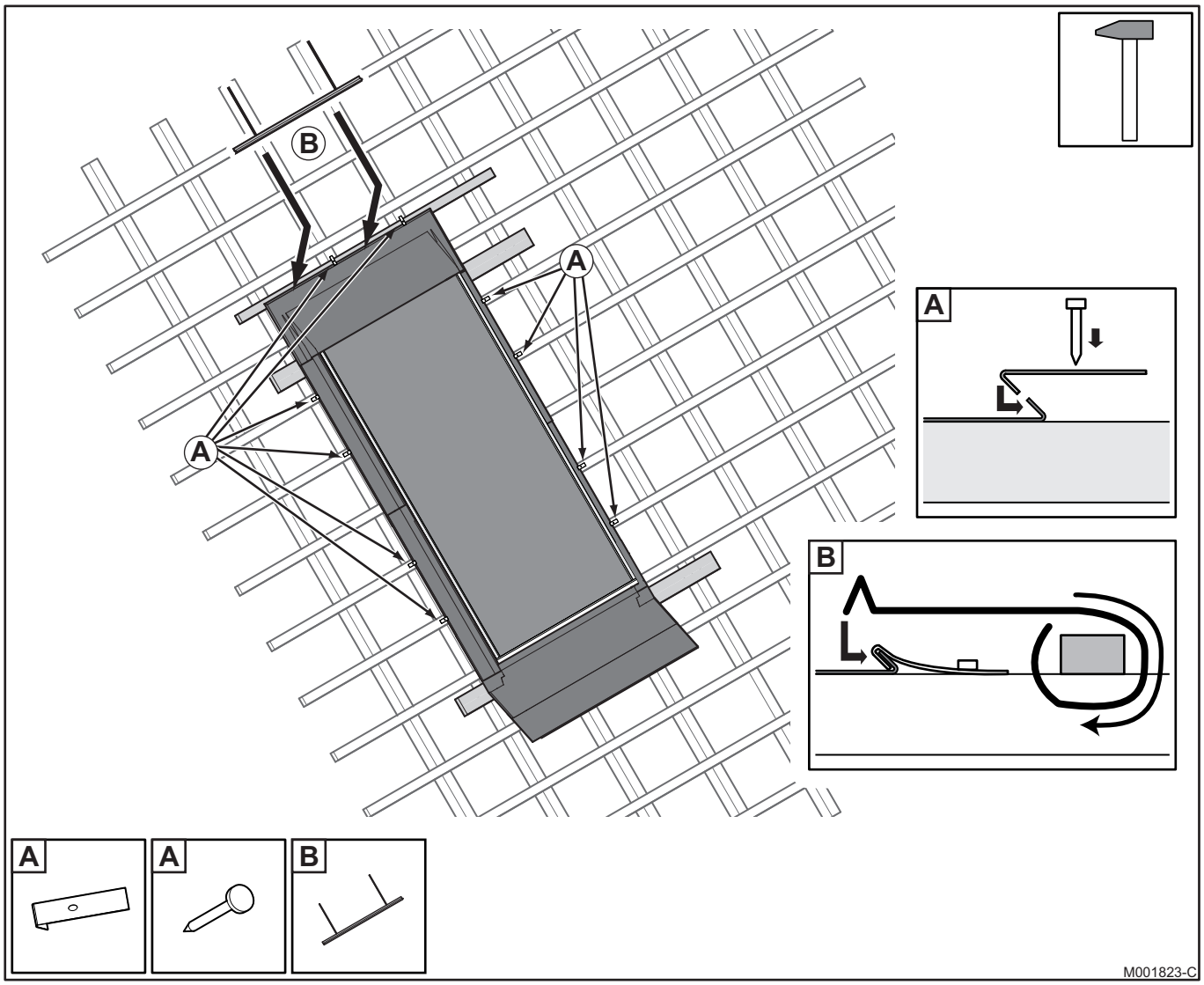
■ Mounting the upper roofing plate



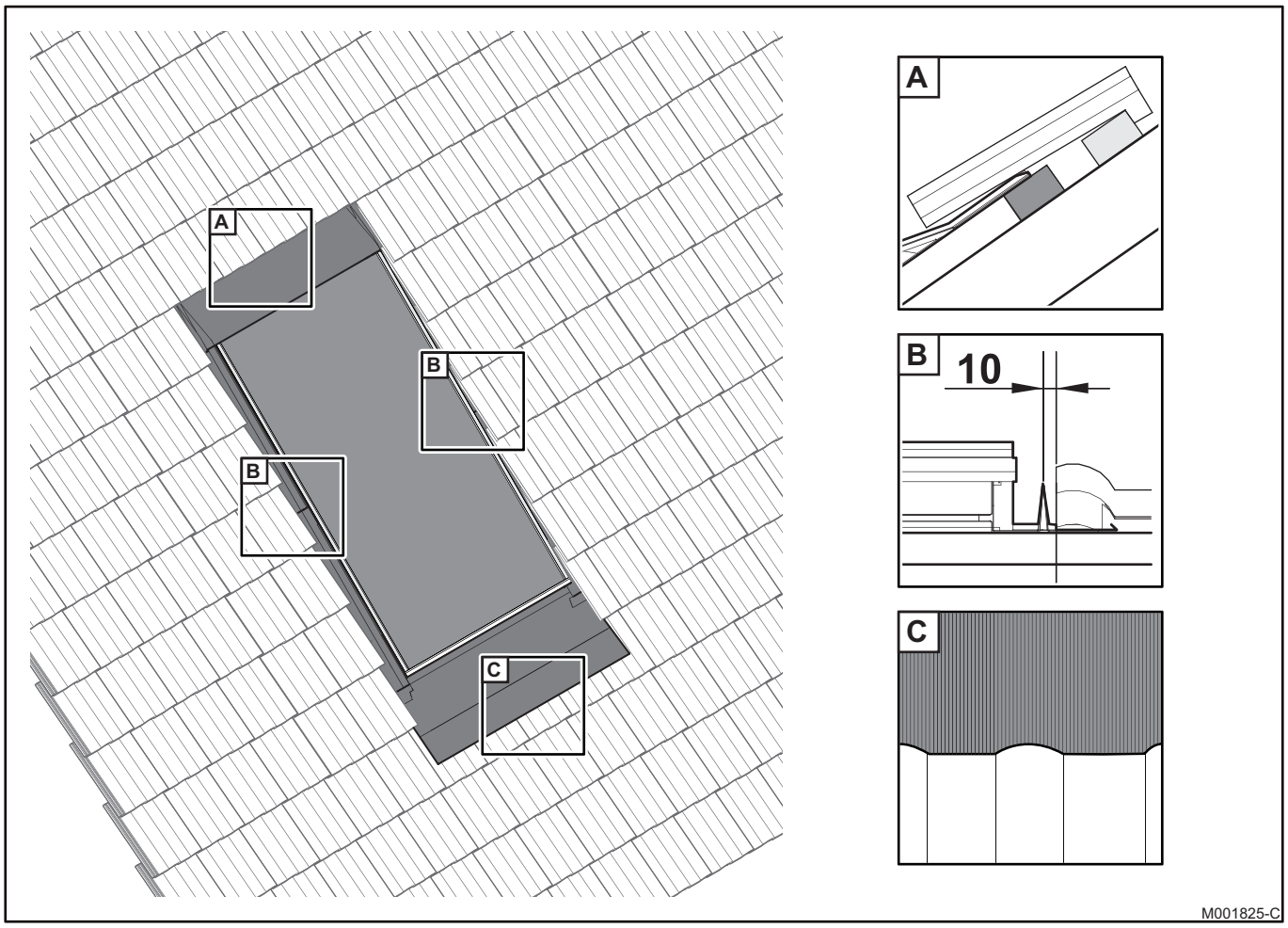
CAUTION

If the collectors are mounted with the flow and return connections at the top, reposition and tighten the fittings before putting the upper roofing plate in place.

■ Fitting the fastening lugs and the tile rests



■ Put the tiles in place



CAUTION

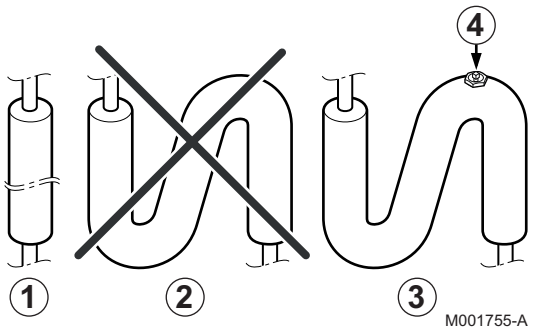
If the tip of the tile is resting on the side roofing plates, it is necessary to cut it to size to ensure that the tile is correctly fitted.

4.6 Hydraulic connections

4.6.1. Connection dimensions

Number of panels	Size (mm)	Maximum length (Outlet + Return)
2	14-15	40 m
3	14-15	40 m
4	16-18	40 m
5	16-18	40 m

To be able to have pipework without degassers or bleed valves at high points, the solar fluid flow rate must not fall below 0,4 m/s during the degassing procedure.
The pipes must be as short as possible and always sloping downwards between the collectors and the connection to the solar tank.
If the installation criteria for good degassing cannot be met, a manual bleed degasser ④ must always be installed at the high point(s) of the solar equipment.

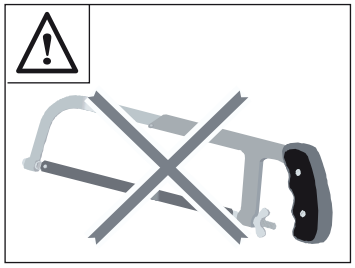


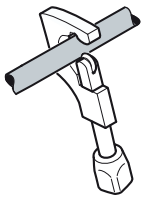
① Ideal
② Incorrect (high point with no air vent)
③ Correct (high point with air vent)
④ Location of manual bleed valve degasser

4.6.2. Connecting

CAUTION

Soft soldering are not authorized.
The use of flux promotes corrosion conditions in systems operating with propylene glycol as heat transfer fluid. In all cases the inside of the pipes must be flushed.



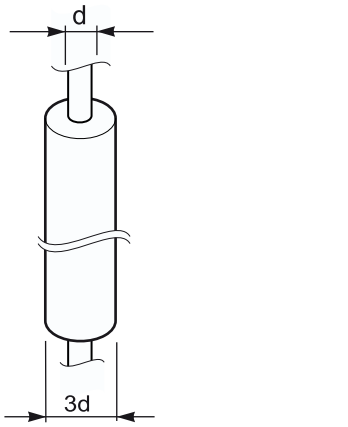

M001756-A

- Use of a hacksaw is prohibited.
- Pipe connections by compression unions.
- Hard soldering: Hard soldering: hard soldering filler metal without flux in accordance with DIN EN 1044, e.g. L-Ag2P or L-CuP6.
- Pipe unions: can only be used if they are resistant to glycol, pressure (6 bar) depending on version) and temperature (-30 °C, 180 °C) (manufacturer's data).
- Sealing material: Hemp.
- Press fitting (6 bar, 140 °C).

4.6.3. Pipe insulation

CAUTION

To protect the insulation against mechanical damage, bird pecking and UV light, add extra protection for the heat insulation sleeves in the roof area by using an aluminium sheet sleeve or aluminium adhesive tape. This additional protection must be sealed with silicone.



M001704-A

- If different copper pipes are used, the insulation must be:
  - Resistant to constant temperatures up to 150 °C in the collector zone and the hot outlet and also down to - 30 °C.
  - Insulation preferably waterproof and continuous.
  - with a thickness equal to the tube diameter and with a K coefficient of 0.04 W/mK.

50 % reduction of the insulation is permitted when passing through the roof and walls.

- Recommended materials for temperatures up to 150 °C:
  - Duo-Tube
  - DuoFlex
  - Armaflex HT
  - mineral wool
  - glass fibre

4.7 Filling the system

CAUTION

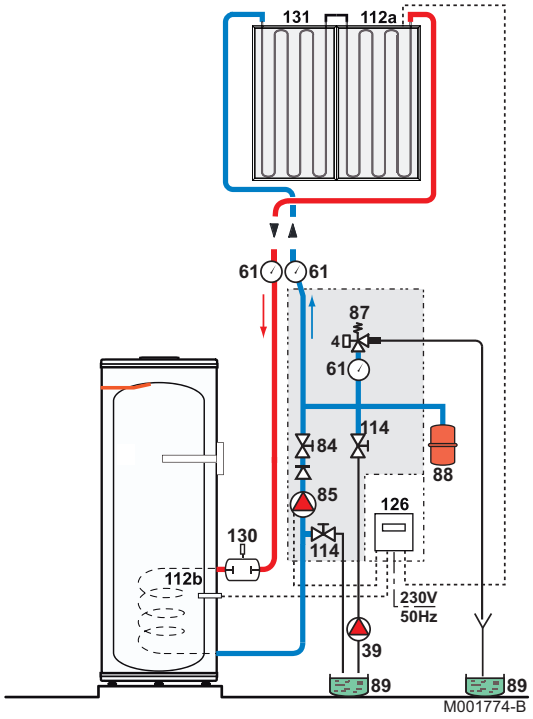
- Do not fill / rinse a hot solar collector. Risk of being burnt.
- Before the filling of the installation, to check the preload of the expansion vessel according to the static height (**Preload** = static Height/10 + 0.3 bar).
- check the connection to the series of collectors and the collector sensor connection.
- Since propylene glycol leaks much more easily than water, check all connections and gaskets for leaks after a few hours of operation at working pressure.

Following installation of the solar panels and hydraulic connection of the panels and piping, the system can undergo pressure tests and be filled. When doing so, the thermal conditions and the particular features of the installation must be taken into account. For that reason, the system may only be filled, commissioned and maintained by a **suitably authorised technician**.
Bring the pressure in the primary solar circuit up to the 2 bar working pressure by topping up if necessary with heat transfer fluid.

To prevent damage to the collectors and their connections by frost and corrosion, it is essential that a high quality heat transporting fluid be used to fill the solar installation. If the recommended ready-mixed fluid is used (Tyfocor L / LS) the system will be adequately protected at temperatures down to approx. -24 °C.

To prevent any damage of the system, **pressure tests** should only be carried out with the **heat-transporting fluid** used later on.

- Testing pressure: 4 bar
- Test time: **minimum 1 hour**



4	Pressure gauge
39	Filling pump
61	Thermometer
84	Stop valve with lockable nonreturn valve
85	Primary solar circuit pump
87	Sealed safety valve calibrated at 6 bar
88	Solar expansion vessel
89	Heat transfer fluid container
112b	Domestic hot water sensor
114	Primary solar circuit filling and draining device (⚠ propylene glycol)
126	Solar regulator
130	Manual bleed degasser
131	Array of collectors
132	Solar station complete with DIEMASOL solar regulation

5 Commissioning

5.1 Check points before commissioning

- Check the solar collectors and their fastenings.
- Fill the installation with water and check hydraulic tightness.
- Check the pressure of the installation.
- Check the electrical connections, particularly the earth.
- Check that the sensors are correctly positioned.
- Check that the sensors are operating correctly.
- Check and ensure that the sensor and 230 V cables are separated.

5.2 Commissioning

Regarding the start-up of the solar circuit, refer to the respective instructions for the solar DHW tank or the control system.

6 Checking and maintenance

6.1 General instructions

CAUTION

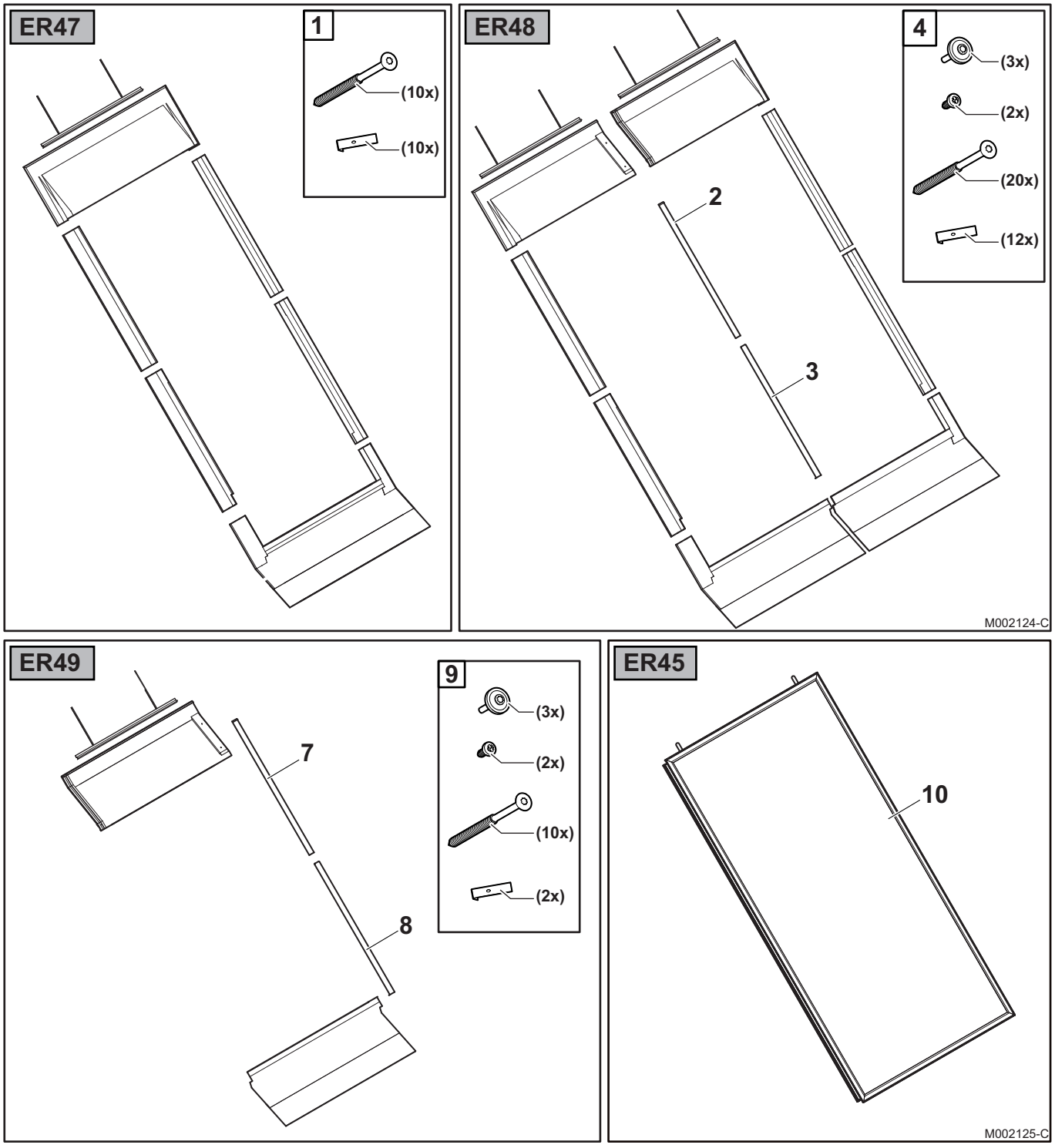
- Maintenance operations must be done by a qualified engineer.
- An annual inspection is compulsory.
- Only original spare parts must be used.
- Protection of the environment: Place a container of sufficient volume under the drain pipe and the valve discharge pipe.

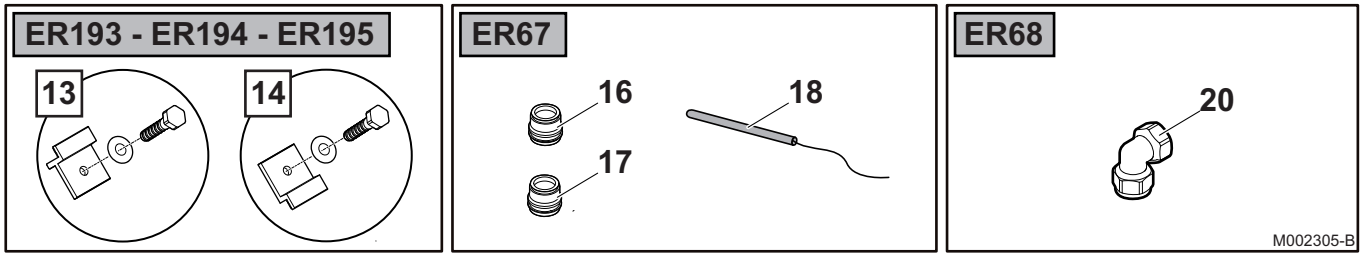
- Check the solar collectors and their fastenings.
- Check that there are no leaks on the hydraulic connections.
- The hydraulic pressure must be a minimum of 2 bars
- Check that the sensors are operating correctly.
- Check the safety devices (particularly the valve or safety unit), referring to the instructions provided with these components.
- Check the antifreeze power of the heat transporting fluid (Minimum -20 °C).
- Check the pH of the heat transporting fluid; it should be between 7 and 8.
- Clean the surface of the solar collectors using a soft, damp cloth.
- Check that the gaskets and connections are in good condition.
- Check that the insulation is in good condition (no mechanical deterioration or damage caused by the pecking of birds or UV).

7 Spare parts

7.1 Spare parts

Spare parts list reference: 300021356-002-C





Markers	Reference	Description
		ER 47
1	200017411	Screws
		ER 48
2	200016005	Top tie plate NEO collector
3	200016004	Bottom tie plate NEO collector
4	200017412	Screws
		ER 49
7	200016005	Top tie plate NEO collector
8	200016004	Bottom tie plate NEO collector
9	200017413	Screws
		ER 45
10	100013470	Collector - NEO 2.1
		ER 193 - ER 194 - ER 195
13	200017620	Bottom retaining lugs
14	200017621	Top retaining lugs
		ER 67
16	300021241	Reduction 18/15
17	300021242	Reduction 18/16
18	300021243	PT 1000 sensor
		ER 68
20	300002002	12 x 12 cleat fitting

30/11/2011

300021356-001-F

DDTH - 57, rue de la Gare
F - 67580 MERTZWILLER