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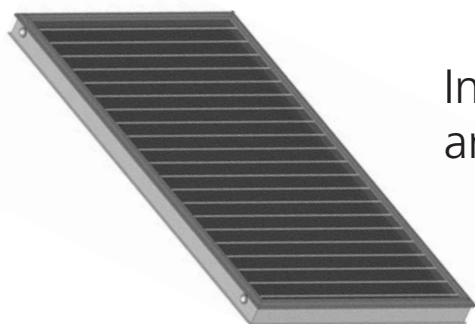
# Solar Package

Solarcollectors

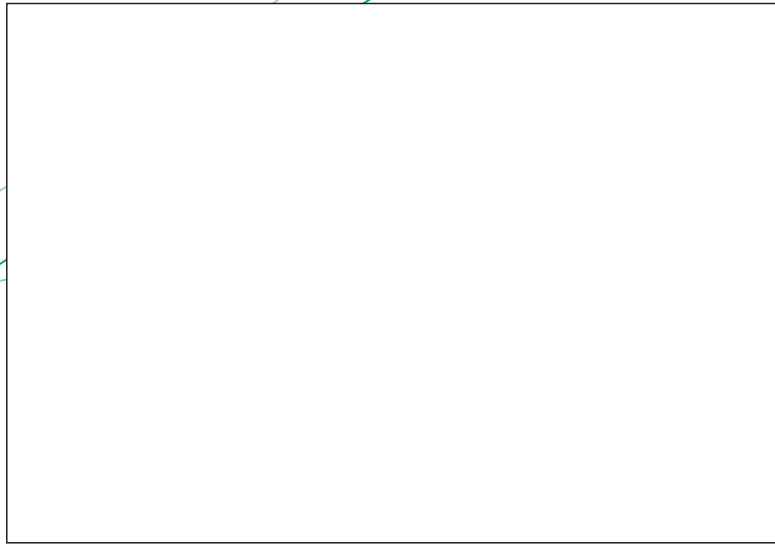
**SPBI / SPBO / SPFR**



0309 770



Installation, User, Service Manual  
and Parts Overview



**your installer**

This manual consists of 2 parts.

Part 1 - Installation-, user- and servicemanual.

Part 2 - Parts overview.



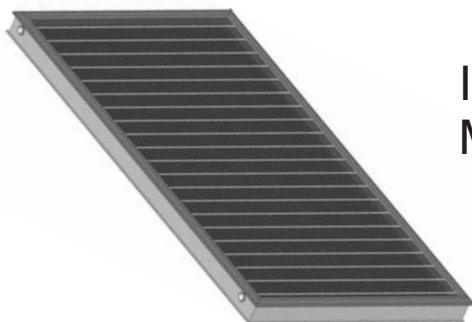
# Solar Package

Solarcollectors

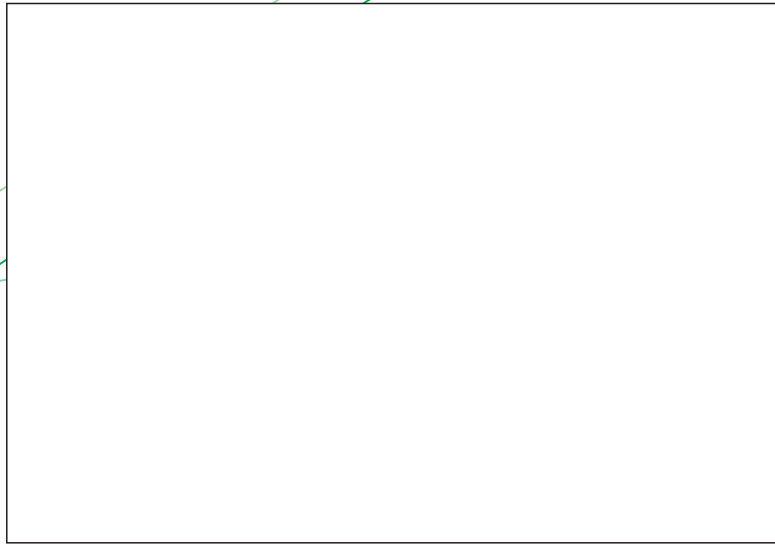
**SPBI / SPBO / SPFR**



0309 025



Installation, User and Service  
Manual



**your installer**

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**Carefully read this manual**



**Warning**

Carefully read this manual before starting up the device. Not reading this manual and not following the instructions in this manual may lead to personal injuries and damage to the device.

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Although utmost care has been taken in ensuring a correct and, where necessary, complete description of the relevant parts, the manual may contain faults and obscurities.

Should you still discover faults or obscurities, please inform us about this. It helps us to further improve the documentation.

**Additional information**

If you have any remarks or questions concerning specific subjects related to the device, please do not hesitate to contact. A.O. Smith Water Products Company  
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For problems with respect to connections to gas, electricity and water supplies, please contact the supplier/installation engineer of your installation.



# Table of contents

|           |   |           |
|-----------|---|-----------|
| <b>1</b>  | <b>Notes and remarks .....</b>                                    | <b>7</b>  |
| <b>2</b>  | <b>Collector dimensions .....</b>                                 | <b>9</b>  |
| <b>3</b>  | <b>Roof build on consoles - collector field arrangement .....</b> | <b>11</b> |
| 3.1       | Base console / Concrete blocks .....                              | 12        |
| 3.2       | Base console .....  | 14        |
| <b>4</b>  | <b>Dimensions collector field roof build on .....</b>             | <b>15</b> |
| 4.1       | Spacing single-row collector field .....                          | 15        |
| 4.2       | Spacing multi-row collector fields .....                          | 17        |
| <b>5</b>  | <b>Assembly roof build on .....</b>                               | <b>19</b> |
| 5.1       | Assembly roof-tile clamps .....                                   | 19        |
| 5.2       | Assembly roof-tile clamps without lead .....                      | 20        |
| 5.3       | Assembly roof-tile clamps with lead .....                         | 21        |
| 5.4       | Assembly plain tile clamps without lead .....                     | 23        |
| 5.5       | Assembly plain tile clamps with lead .....                        | 24        |
| 5.6       | Roof clamps corrugated iron roof .....                            | 26        |
| <b>6</b>  | <b>Assembly aluminium profiles .....</b>                          | <b>27</b> |
| <b>7</b>  | <b>Assembly collectors .....</b>                                  | <b>29</b> |
| <b>8</b>  | <b>Roof build in collector field arrangement .....</b>            | <b>31</b> |
| 8.1       | Re-roofing of the tiles and collector .....                       | 32        |
| <b>9</b>  | <b>Mounting instructions collector sheet covers .....</b>         | <b>35</b> |
| 9.1       | Preparations before mounting .....                                | 35        |
| 9.2       | Bottom sheet left (1) .....                                       | 36        |
| 9.3       | Bottom sheet- center .....  | 37        |
| 9.4       | Vertical sheet left – vertical sheet right .....                  | 37        |
| 9.5       | Connection sheet top (7) and bottom (8) .....                     | 38        |
| 9.6       | Preparations before mounting .....                                | 39        |
| 9.7       | Top sheet-left .....  | 40        |
| 9.8       | Top sheet middle .....  | 40        |
| 9.9       | Top sheet-right .....   | 40        |
| 9.10      | Top sheet connector .....   | 41        |
| 9.11      | Mounting the top sheets .....                                     | 41        |
| 9.12      | Silicon kit sealing .....   | 42        |
| 9.13      | Applying the lead-skirt on the roof tiles .....                   | 42        |
| <b>10</b> | <b>Collector connectors .....</b>                                 | <b>43</b> |
| <b>11</b> | <b>Collector connections .....</b>                                | <b>45</b> |
| <b>12</b> | <b>Collector assembly completion .....</b>                        | <b>47</b> |
| <b>13</b> | <b>Hydraulic connections .....</b>                                | <b>49</b> |
| 13.1      | Hydraulic connections with collecting pipe .....                  | 50        |
| 13.2      | Overview hydraulic connections .....                              | 51        |

## Table of contents

|           |   |           |
|-----------|---|-----------|
| <b>14</b> | <b>Drainback system accessory .....</b> | <b>53</b> |
| 14.1      | General Safety Information.....         | 53        |
| 14.2      | Sizing of the drainback modules.....    | 55        |
| 14.3      | Roof integrated installations .....     | 56        |
| 14.4      | Mounting instructions.....              | 56        |
| 14.5      | On-roof mounting installations.....     | 57        |
| 14.6      | Mounting instructions.....              | 58        |
| 14.7      | Console mounting on at roofs.....       | 59        |
| 14.8      | Mounting instructions.....              | 60        |
| 14.9      | Important .....                         | 61        |
| <b>15</b> | <b>Warranty (certificate).....</b>      | <b>63</b> |
| 15.1      | Warranty general .....                  | 63        |
| 15.2      | Conditions of installation and use..... | 63        |
| 15.3      | Exclusions .....                        | 63        |
| 15.4      | Extent of the warranty.....             | 63        |
| 15.5      | Claims.....                             | 63        |
| 15.6      | Obligations of A.O. Smith .....         | 64        |

# 1 Notes and remarks

## Responsibilities:

The manufacturer:  
of the installation is responsible for the integration of the installation according to regulations and for compliance with the safety regulations.

The operator:  
of the installation is responsible for an operation of the installation according to regulations and for consultation of experts in case of problems.

## Concerning manufacture and operation of the installation the following guidelines and regulations are valid (amongst others):

- accident prevention regulations
- guidelines and regulations of professional associations
- regulations of suppliers of assembly parts



### Remark

- The collectors may never be operated or tested under pressure with water.
  - Being very careful it is possible to walk onto the collectors, however, the seals must not be loaded by that.
- 

## For transport and stocking of the collectors the following regulations are valid:

- Never abandon the delivered collectors unprotected at the building site.
- Never lay down the collectors onto a rough surface with overhanging pieces like stones, timbers, etc.
- Stock the collectors always upright leaning against a solid surface.
- The rigidity of the collectors is limited. During transport to the building site always ensure a torsion-free transport type.
- In case of an elevated intermediate storage make sure that the collectors are protected against sliding down.
- Regulations and instructions of transporters in charge have to be observed.

## Maintenance:

Service intervals are to be specified system-dependent. An optical check of all system components is recommended once a year. Adequate function of the system must be checked once a year.

## Lightning protection:

The regulations concerning lightning protection have to be observed strictly. In case of doubt an expert or the office in charge must be contacted.

This instruction is not subjected to the control of a service of modifications. It does not absolve the manufacturer and operator of the installation of its responsibility to install and operate all parts of the installation according to utmost professional knowledge.

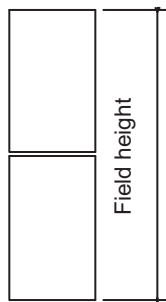
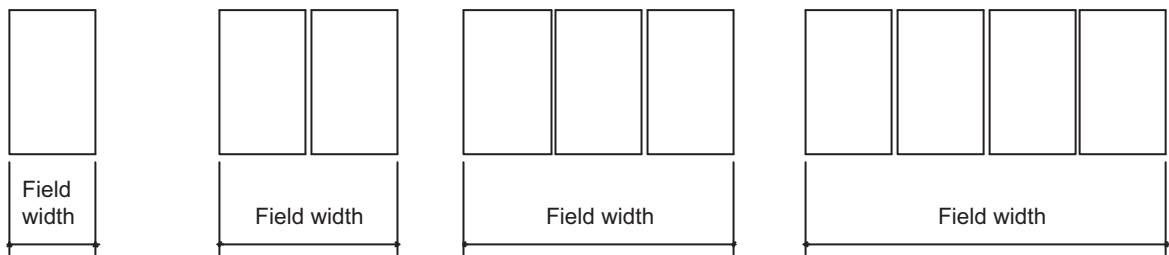
The manufacturer of the installation is responsible to observe and keep all appropriate regulations and instructions. The copyright of this instruction including graphical material remains in any case at the manufacturer. The instruction can only be duplicated completely or in parts with written authorization of the manufacturer.



## 2 Collector dimensions

| Collector data: | Collector type       | Width | Height | Thickness | Weight | Fluid content |
|-----------------|----------------------|-------|--------|-----------|--------|---------------|
|                 | vertical collector   | 116.7 | 206.7  | 11        | 44 kg  | 2.2 L         |
|                 | horizontal collector | 206.7 | 116.7  | 11        | 44 kg  | 2.3 L         |

### Vertical collectors



| Field width        |                      |       |       |       |       |                               |
|--------------------|----------------------|-------|-------|-------|-------|-------------------------------|
|                    | Number of collectors |       |       |       |       | per each additional collector |
| vertical collector | 1                    | 2     | 3     | 4     | 5     |                               |
|                    | 116.7                | 238.7 | 360.7 | 482.7 | 604.7 | +122                          |

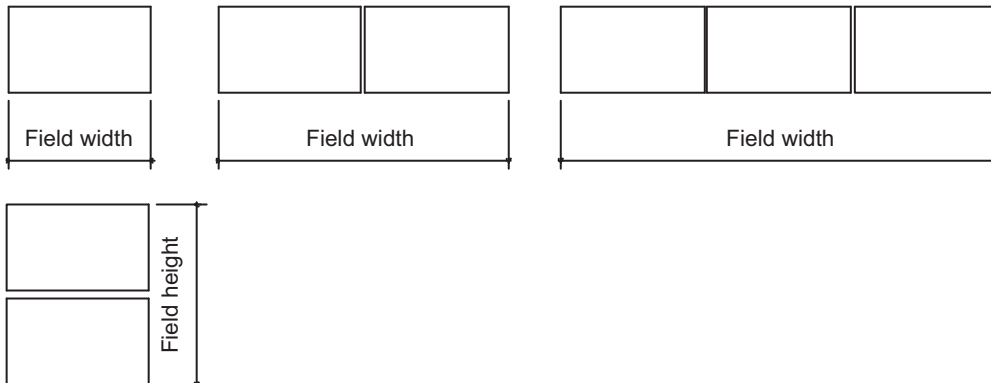
| Field height         |                    |       |
|----------------------|--------------------|-------|
| Number of collectors | vertical collector |       |
|                      | 1                  | 206.7 |
|                      | 2                  | 413.4 |

All measures in cm

# 2

## Collector dimensions

### Horizontal collectors



| Field width          |                      |       |       |       |                               |
|----------------------|----------------------|-------|-------|-------|-------------------------------|
|                      | Number of collectors |       |       |       | per each additional collector |
|                      | 1                    | 2     | 3     | 4     |                               |
| horizontal collector | 206.7                | 418.7 | 630.7 | 842.7 | +212                          |

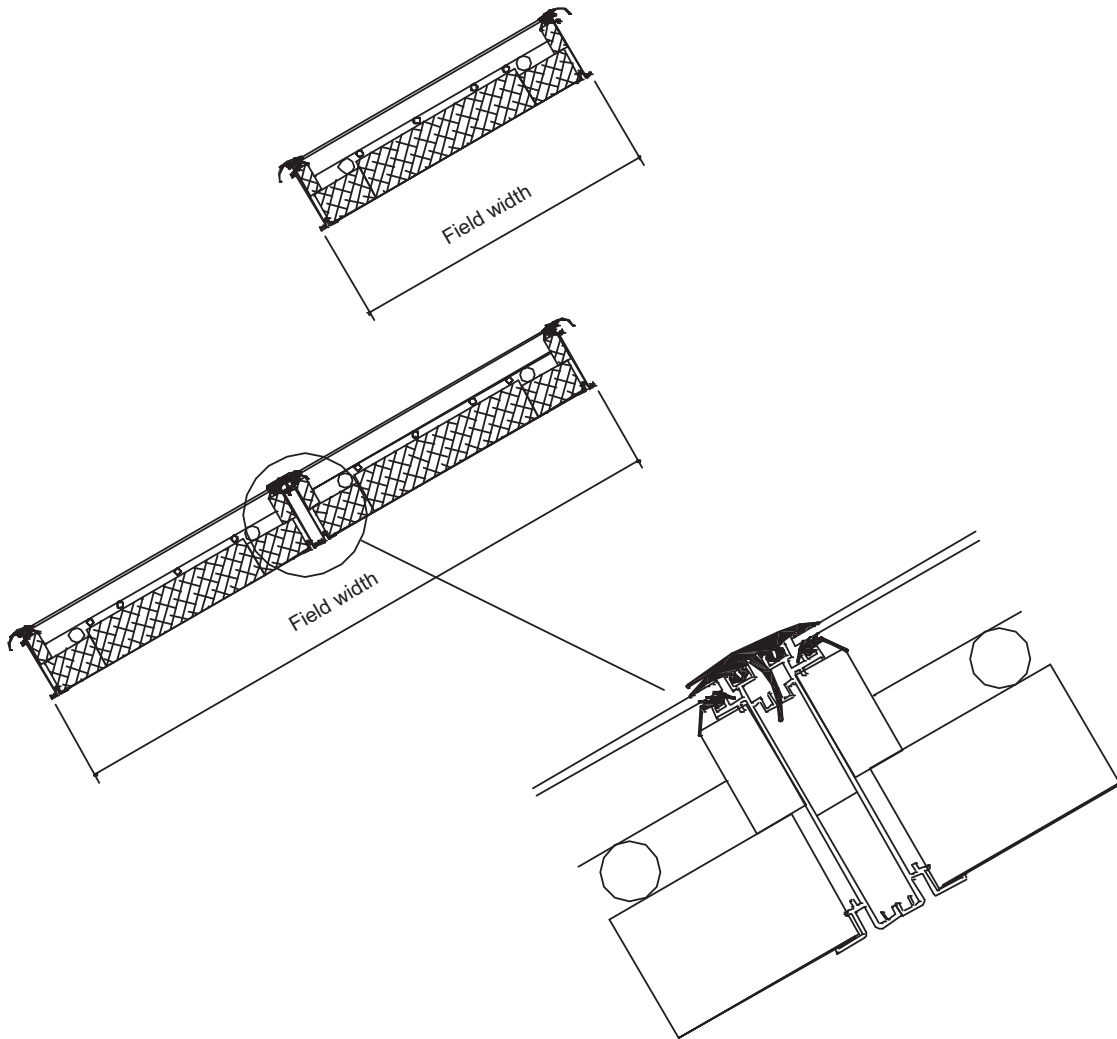
| Field height         |                      |       |
|----------------------|----------------------|-------|
|                      | Number of collectors |       |
|                      | 1                    | 2     |
| horizontal collector | 116.7                | 233.4 |

All measures in cm

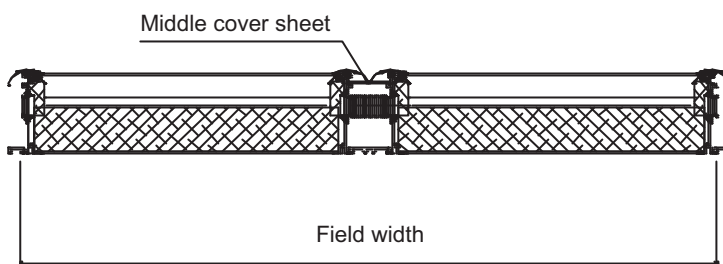


### 3 Roof build on consoles- collector field arrangement

*Vertical section across a collector field*



*Horizontal section across a collector field*

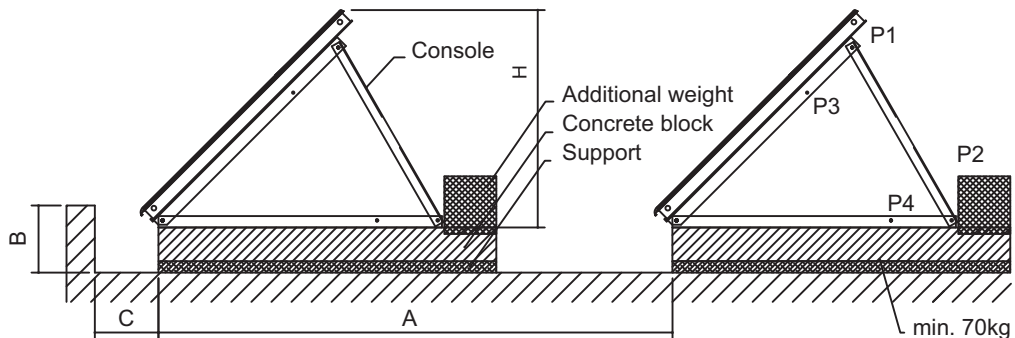


# 3

## Roof build on consoles-collector field arrangement



### 3.1 Base console / Concrete blocks Construction of solar collectors



| Row distance of solar collectors |            |       |       |       |
|----------------------------------|------------|-------|-------|-------|
| Collector type                   | Distance A |       |       |       |
|                                  | 20°        | 30°   | 45°   | 60°   |
| horizontal collector             | 270cm      | 310cm | 320cm | 330cm |

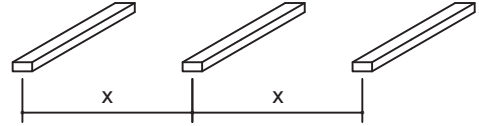
| Assembly height of collectors |          |       |       |        |
|-------------------------------|----------|-------|-------|--------|
| Collector type                | Height H |       |       |        |
|                               | 20°      | 30°   | 45°   | 60°    |
| horizontal collector          | 53 cm    | 71 cm | 93 cm | 110 cm |

| Distance of consoles |            |
|----------------------|------------|
| Height balustrade B  | Distance C |
| 30 cm                | 20 cm      |
| 40 cm                | 40 cm      |
| 50 cm                | 70 cm      |
| 60 cm                | 100 cm     |
| 70 cm                | 125 cm     |
| 80 cm                | 150 cm     |
| 90 cm                | 180 cm     |
| 100 cm               | 205 cm     |
| 110 cm               | 230 cm     |

| Position crossbar |          |
|-------------------|----------|
| Angle             | Position |
| short traverse    |          |
| 20°               | P1-P2    |
| 30°               | P3-P4    |
| long traverse     |          |
| 45°               | P1-P2    |
| 60°               | P3-P4    |

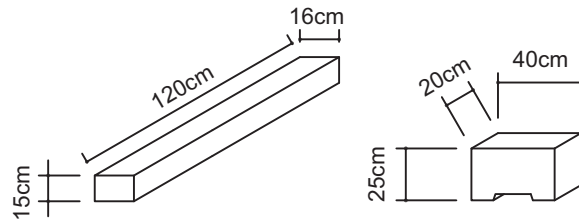


The height of the concrete blocks (15 + 3 cm) must be added for the total height.



| Distance of the blocks (centre- |            |
|---------------------------------|------------|
| Collector type                  | Distance X |
| horizontal collector            | 212 cm     |

In case of construction of solar collectors you have to be careful that the consoles are fixed either onto a solid ground or onto the concrete blocks drawn in these instructions. The weights indicated by us are sufficient for locations up to 800 m above sea level with no extreme wind disposition. In case of locations that are higher or exposed to extreme wind speeds the weights have to be raised and, if necessary, additional safety measures have to be taken. If the consoles are fixed onto building parts you have to make sure that the impermeability is guaranteed in any case.



|                           |        |
|---------------------------|--------|
| Weight concrete block     | 70 kg  |
| Additional weight         | 45 kg  |
| Console                   | 8 kg   |
| Collector                 | 50 kg  |
| Total weight construction | 178 kg |



#### Remark

- To prevent any damage of the installation, the manufacturer recommends to always fix the collector consoles directly to solid ground.
- The manufacturer will not take any responsibility, nor will accept any cost of damage to the installation that might occur because of excessive wind-speeds.

# 3

## Roof build on consoles-collector field arrangement



### 3.2 Base console



Base console for construction of the collectors onto different grounds e.g. concrete blocks, concrete console with additional weight, constructions of the building contractor etc. When setting up the console adjust positioning angle according to the table on page 12.



Fastening cut in base console for mounting of the collectors



Collector mounting with double fastening plate (screw M8x25 and nut). Fastening plates between two collectors clamp one collector on each side and there for determine the distance between the collectors



**Before installing the second collector take note of the collector connector on page 43!**



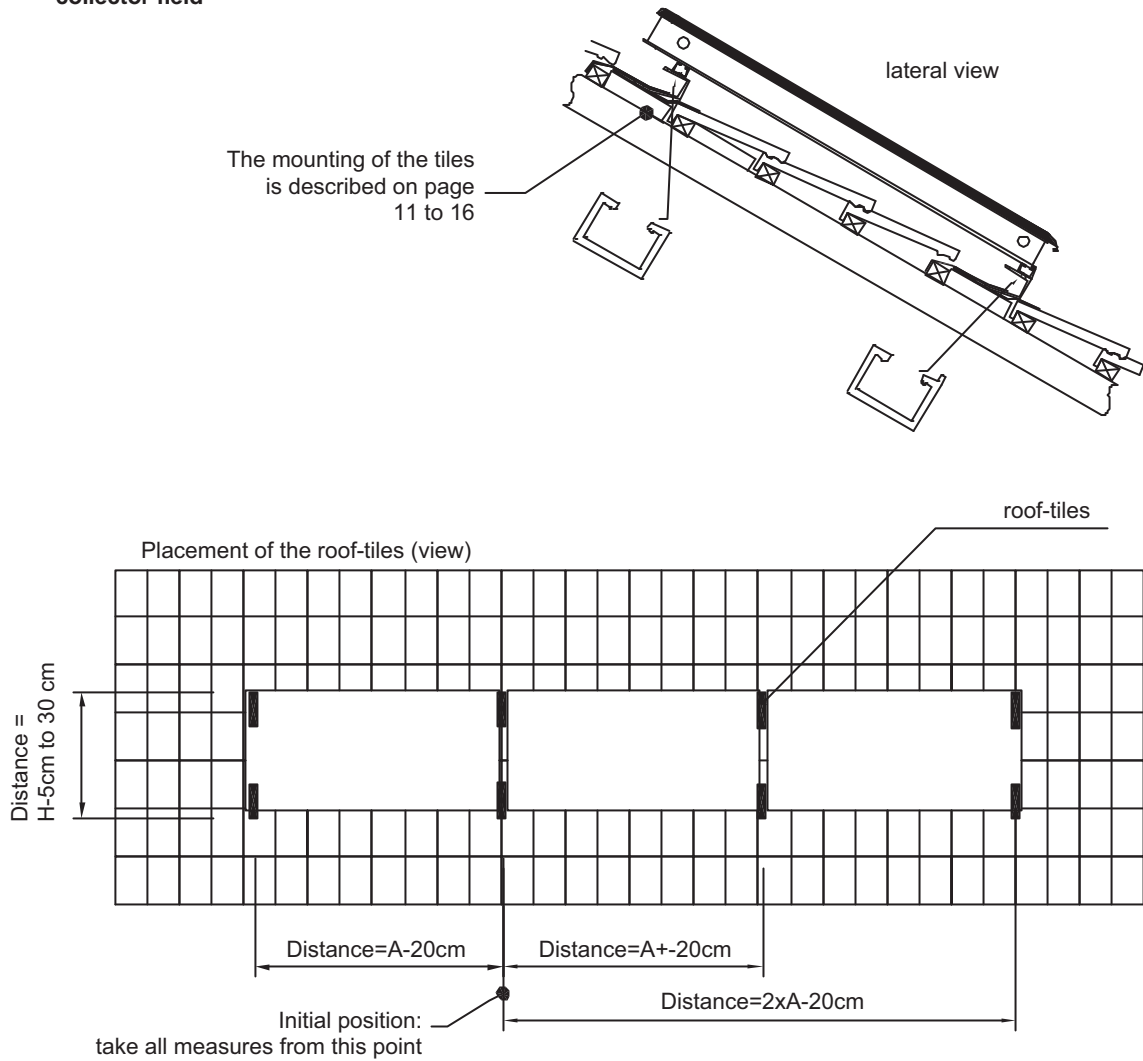
Collector mounting with single fastening plate is used on the right or left edge of a collector field.



# 4 Dimensions collector field -roof build on

## 4.1 Spacing single-row collector field

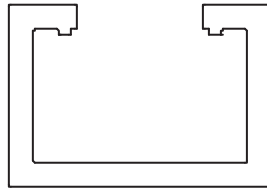
Installation onto roof-tiles



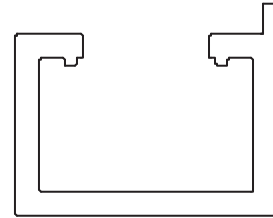
| Collector type | horizontal collector | vertical collector |
|----------------|----------------------|--------------------|
| Measure A      | 212 cm               | 122 cm             |
| Measure H      | 116 cm               | 206 cm             |



After the mounting of the roof-tiles the aluminium profiles are fixed onto them horizontally. The „Profiles below“ are fixed onto the lowest row roof-tiles. The „Profiles standard“ are fixed onto the roof-tiles lying on top of them (therefore have a look at page 27). Make sure that the profiles are laterally exactly aligned. After the mounting of the profiles you can start with the assembly of the collectors.



Fastening profile standard

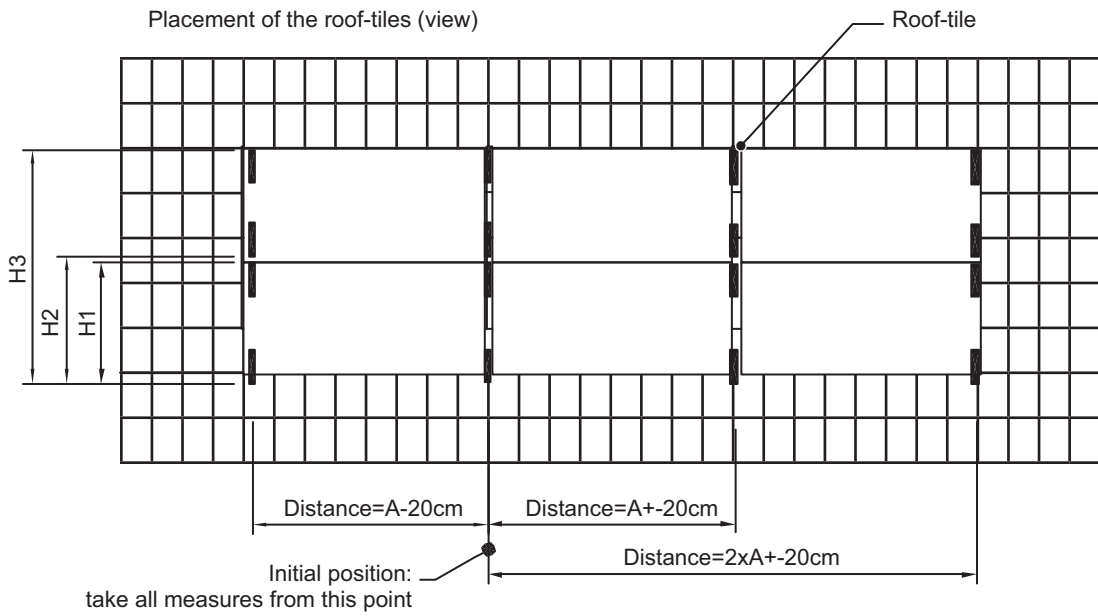


Fastening profile below



**4.2 Spacing multi-row collector fields**

*Installation onto roof-tiles multi-row*

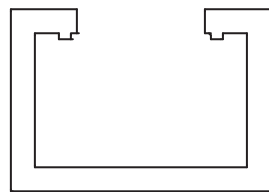
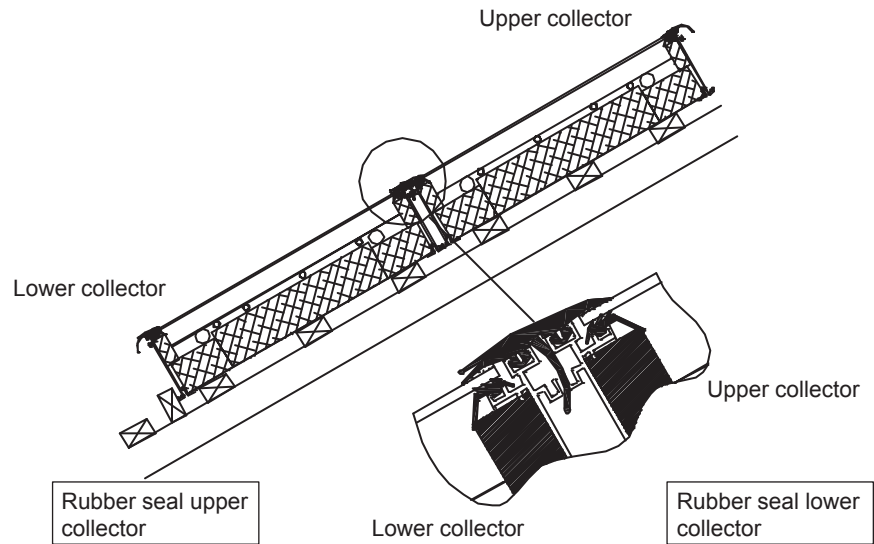


| Collector type     |                      |                    |
|--------------------|----------------------|--------------------|
| Horizontal measure | horizontal collector | vertical collector |
| Measure A          | 212 cm               | 122 cm             |

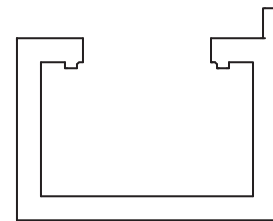
| Collector type   |                      |                    |
|------------------|----------------------|--------------------|
| Vertical measure | horizontal collector | vertical collector |
| Measure H1       | 112-87 cm            | 202-177 cm         |
| Measure H2       | 127-152 cm           | 217-237 cm         |
| Measure H3       | 224-204 cm           | 404-384 cm         |
| Measure H4       | 244-264 cm           | 424-444 cm         |
| Measure H5       | 341-321 cm           | 611-591 cm         |



After the mounting of the roof-tiles the aluminium pro les are xed onto them horizontally. The „Pro les below“ are xed onto the lowest row roof-tiles. The „Pro les standard“ are xed onto the roof-tiles lying on top of them (therefore have a look at page 27).



Fastening profile standard



Fastening profile below



# 5 Assembly roof build on

## 5.1 Assembly roof-tile clamps



Removal of the tiles after previous determination of the placement of the roof tile clamps according to the sheet „Installation onto roof-tiles“.



Fixation of the lower lath 24x80x600 with two screws 4 x 50 mm.

If the lath is placed in the region of a counter lath the lath 24x80x600 must not be applied.



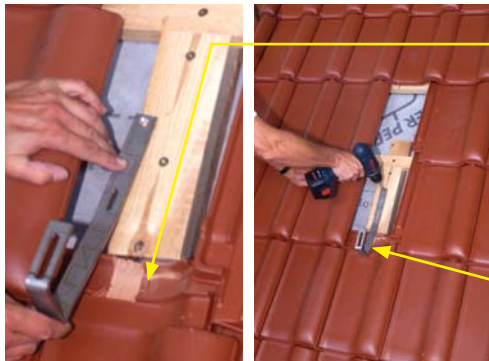
Mounting of the tile clamp support: Lath 24x150x270 with two screws 6 x 60 mm-see also page 21.



Apply this lath also if the counter lath serves as support.



## 5.2 Assembly roof-tile clamps without lead



Grind the tile coarsely: the tile clamp may not rest on the tile.

Adjustment and fixation of the tile clamp: The tile clamp must be mounted in the non-corrugated area of the tile.

The tile clamp may not rest on the tile.



Clamp tile completely mounted before re-roofing.



Grinding of the cover tile and re-roofing of the remaining tiles.



Tile clamp with re-roofed tiles. Attention: All further tile clamps in one row must be adjusted exactly (e.g. by a line mark).



### 5.3 Assembly roof-tile clamps with lead



Mount the lower lath 24x80x600 as described on page 19.

Fixation of the tile clamp support 24x150x270 with two screws 6x60 mm.



Place the first lead sheet in such a way that the lower tile is covered and that the sheet lies below the tiles on both sides (bend up the lead sheet laterally).



Mount the tile clamp in such a way that the lower tile is not overlapped. The tile clamp may not cover the lower tile because otherwise a pressure point would arise on the lower tile.



Mounting of the upper lead sheet. Bend up the sheet also laterally. The screws of the tile clamp must be covered. Protect the lead against slipping.

# 5

## Assembly roof build on



The added foam wedge is placed under the adjacent tiles on both sides as well as above (protection against splash water and snow)

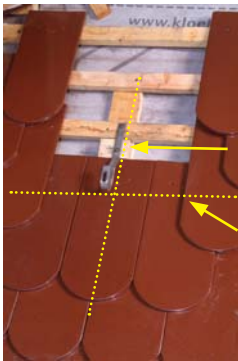


Completely mounted tile clamp.

Attention: All further tile clamps in one row must be adjusted exactly (e.g. by a line mark)



#### 5.4 Assembly plain tile clamps without lead



Mounting of the laths as described on page 19.  
Laterally adjustment in such a way that only one tile has to be grinded.

Adjust the tiles in the height so that there is enough space for the cover tile. Fixation of the tile clamp with two screws 5 x 60 mm.

The tile clamp may not rest on the tile resp. cause pressure points onto the tile.



If the tile clamp is mounted too low the added 5mm lumbers can be placed under the tile clamp. Re-roofing of the tiles.



Grinding of the tile and reproofing.



Covering of the remaining tiles.

Attention: All tile clamps in an horizontal row must be adjusted exactly (e.g. by a line mark)

# 5

## Assembly roof build on



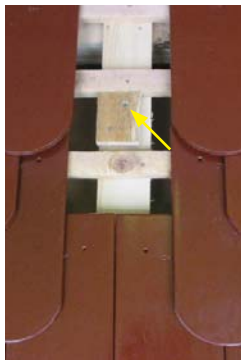
### 5.5 Assembly plain tile clamps with lead



Roof before untiling. After untiling the lath 24x80x600 must firstly be mounted under the tile lath (see page 20 photo 2+3)



Tile clamp with lower lead sheet completely mounted.



Untiling of the tiles for the assembly of the tile clamps. Mounting of the upper tile clamp support with two screws 5x60.



The tile clamp must have a minimum distance to the underlying tile of 5mm. Distance of tile clamp 5mm



Mounting of the lower tile clamp support with screw 5x60.

Lumber excess length 5mm (Lumber is higher than tile)



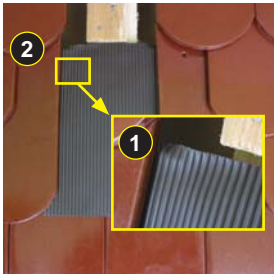
Mounting of the upper lead sheet. The lead is placed laterally under the tiles.



Completely mounted support lumbars.



Upper lead sheet mounted.



(1) Bend the corners on both sides down.

(2) Mounting of the lower lead sheet. The lead is placed laterally under the tiles.



Covering of the upper tiles.



Fixation of the tile clamp with screw 5x60. Lower screw in tile lath, upper screw in tile clamp support.



View of a readily mounted tile clamp. All further tile clamps must be adjusted exactly, see also page 22 last photo.



### 5.6 Roof clamps corrugated iron roof



The placing of the roof clamps corrugated iron roof is determined according to page 19. Pay attention that the roof clamps are placed in the area of an existing mounting lath. The angle for the fixation of the aluminium profiles must always be below.

Sealing edge



The holes for the fixation screws have to be predrilled with an 8mm borer.

The fixation is realized by a façade screw 6.5x100 with sealing gasket.



Roof clamp completely mounted and ready for the assembly of the fastening profiles, therefore see also page 29.

If the roof clamps cannot be mounted within the limits indicated on page 17, you first have to mount horizontal or vertical C-profiles onto the roof clamps. Afterwards the added fastening profiles are mounted.



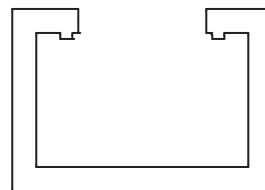
## 6 Assembly aluminium profiles



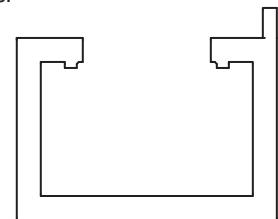
Readily mounted tile clamps for one collector field with two collectors.



Assembly of the aluminium profiles.



Fastening profile standard



Fastening profile below



The mounting is effected with the added cylinder head screws M8 x 25 and the stop nut.

In case of tile clamps without connecting profile the 3mm supports are placed between tile clamp and aluminium profile.

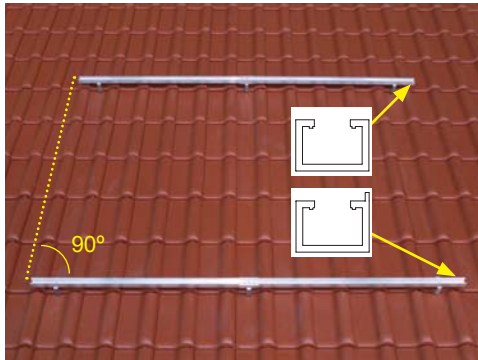


The connecting profile is connected with the profiles by two additional cylinder head screws M8 x 25.

Without 3mm support because connecting profile is placed onto tile clamp.

# 6

## Assembly aluminium profiles



Completely mounted aluminium profiles ready for the assembly of the collectors.

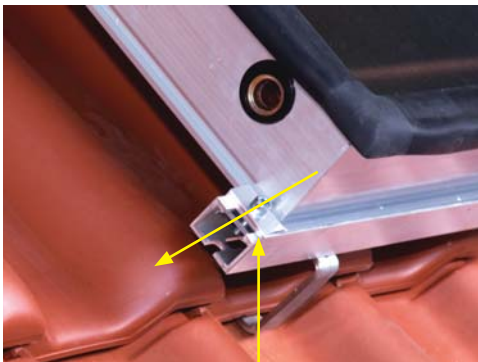
Pay attention that the profiles are exactly adjusted and the beginning of the upper profile is adjusted rectangularly to the lower profile.



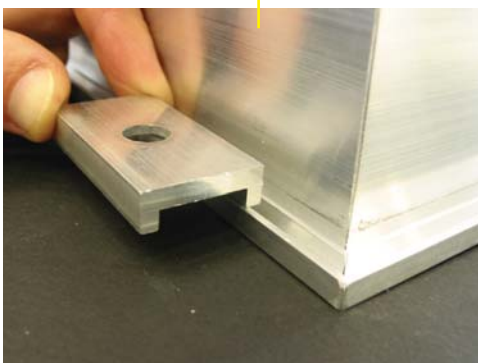
## 7 Assembly collectors



Placing of the first collector (collector on the left).



Mount the collector with the help of the fastening plate on the left side. Afterwards the two collector connectors are mounted.



**Before installation of the second collector, pay attention to page 43 Collector connection!**

# 7

## Assembly collectors

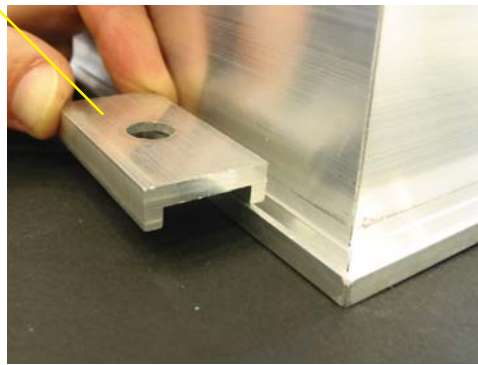
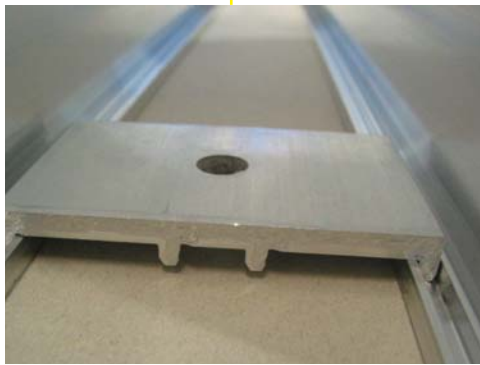


Place the second collector with a distance next to the first.

Push carefully until collector connectors engage into angle. Mount the collector connections completely.

Mount the double fastening plate between the collectors.

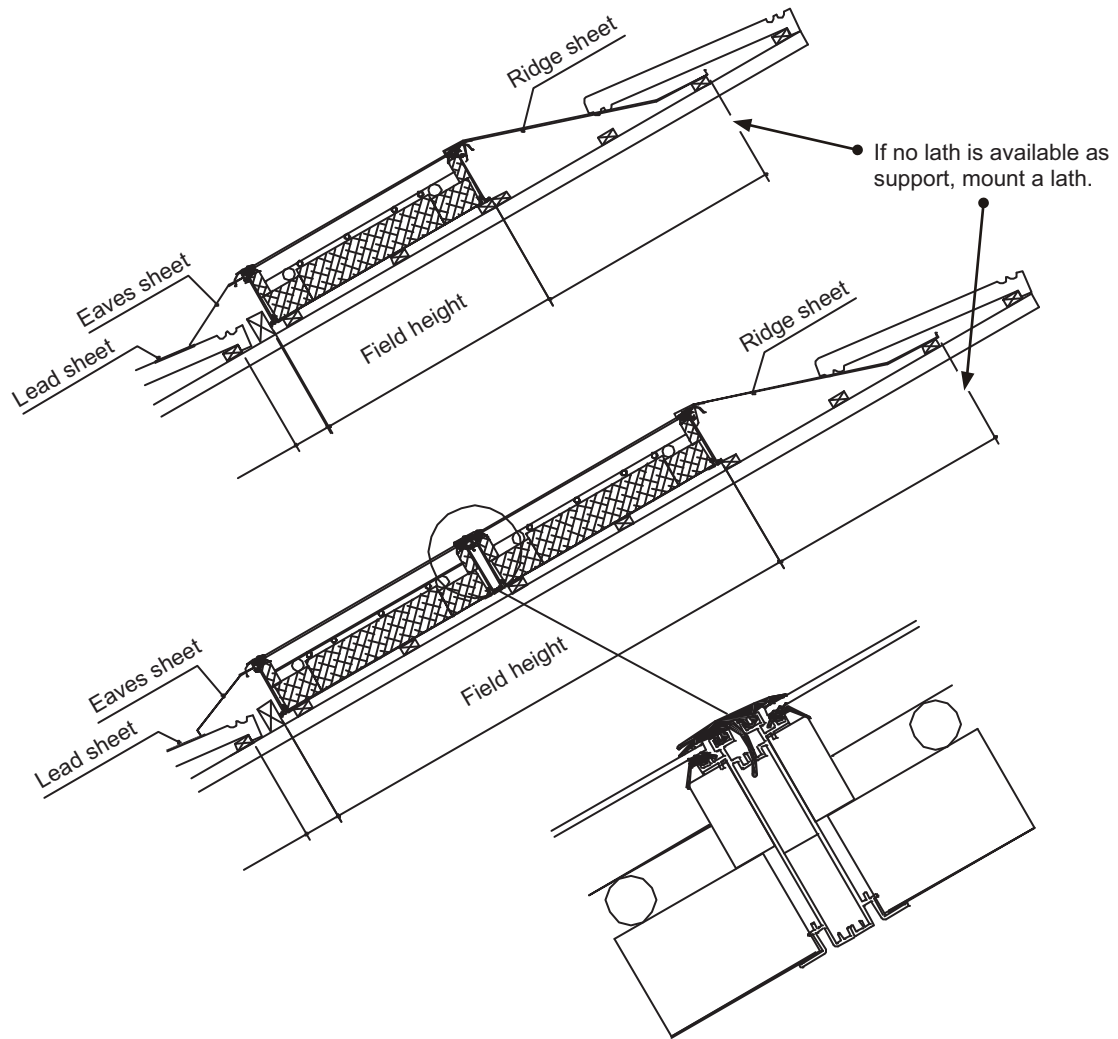
Further collectors have to be mounted similarly.



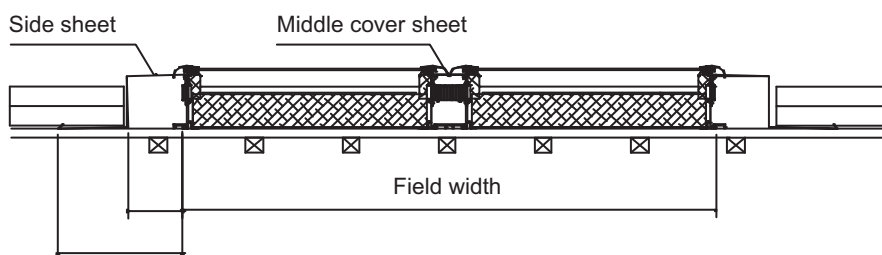


## 8 Roof build in collector field arrangement

*Vertical section across a collector field*

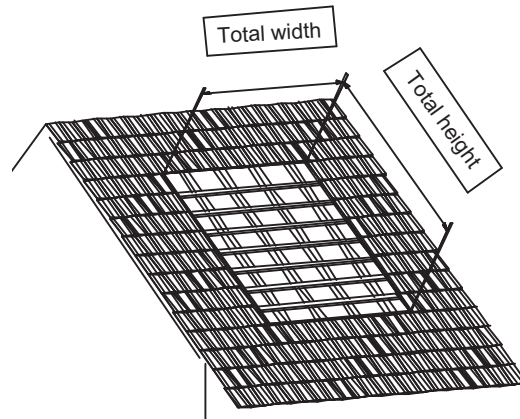


*Horizontal section across a collector field*





### 8.1 Re-roofing of the tiles and collector

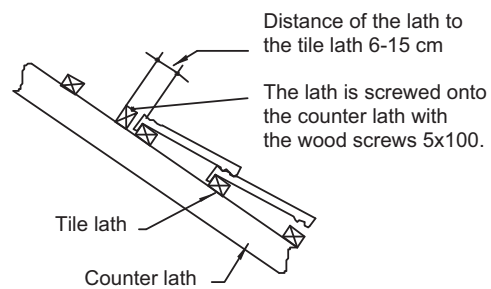


#### Uncovering of the tiles

In the drawing on the left the required space of the collectors is drawn in. The width and the height of the collector field can be seen on page 9. The total width results from: Field width (page 9) + 40 cm. The total height results from: Field height (page 9) + 53 cm - 62 cm. In this area the tiles have to be re-roofed.

#### Attention:

- For covering the border areas tiles are needed! Do not dispose all tiles!
- In case of uneven roofs the collectors need to be straightened.



#### Placing of the stop lath 40 x 60mm

First the stop lath is screwed onto the counter laths (see picture above). The stop lath must be mounted straight and absolutely parallel to the tile lath (line mark).

### Assembly of the collectors

The assembly of the collectors is always to be made from the bottom to the top i.e. the left or right lower collector must always be mounted first. The first collector is placed and mounted with a lateral distance to the first vertical tile row, covering the side sheet, of at least 10cm and at most 15cm.

The fastening of the collectors is realized by the fastening plates (aluminium) and the screws 6 x 40 mm (A2).

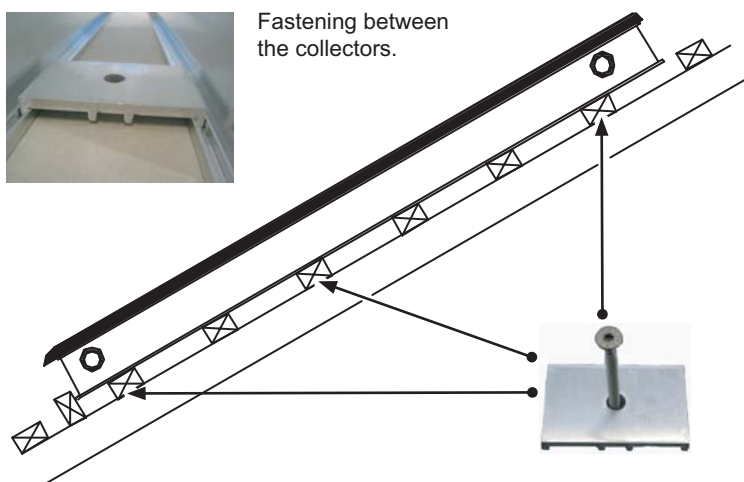
Between the collectors the fastening plate determines the distance of the collectors (Fastening plate engages into the collector profile to the left and to the right)

Attention:

Preassemble the compensators! After the assembly of the first collector the compensators are preassembled (see page 43-44). Fastening between the collectors.



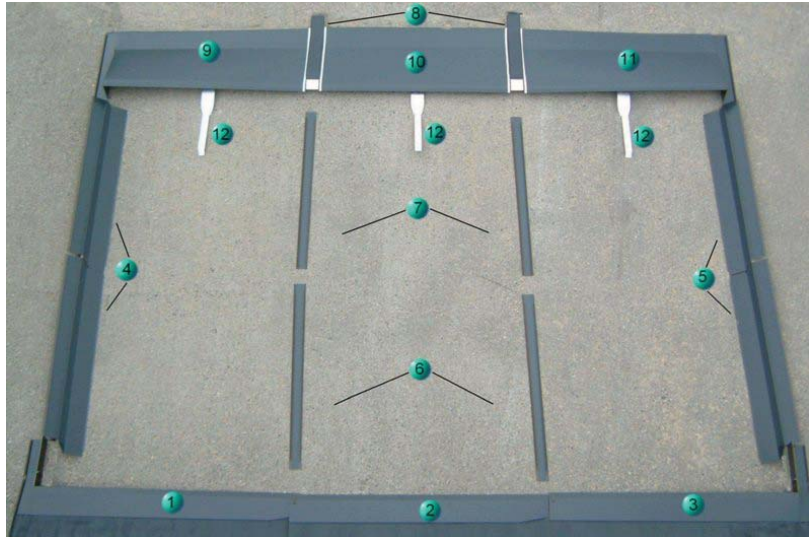
Fastening between the collectors.





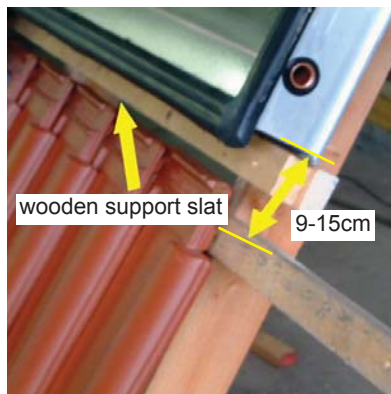
# 9 Mounting instructions collector sheet covers

1. Bottom sheet – left
2. Bottom sheet – center
3. Bottom sheet – right
4. vertical sheet - left
5. vertical sheet – right
6. connection sheet – bottom
7. connection sheet – top
8. top sheet connector
9. top sheet – left
10. top sheet – middle
11. top sheet – right
12. support sheet



## 9.1 Preparations before mounting

Before starting the installation of the metal cover sheets, ensure the distance between the wooden support slat ( upper side) and the roof tiles slat underneath ( upper side), is between 9 – 15 cm.



# 9

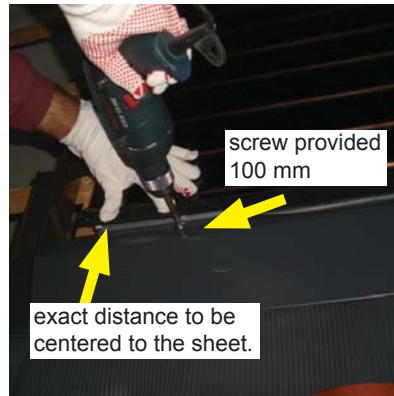
## Mounting instructions collector sheet covers

### 9.2 Bottom sheet left (1)

Push the bottom sheet underneath the silicon cover of the panels; and click the bottom sheet in the profile of the panel.

The left and right distance of the sheet will be determined by the shape of the vertical sheets ( left and right – 4 & 5 on page 35 ).

After mounting the vertical sheets left and right ( 4 & 5 on page 35); the bottom sheet has to be fixed in the 3 holes in the sheets by using the provided screws (100 mm length).



### 9.3 Bottom sheet- center

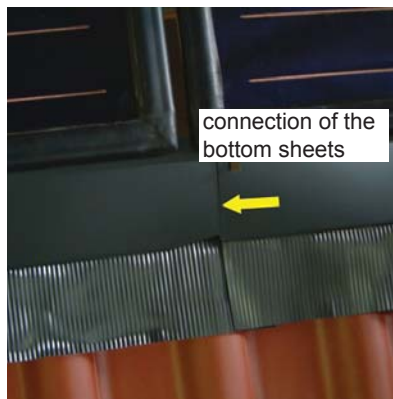
If more than 2 collectors are being used please follow instructions underneath.

When mounting the bottom sheet, push the sheet upwards under the silicon cover of the panels.  
When moved to the right position, the sheet will slide into the collector profile.  
After put in the right position secure the sheet with the 3 screws provided.

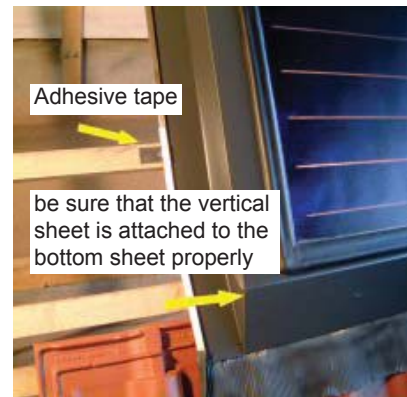
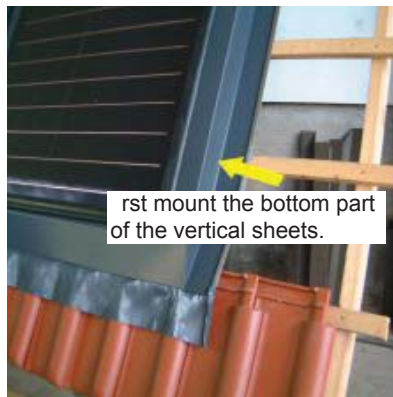


#### Remark

- When more than 2 collectors are being used, more than 1 bottom sheet –center has to be mounted as extension, depending on collector numbers.
- Mounting all sheets will be as mentioned above.



### 9.4 Vertical sheet left – vertical sheet right



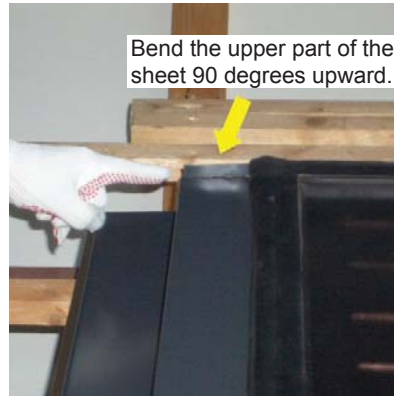
The vertical sheets left and right are conic-shaped and in 2 pieces. Both pieces are equal; and top and bottom part are exactly the same.  
Start with mounting the bottom part of the sheet, by pushing the sheet under the silicon cover of the panel, and push it tightly into the corner of the bottom sheet.  
After mounting the bottom ½ of the sheet; mount the top ½ of the sheet in the same way.  
Be sure that the top ½ will overlap the bottom ½ of the sheet.  
After mounting the total sheet, use the provided adhesive tape to fix the sheets to the roof support slats. ( 2-3 pieces of tape per sheet )

# 9

## Mounting instructions collector sheet covers

If more sheets are connected to each other also use the adhesive tape to fix the overlap of these sheets.

Finally the upper part of the sheet has to be bended 90° upwards as shown on the photo below.

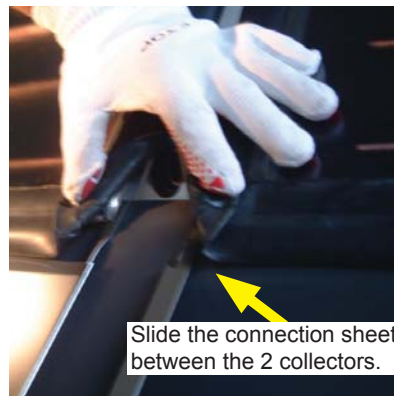


### 9.5 Connection sheet top (7) and bottom (8)

The connection sheets top and bottom are both in 2 pieces; these 2 pieces can be mounted in only 1 way, and can not be exchanged. First the top part of the connection sheets have to be mounted. This part can be recognized by the upward folded metal corners. This sheet part has to be slid into the collector profile.

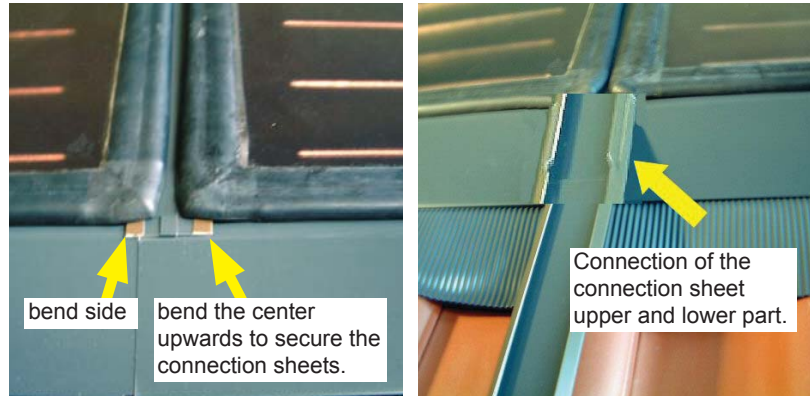
After this the bottom 1/2 of this sheet has to be clicked into the top 1/2 of the sheet.

Then push the total sheet upwards in the collector profile until the bottom part of the sheet is on the same level as the bottom sheet of the collector.



To ensure that the connection sheets are fixed and don't fall out, the metal at the bottom of the connection sheets has to be bent upwards.

The part of the metal sheet sticking out at the top of the silicon cover will be bent to connect to the top sheet connector later in the mounting process.



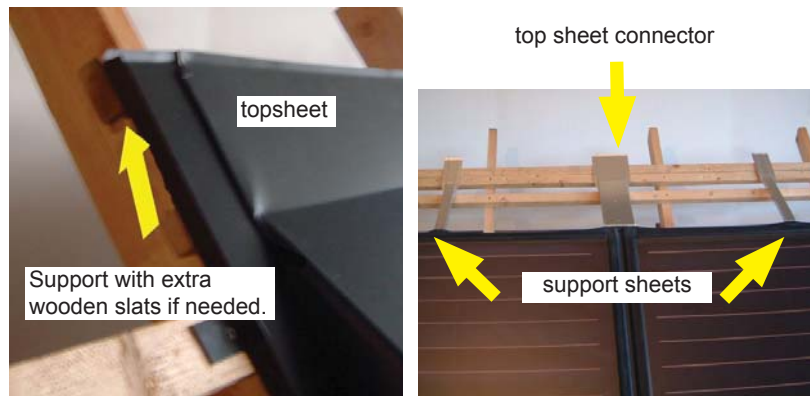
#### 9.6 Preparations before mounting

To ensure the right fixing and support of the top sheets of the collector; extra wooden support slats have to be mounted.

Before mounting the top sheets, first the support sheets (12), and the top sheet connector (8); both made of aluminium, have to be mounted by clicking these in the collector profile.

The top sheet connectors (8) will support the top sheets ( 9-10-11 ) as well as the support sheets (12).

The support sheets ( 12 ) always have to be mounted in the center of collector. The top sheet connectors always have to be mounted at the location where collectors meet. ( in this case under the silicon covers)



# 9

## Mounting instructions collector sheet covers

### 9.7 Top sheet-left

First push the top sheet left in the profile of the vertical left sheet.  
After that push the topsheet-left **on top** of the silicon cover of the panel.  
Take care that the support sheets are not moved.



#### Remark

ensure that the top sheet is completely mounted on top of the silicon collector cover.

---

### 9.8 Top sheet middle

In case of more than 2 collectors.

Mount the top sheet middle in exactly the same way as the top sheet-left.  
( This means **on top** of the silicon cover of the panel).

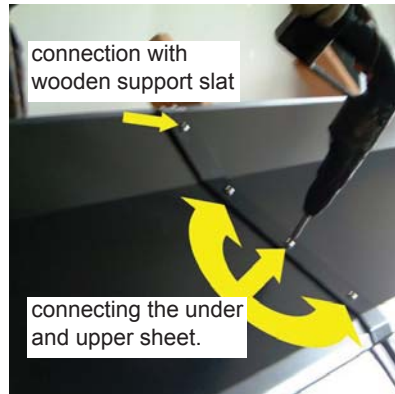
### 9.9 Top sheet-right



Mount the top sheet-right in exactly the same way as the top sheet-left and top-sheet middle.

**To fix the top sheets left and right 3 provided screws are used; to fix the top sheet middle 2 provided screws are used.**

### 9.10 Top sheet connector

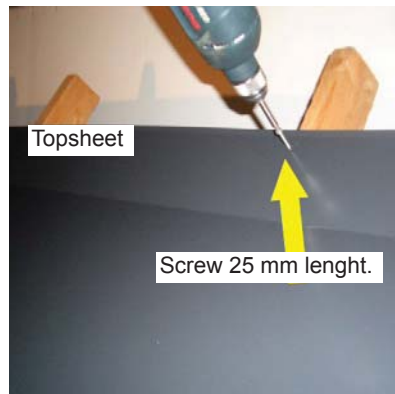


Put the top sheet connector on top of the top sheet, and ensure that the perforated holes in the metal sheet are exactly in line.

If the sheet is in the right position use the 3 provided screws to fix the bottom part of the sheet.

A 4<sup>th</sup> screw has to be used to fix the sheet to the wooden support slat of the tiles.

### 9.11 Mounting the top sheets



The top sheets have to be fixed with screws in every 50 -70 cm distance.

For the top sheets left and right 3 screws are needed.

For the top sheets middle 2 screws are needed.

# 9

## Mounting instructions collector sheet covers

### 9.12 Silicon kit sealing



Finally the supplied silicon kit sealing has to be applied to the top sheets and vertical sheets.  
Ensure that the sheets are dry, clean and free of dust before applying the silicon sealing to ensure a good connection of the kit sealing.

### 9.13 Applying the lead-skirt on the roof tiles.



Press the lead-skirt as shown on the pictures in the same shape as the tiles being used.

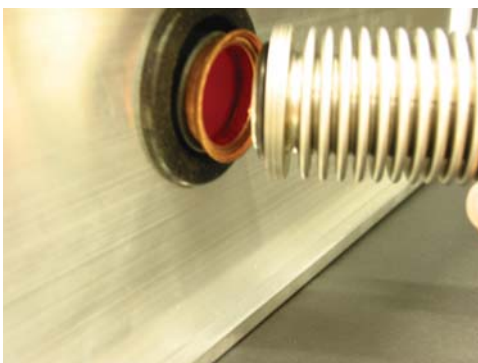
# 10 Collector connectors



Compensator with O-ring seal 20x2mm slid on

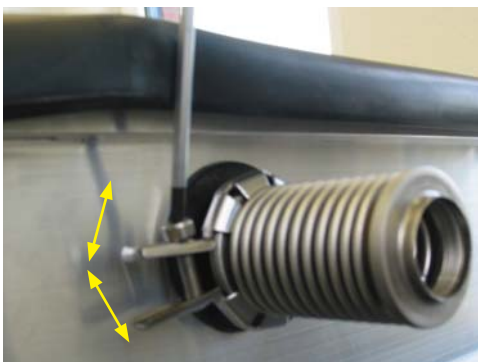


Clamp collector connection bends up for mounting.



Push compensator with cylindrical end into the collector connection.

Pay attention that the collector connection is clean.

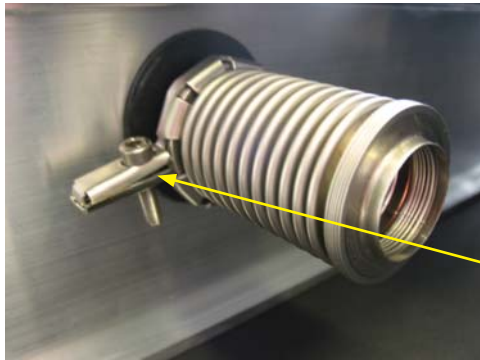


Before tightening of the screw the clamp must be positioned by a rotary motion to the up and down.

Tighten clamp collector connection with cylinder head screw M4x16.

# 10

## Collector connectors



Completely mounted compensator on one side.

After positioning of the second collector the compensator is mounted in the same way.

**Attention:**  
Do not forget the O-ring seal

• Tightening of the clamp until bothnibs lay one upon the other all over the length.

# 11 Collector connections



Cover is mounted on all non-used collector connections.



Connection for soldered or clamping ring joints available dimensions: 12mm, 15mm, 18mm, 22mm



Connection 3/4"



Exhauster without extension



Exhauster with extension



Exhauster completely mounted .  
All other connections as well as the covers are mounted in the same way.

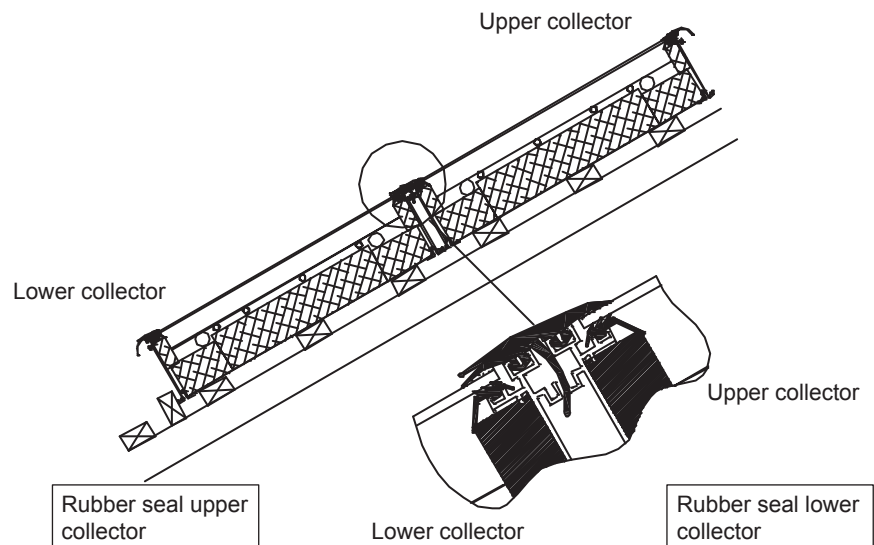
# 12 Collector assembly completion

## Single-row fields:

After the assembly of the first collector the second is placed right next to the first with a distance of 10 to 20cm. Now the compensators have to be mounted at the first collector and the O-ring seals have to be slid over the cylindrical end of the compensator at the side of the next collector (see also page 43-44). Afterwards the collector is pushed carefully until the compensators engage into the collector connection. Then the clamps are mounted. Upon both compensators are mounted, the fastening plates are mounted between the collectors (see page 29-30). Therefore push the collector carefully until the fastening plate engages into the collector profile. All other collectors are mounted similarly.

## Multi-row fields:

Basically in case of multi-row fields the collectors lying on top of each other are mounted first. After the assembly of the first collector the second collector is mounted on top of the first. The upper collector rests against the lower collector. The collectors lying on top of each other have to align exactly. The rubber seal of the lower collector lies between the collectors (see picture below). The rubber seal of the upper collector lies on the seal of the lower collector (see picture below). After the second collector is placed, it is fixed and the compensators are mounted. The further procedure complies to the assembly of single-row fields.

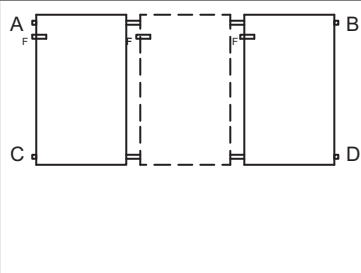
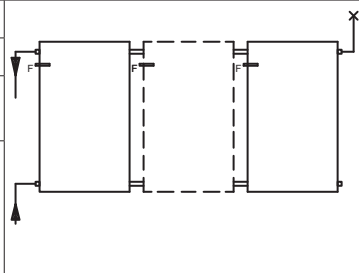




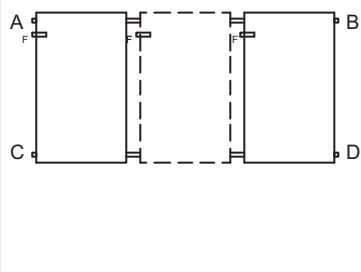
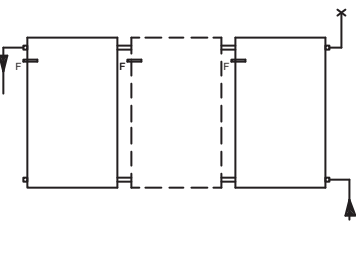
# 13 Hydraulic connections

Connection warm = Connection to the consumer  
 Connection cold = Connection from the consumer  
 Flex-Connection = Art.Nr.  
 \* = exhauster device

*Installations with 1 to 6 collectors single-row*

|  |  |        |  |
|--|--|--------|--|
|  | Connection warm above.   | A or B |  |
|  | Connection cold below.   | C or D |  |
|  | Close non-used connections with cover.   |        |  |
|  | F = Temperature sensor bush.<br>The temperature sensor can be inserted into any collector.<br>Protect the temperature sensor against slipping out. |        |  |

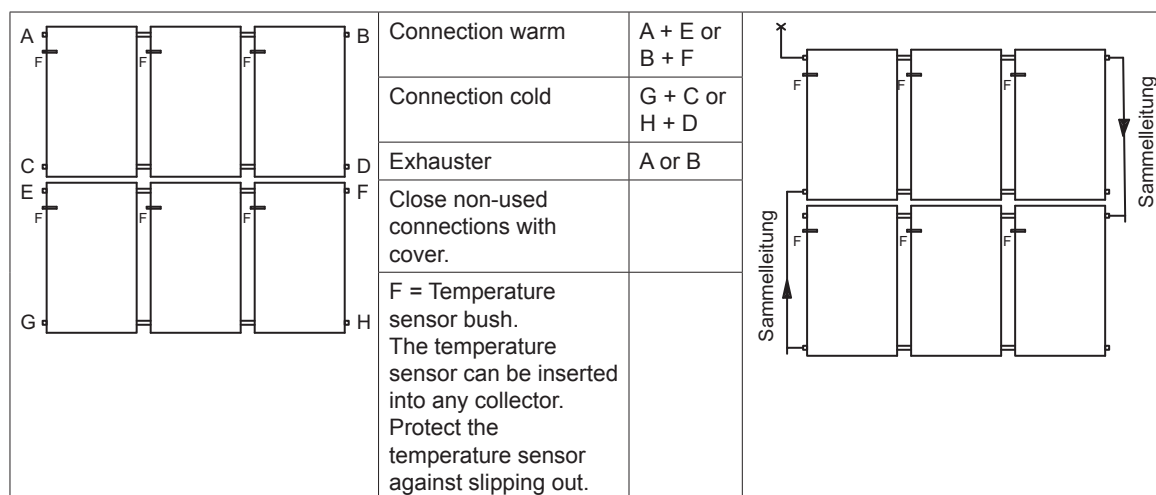
*Installations with 1 to 6 collectors single-row*

|   |  |                    |   |
|---|--|--------------------|---|
|  | Connection bottom left/<br>right top.  | cold=C /<br>warm=B |  |
|   | Connection bottom right/<br>left top.  | cold=D /<br>warm=A |   |
|   | Close non-used connections with cover.   |                    |   |
|   | F = Temperature sensor bush.<br>The temperature sensor can be inserted into any collector.<br>Protect the temperature sensor against slipping out. |                    |   |

**Caution:**

Since the temperature of the pipes from and to the solar collectors can become high, Viton seal rings must be applied when press couplings are used. Viton seal rings have a temperature resistance to 180 °C. Regular press fittings for tap water are insufficiently temperature-resistant and have, therefore, too short a life span.

Installations with collector rows on top of each other



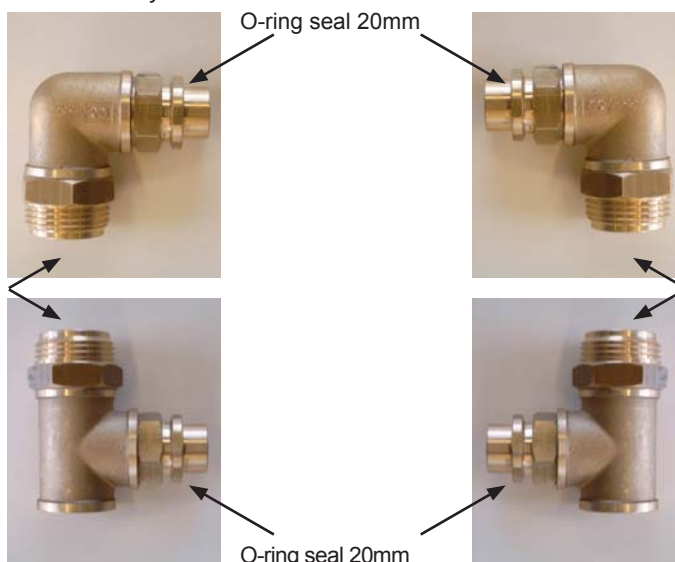
In case of installations that are smaller than 50m<sup>2</sup> the connecting pipe can be connected optionally from the bottom or from the top to the extern collecting pipe.

In case of installations that are bigger than 50m<sup>2</sup> the connecting pipe must always be connected to the extern collecting pipe via the diagonal e.g. left bottom and right top (therefore see also page 49).

### 13.1 Hydraulic connections with collecting pipe

Hydraulic connections for multi-row installations

Elbow collecting pipe connection.



Elbow collecting pipe connection.

O-ring seal 20mm  
T-single collecting pipe connection.

O-ring seal 20mm  
T-single collecting pipe connection.

### 13.2 Overview hydraulic connections



Collector connection 12 mm for soldered fittings or clamping ring joints.



Collector connection 15 mm for soldered fittings or clamping ring joints.



Collector connection 18 mm for soldered fittings or clamping ring joints.



Collector connection 22 mm for soldered fittings or clamping ring joints.



Collector connection 3/4" for threaded fittings.

# 13

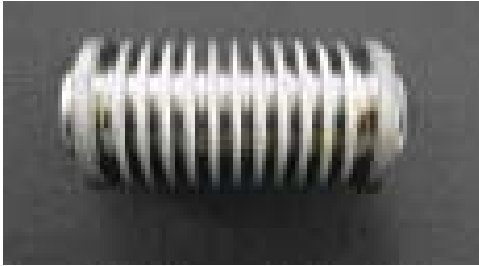
## Hydraulic connections



Exhauster connection for installation at the collector without extension.



Exhauster connection for installation at the collector with extension.



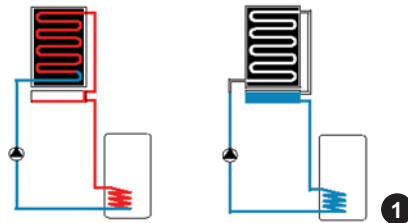
Collector connector hydraulic (Compensator) connects two collectors and compensates the thermal dilations.



Clamp collector connection and O-ring seal Clamp for connection of the above mentioned hydraulic devices with the ange at the collector.

# 14 Drainback system accessory

## 14.1 General Safety Information



Please read the complete instruction manual about the drain back systems, before installing the system and before taking the system into use. Be aware that the installation of the system and parts must be done by qualified technicians only. Before installing the drainback modules; always check and work according to the applicable local regulations and laws.

### Drainback modules Functionality

The patented drain back module is an innovating solution for emptying the solar thermal installation. With the drainback module only the collectors and the pipe system between the drainback module and the collectors will be emptied. In case the solar pump stops the Glycol solar fluid will be stored within the drain back module, to prevent overheating of the solar collector. The use of the drainback module will prevent early aging of the solar fluid, and will keep the collectors clean.

The filling of the drain back module will be controlled by the solar control. In case the Delta T between the solar collector and the solar storage tank is over 5° C, the solar pump will start and pump the solar fluid into the collector where it can take up the solar heat. The drainback module will be filled with the air inside the system at this moment.

After the maximum temperature in the solar storage tank has been reached the solar pump will stop and the solar fluid will be flowing into the drainback module again.

With the drainback module no extra or extra strong solar pump is needed to fill the system.

The standard mounted pump applied solar pump station will be suitable for systems up to 15 solar collectors.

Drainback modules are mounted directly to the under part of the solar collectors.

### Technical Specifications drainback modules

The drainback modules are made of high quality aluminum, suitable for outdoor use.

All inner parts of the drainback modules which are in direct contact with the solar fluid, are made of high resistant Stainless Steel.

Remark : Please be aware not to use any materials within the installation that could be harmful to stainless steel.

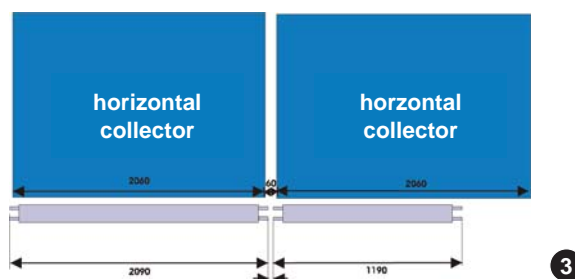
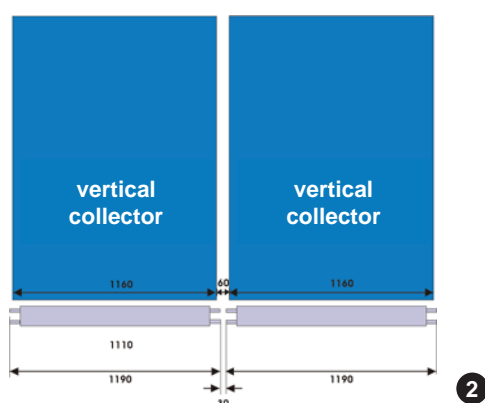
**System requirements**

drainback modules should only be applied on vertical or horizontal collectors. All pipes connected between the solar collectors and drainback module must be connected in such way that a natural flow from the solar fluid from the collectors to the drainback modules is ensured in case the solar pump stops. It is not allowed to mount any one way valves in the installation between the solar collectors and the drainback modules. Drainback modules can be used in a vented as well as an unvented system.

**Storage numbers drainback modules:**

DB 5 – 5 liters

DB 10 – 10 liters



## 14.2 Sizing of the drainback modules

To ensure the right storage solar systems can be ordered with and without drain back systems. In case the installation is requested with drain back, the manufacturer will supply the complete drainback module package to ensure the proper functioning of the installation.

Drainback modules will be mounted and connected directly under the solar collectors.

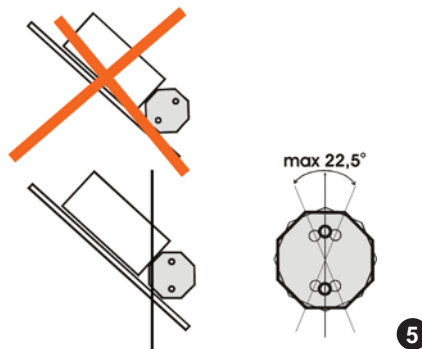
Drainback modules always need to be mounted at least 50 cm higher than the solar pump and solar heat exchanger.

### Positioning of the drainback module



The drainback module has to be mounted as shown in picture 4. The red connection on the drainback module is needed as the input connection on the drainback module.

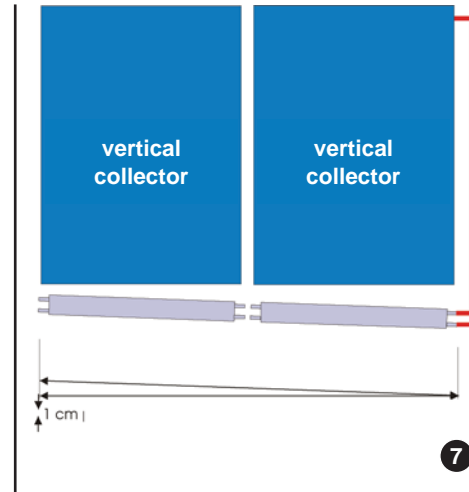
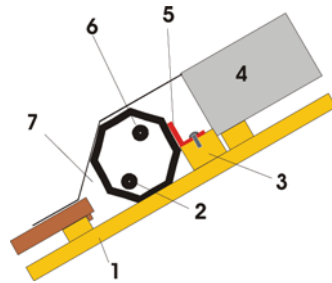
### Connection pipes – diameter ( mm)



The connection pipes must be applied according to the dimensions in picture 5. Be sure the pipe connections are always mounted in a way that natural flow towards the drainback module is guaranteed.

### 14.3 Roof integrated installations

1. Roof panel
2. Drain back output
3. wooden mounting slat 4 x 6 cm
4. collector
5. connection profile
6. drain back input
7. cover sheet



### 14.4 Mounting instructions

1. Put the drainback module on the roof as shown in picture 6. Ensure that the connections 6 and 2 are located as shown in picture 4. The red colored connection on the drainback module is the input connection of the drainback module.
2. The aluminum connection profile (5) has to be connected to the drainback module by sliding it into drainback module profile. After this screw the connection profile onto the wooden support slat.
3. Connect the drainback module to the collector. Ensure that the drainback module is mounted as shown in picture 7. The distance between the 2 outer points of the drainback module must be approximately 1 cm.
4. the output of the collector has to be connected by a pipe to connection 6 on the drainback module.
5. The output of the drainback module (2) has to be connected to the input of the solar collector.
6. In case only 1 drainback module is in use, the remaining 2 connections on the module have to be plugged.
7. In case more drainback module are to be applied, mount the modules similar as mentioned above.
8. Finally mount the cover sheet (7) as shown in drawing A.

#### Mounting multiple drainback modules

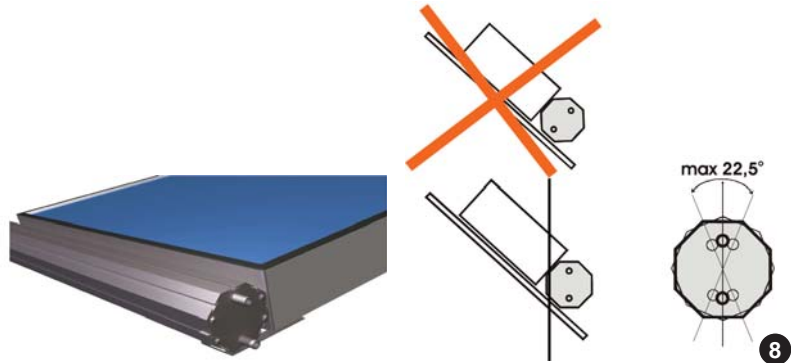
In case multiple drainback modules need to be applied, connect the modules as written above.

All modules have to be connected with the supplied pressure fittings. Be aware that the natural flow of the solar fluid is guaranteed by having the modules mounted downwards as shown in picture 7. drainback modules will be mounted and connected directly under the solar collectors.

#### 14.5 On-roof mounting installations

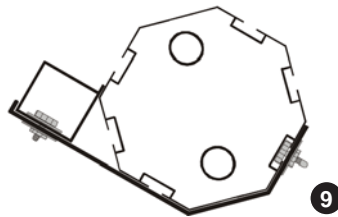
Drainback module always need to be mounted at least 50 cm higher than the solar pump and solar heat exchanger.

##### Positioning of the drainback modules



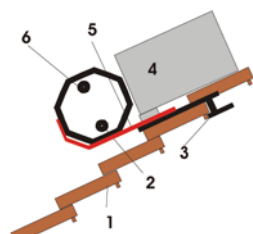
The drainback module has to be mounted as shown in picture 8. The red connection on the drainback module is needed as the input connection on the drainback module.

##### Connection pipes – diameter ( mm)

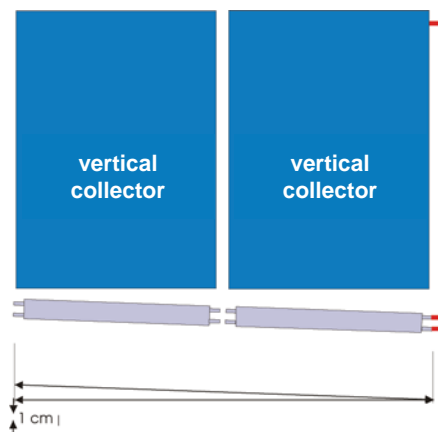


The connection pipes must applied according to the dimensions in picture 7. Be sure the pipe connections are always mounted in a way that natural flow towards the drainback module is guaranteed.

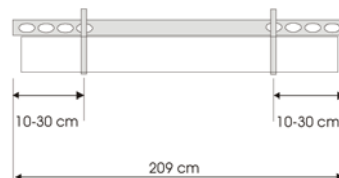
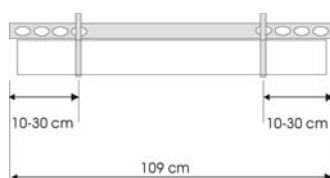
1. Roof panels
2. Drain back output
3. connection plate
4. solarcollector
5. support connection
6. drain back input



10



11



12

### 14.6 Mounting instructions

1. Put the drainback module on the aluminum profile 5 as shown in picture 10.
2. The aluminum connection profile (5) has to be connected to the drainback module by sliding it into drainback module profile. After this screw the connection profile onto the wooden support slat (picture 14). Guarantee that the connection 6; drain back input is positioned at the upper side.
3. Connect the drainback module to the support connection (5) as shown in picture number 12. The distance between the outside of the support connection of the drainback module must be approximately 10-30 cm as shown in picture 12.
4. Also ensure distance between the 2 outer points of the drainback module must be approximately 1 cm (picture 11).
5. the output of the collector has to be connected by a pipe to connection 6 on the drainback module.
6. The output of the drainback module (2) has to be connected to the input of the solar collector.
7. In case only 1 drainback module is in use, the remaining 2 connections on the module have to be plugged.
8. In case more drainback module are to be applied, mount the modules similar as mentioned above.

### Mounting multiple drainback modules

In case multiple drainback modules need to be applied, connect the modules as written above.

All modules have to be connected with the supplied pressure fittings.

Be aware that the natural flow of the solar fluid is guaranteed by having the modules mounted downwards as shown in picture 11.

#### 14.7 Console mounting on flat roofs

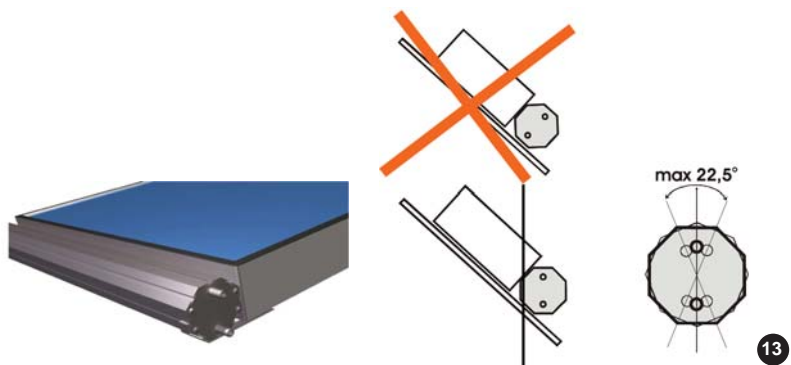
Drainback modules will be mounted and connected directly under the solar collectors.

Drainback modules always need to be mounted at least 50 cm higher than the solar pump and solar heat exchanger.

#### Positioning of the drainback modules

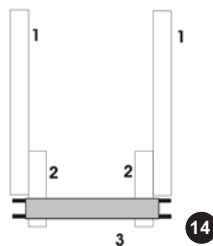
The drainback modules has to be mounted as shown in picture 13.

The red connection on the drainback module is needed as the input connection on the drainback module.

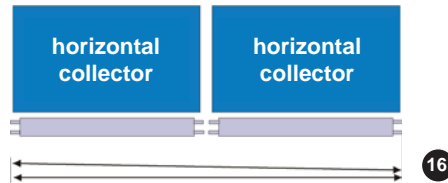
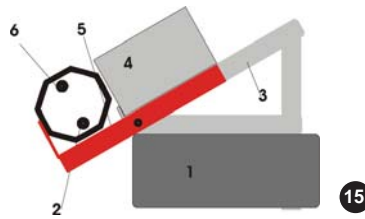


#### Connection pipes – diameter ( mm)

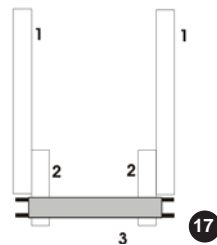
The connection pipes must applied according to the dimensions in picture 14. Be sure the pipe connections are always mounted in a way that natural flow towards the drainback module is guaranteed.



1. concrete weight
2. drain back output
3. Console
4. Collector
5. connection pro le
6. drain back input



1. Console
2. connection pro le
3. drain back



### 14.8 Mounting instructions

1. Put the drainback module on the aluminum console as shown in picture 15. The drainback module has to be mounted before mounting the solar collectors.
2. At first mount the 2 supplied connection pro les(2) to the console (3) as shown in picture 17 and connect the drainback module to the connection pro le as shown in picture 15.
3. Ensure that the drain back input is in the upright position as shown in picture 13, and than mount the drainback module to the console with the supplied screws.
4. Also ensure distance between the 2 outer points of the drainback module must be approximately 1 cm (picture 16).
5. the output of the collector has to be connected by a pipe to connection 6 on the drainback module.
6. The output of the drainback module (2) has to be connected to the input of the solar collector.
7. In case only 1 drainback module is in use, the remaining 2 connections on the module have to be plugged.

### Mounting multiple drainback modules

In case multiple drainback modules need to be applied, connect the modules as written above.

All modules have to be connected with the supplied pressure fittings.

Be aware that the natural flow of the solar fluid is guaranteed by having the modules mounted downwards as shown in picture 16.

## 14.9 Important

### Filling the system with solar fluid



#### Remark

the temperature of the system should not exceed 20° C when filling the system with solar fluid. Do not fill during sunshine !!

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Since warm air will expand, it might be necessary to let extra air in the system after the filling has been finished and the installation has cooled down.

This to prevent under pressure in the solar system.

If this is needed the solar pump must be shut off before opening a screw to let the air in the system.

1. Close the stop valve in the collector return pipe, pressure side of the pump.
2. Open the tap in the security group mounted above the pump.
3. Connect filling pump on the tap on the suction side of the pump.
4. Start filling the system with solar fluid using the filling pump on the suction side of the pump until it's completely filled.
5. Close the tap in the security group.
6. Open the stop valve in the collector return pipe, pressure side of the pump.
7. Do again fill the system with solar fluid until the maximum fill level is reached.
8. Now empty the following amounts of fluid:  
Amount A: for each litre drainback module storage capacity 0.17L (e.g. 10L capacity = 1.7L).  
Amount B: 0.04 x full installation content of fluid (e.g. 30L content = 1.2L) emptying.  
Amount total: amount A + amount B (e.g. 1.7L + 1.2L = 2.9L).
9. Close the stop valve in the collector return pipe, pressure side of the pump again and refill amount A.
10. Close all taps open the stop valves and engage the pump. Control functionality of whole system carefully and switch on automatic operation.

**Frost security**

The manufacturer advises to use only the manufacturer supplied Tyfocor L solar fluid.

Tyfocor L is a ready-mix 40 % Glycol solution which will prevent the system from freezing up to a temperature of -21 ° C.

**Maintenance**

A solar installation has to be maintained every year.

During the annual maintenance all components have to be checked and tested.

If additional filling of the installation is needed; always use identical solar fluid as used originally.

Mixing different fluids can result in improper functioning and damaging of the installation.

# 15 Warranty

A.O. Smith products do meet the highest standards and quality demands. In case any malfunctioning of A.O. Smith products might occur, the below warranty rules will apply:

- 15.1 Warranty general** If, within 10 years from the installation date, after investigation and exclusive evaluation by A.O. Smith, a collector turns out to be not properly functioning as a result of manufacturing or material faults, A.O. Smith will replace this collector free of charge.
- 15.2 Conditions of installation and use** The warranty referred to in Article 1 only applies if the following conditions are met:
- The collector(s) are installed according to the installation instructions as mentioned in this manual; as well as according to the local and national applicable installation and building regulations, instructions and rules.
  - The collector will remain installed in the original installation area.
  - Only suitable solar fluids are being used as recommended by A.O. Smith.
  - The Solar system will be protected against frost-damage. Any risk on damage because of frost will be not be covered by A.O. Smith Warranty.
  - The solar installation will be maintained and checked by A.O. Smith, or a certified installer on yearly basis to secure the right functioning of the installation.
  - The collector system will be protected by a pressure safety valve with a pressure relief of maximum 6 bar.
  - The collector circuit will be refreshed with new Solar fluid at least every 3 years to prevent damaging because of aging of the solar fluid.
- 15.3 Exclusions** The warranty referred to in Article 1 does not apply:
- If the collector has been damaged by an external cause;
  - In case of abuse, neglect (including freezing), modification, incorrect and/or deviating use of the collector and if attempts were made to repair leaks;
  - If contamination or other impurities were allowed to flow into the collector;
  - If any other solar fluids than recommended or by written agreement agreed by A.O. Smith are being used.
  - If the owner has attempted to repair a defective collector himself.
  - Any damage that has occurred because of extreme wind conditions are excluded from warranty.
- 15.4 Extent of the warranty** A.O. Smith's commitments pursuant to the warranty provided are connected to the free of charge ex-warehouse delivery of the collector to be replaced or any parts thereof. A.O. Smith shall not bear the transport, labour, installation and other costs in connection with the replacement.
- 15.5 Claims** A claim based on the warranty provided shall be deposited with the dealer from whom the collector was purchased or any other dealer who sells products manufactured by A.O. Smith. The investigation of the collector as referred to in the Articles 1 and 2 will take place in an A.O. Smith laboratory.

### 15.6 Obligations of A.O. Smith

Concerning its collectors or any collector replacement part supplied, respectively, A.O. Smith will not provide any warranty or guarantee other than the warranty explicitly stated in this manual.

A.O. Smith shall not accept any liability pursuant to the warranty or otherwise for any injuries to persons or damage to materials caused by a collector or replacement collector or any part thereof supplied by A.O. Smith.

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Zonnecollectoren - Lijst van onderdelen

Solarcollectors - Parts overview

Panneau solaire - Vue d'ensemble des pièces

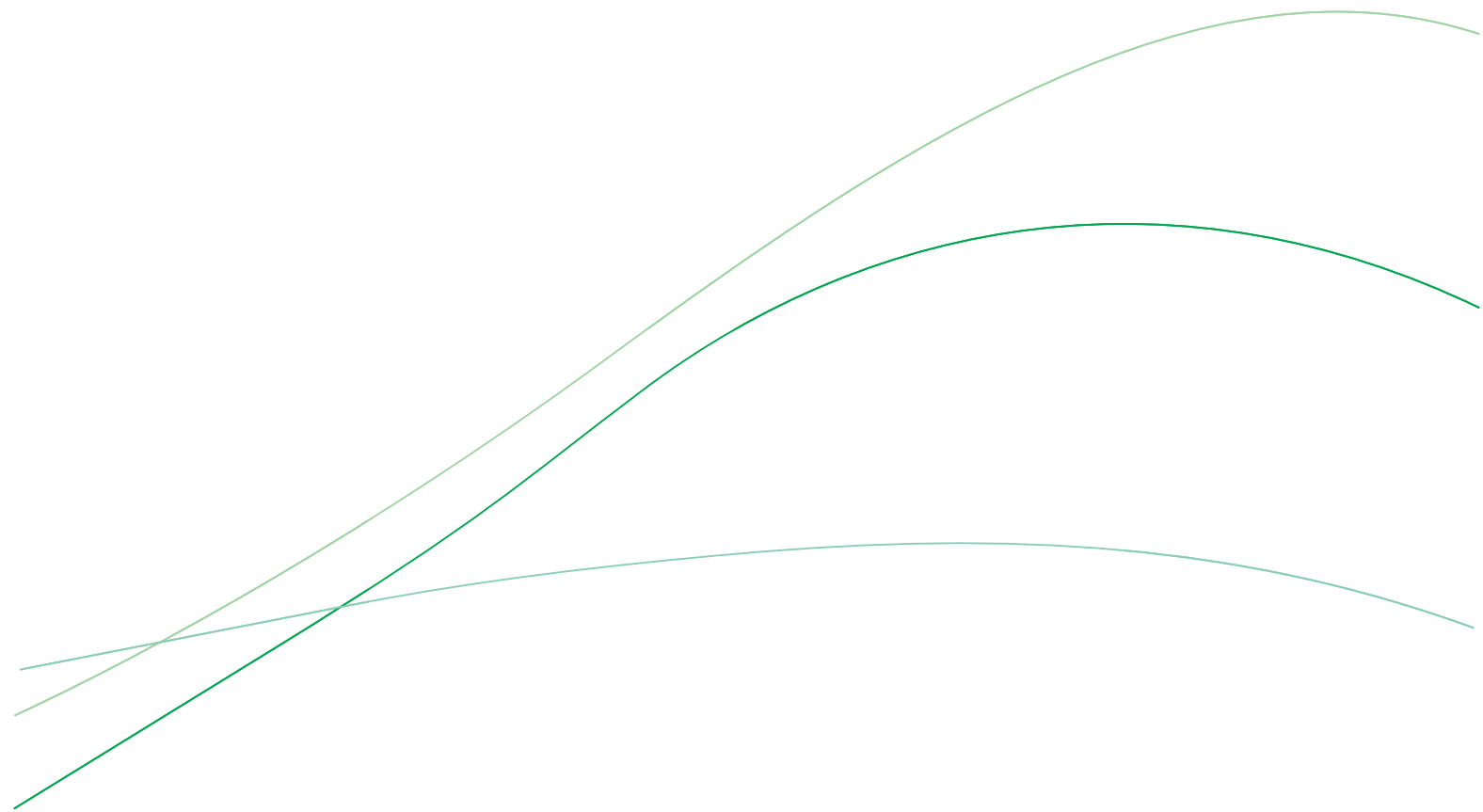
Sonnenkollektoranlage - Übersicht der Teile

Collettore Solare - Panoramica delle parti

Receptores Solares - Lista de componentes

Painel Solar - Lista de Componentes

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**ONDERDELENLIJST / PART LIST / LISTE DES COMPOSANTS / LISTE DER KOMPONENTEN / ELENCO DEI COMPONENTI / LISTA DE COMPONENTES**

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| 0308744<br>(1200201) |  |

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**ONDERDELENLIJST / PART LIST / LISTE DES COMPOSANTS / LISTE DER KOMPONENTEN / ELENCO DEI COMPONENTI / LISTA DE COMPONENTES**

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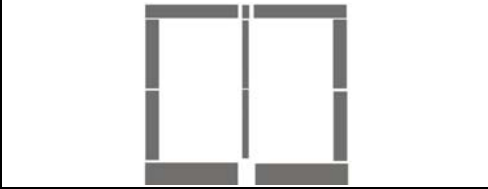

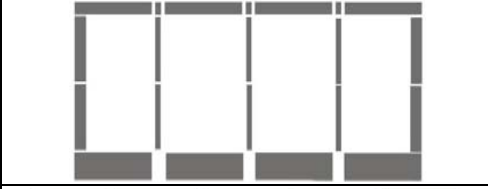


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**OPTIE / OPTION / OPTION / OPTION / OPZIONI / OPCION / OPÇÃO**

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SAMENSTELLING VAN DE SPBO-SET / CONTENTS SPBO-SET / SOMMAIRE SPBO ENSEMBLE / INHALT SPBO GESETZT / COMPOSIZIONE DEL SET SPBO /  
 COMPOSICIÓN DE SPBO CONJUNTO / COMPOSIÇÃO DO CONJUNTO SPBO

|   |           | NR.     |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |   |
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|   | SPBO 03 1 | 3       | 2       | 2       | 2       | 1       | 3       | 2       | 1       | 1       | 1       | 1       |         |         | 2       | 1       | 1       | 1       | 8       | 3       |         |         | 2       | 1       | 2       |   |
|   | SPBO 04 1 | 4       | 3       | 3       | 2       | 1       | 4       | 3       | 1       | 1       | 1       | 1       |         |         | 3       | 1       | 1       | 1       | 10      | 4       |         |         | 3       | 1       | 3       |   |
|   | SPBO 05 1 | 5       | 4       | 4       | 2       | 1       | 5       | 4       | 1       | 1       | 1       | 1       |         |         | 4       | 1       | 1       | 1       | 12      | 5       |         |         | 4       | 1       | 4       |   |
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|   | SPBO 07 1 | 7       | 6       | 6       | 2       | 1       | 7       | 6       | 1       | 1       | 1       | 1       |         |         | 6       | 1       | 1       | 1       | 16      | 7       |         |         | 6       | 1       | 6       |   |
|   | SPBO 08 1 | 8       | 7       | 7       | 2       | 1       | 8       | 7       | 1       | 1       | 1       | 1       |         |         | 7       | 1       | 1       | 1       | 18      | 8       |         |         | 7       | 1       | 7       |   |
|   | SPBO 09 1 | 9       | 8       | 8       | 2       | 1       | 9       | 8       | 1       | 1       | 1       | 1       |         |         | 8       | 1       | 1       | 1       | 20      | 9       |         |         | 8       | 1       | 8       |   |
|   | SPBO 10 1 | 10      | 9       | 9       | 2       | 1       | 10      | 9       | 1       | 1       | 1       | 1       |         |         | 9       | 1       | 1       | 1       | 22      | 10      |         |         | 9       | 1       | 9       |   |
|   | SPBO 11 1 | 11      | 10      | 10      | 2       | 1       | 11      | 10      | 1       | 1       | 1       | 1       |         |         | 10      | 1       | 1       | 1       | 24      | 11      |         |         | 10      | 1       | 10      |   |
|   | SPBO 12 1 | 12      | 11      | 11      | 2       | 1       | 12      | 11      | 1       | 1       | 1       | 1       |         |         | 11      | 1       | 1       | 1       | 26      | 12      |         |         | 11      | 1       | 11      |   |
|   | SPBO 13 1 | 13      | 12      | 12      | 2       | 1       | 13      | 12      | 1       | 1       | 1       | 1       |         |         | 12      | 1       | 1       | 1       | 28      | 13      |         |         | 12      | 1       | 12      |   |
|   | SPBO 14 1 | 14      | 13      | 13      | 2       | 1       | 14      | 13      | 1       | 1       | 1       | 1       |         |         | 13      | 1       | 1       | 1       | 30      | 14      |         |         | 13      | 1       | 13      |   |
|   | SPBO 15 1 | 15      | 14      | 14      | 2       | 1       | 15      | 14      | 1       | 1       | 1       | 1       |         |         | 14      | 1       | 1       | 1       | 32      | 15      |         |         | 14      | 1       | 14      |   |
|   | SPBO 02 2 | 2       |         |         | 2       | 2       | 1       |         |         | 1       | 1       |         | 1       | 1       |         | 2       | 1       | 1       | 8       | 1       | 1       |         |         | 2       |         |   |
|   | SPBO 04 2 | 4       | 2       | 2       | 2       | 2       | 2       | 2       |         | 1       | 1       |         | 1       | 1       | 2       | 2       | 1       | 1       | 12      | 2       | 2       | 2       | 2       | 2       | 2       | 2 |
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|   | SPBO 08 2 | 8       | 6       | 6       | 2       | 2       | 4       | 6       |         | 1       | 1       |         | 1       | 1       | 6       | 2       | 1       | 1       | 20      | 4       | 4       | 6       | 2       | 6       | 6       | 6 |
|   | SPBO 10 2 | 10      | 8       | 8       | 2       | 2       | 5       | 8       |         | 1       | 1       |         | 1       | 1       | 8       | 2       | 1       | 1       | 24      | 5       | 5       | 8       | 2       | 8       | 8       | 8 |
| SPBO 12 2   | 12        | 10      | 10      | 2       | 2       | 6       | 10      |         | 1       | 1       |         | 1       | 1       | 10      | 2       | 1       | 1       | 28      | 6       | 6       | 10      | 2       | 10      | 10      | 10      |   |
| SPBO 14 2   | 14        | 12      | 12      | 2       | 2       | 7       | 12      |         | 1       | 1       |         | 1       | 1       | 12      | 2       | 1       | 1       | 32      | 7       | 7       | 12      | 2       | 12      | 12      | 12      |   |

SAMENSTELLING VAN DE SPBI-SET / CONTENTS SPBI-SET / SOMMAIRE SPBI ENSEMBLE / INHALT SPBI GESETZT / COMPOSIZIONE DEL SET SPBI /  
 COMPOSICIÓN DE SPBI CONJUNTO / COMPOSIÇÃO DO CONJUNTO SPBI

|   |           | NR.     |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
|---|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
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| AANTAL ONDERDELEN PER SET / AMOUNT OF PARTS PER SET /<br>NOMBRE DE PIECES PAR ENSEMBLE / ANZAHL DER TEILE PRO SET /<br>QUANTITÀ DI PEZZI PER SET / CANTIDAD DE PIEZAS POR JUEGO /<br>QUANTIDADE DE PEÇAS POR JOGO | SPBI 01 1 | 1       |         |         | 1       |         |         |         |         |         |         | 1       | 1       | 1       | 1       |         |         | 2       | 1       | 1       | 1       | 3       |         |         |
|   | SPBI 02 1 | 2       |         |         |         | 1       |         |         |         |         | 1       | 1       | 1       | 1       | 1       |         |         | 3       | 1       | 2       | 1       | 6       |         |         |
|   | SPBI 03 1 | 3       |         |         |         |         | 1       |         |         |         | 2       | 1       | 1       | 1       | 1       |         |         | 4       | 1       | 3       | 1       | 9       |         |         |
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|   | SPBI 05 1 | 5       |         |         |         |         |         |         | 1       |         | 4       | 1       | 1       | 1       | 1       |         |         | 6       | 1       | 5       | 1       | 15      |         |         |
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|   | SPBI 07 1 | 7       |         |         |         |         | 1       |         |         | 1       |         | 6       | 1       | 1       | 1       | 1       |         |         | 8       | 1       | 7       | 1       | 21      |         |
|   | SPBI 08 1 | 8       |         |         |         |         |         | 1       |         | 1       |         | 7       | 1       | 1       | 1       | 1       |         |         | 9       | 1       | 8       | 1       | 24      |         |
|   | SPBI 09 1 | 9       |         |         |         |         |         |         | 1       | 1       |         | 8       | 1       | 1       | 1       | 1       |         |         | 10      | 1       | 9       | 1       | 27      |         |
|   | SPBI 10 1 | 10      |         |         |         | 1       |         |         |         | 2       |         | 9       | 1       | 1       | 1       | 1       |         |         | 11      | 1       | 10      | 1       | 30      |         |
|   | SPBI 11 1 | 11      |         |         |         |         | 1       |         |         | 2       |         | 10      | 1       | 1       | 1       | 1       |         |         | 12      | 1       | 11      | 1       | 33      |         |
|   | SPBI 12 1 | 12      |         |         |         |         |         | 1       |         | 2       |         | 11      | 1       | 1       | 1       | 1       |         |         | 13      | 1       | 12      | 1       | 36      |         |
|   | SPBI 13 1 | 13      |         |         |         |         |         |         | 1       | 2       |         | 12      | 1       | 1       | 1       | 1       |         |         | 14      | 1       | 13      | 1       | 39      |         |
|   | SPBI 14 1 | 14      |         |         |         | 1       |         |         |         | 3       |         | 13      | 1       | 1       | 1       | 1       |         |         | 15      | 1       | 14      | 1       | 42      |         |
|   | SPBI 15 1 | 15      |         |         |         |         | 1       |         |         | 3       |         | 14      | 1       | 1       | 1       | 1       |         |         | 16      | 1       | 15      | 1       | 45      |         |
|   | SPBI 02 2 | 2       |         |         |         | 1       |         |         |         |         | 1       |         |         | 1       | 1       | 1       | 1       | 1       | 4       | 1       | 1       | 1       | 3       |         |
|   | SPBI 04 2 | 4       | 1       | 1       |         | 1       |         |         |         |         | 1       | 2       |         | 1       | 1       | 1       | 1       | 1       | 6       | 1       | 2       | 1       | 6       | 2       |
|   | SPBI 06 2 | 6       | 2       | 2       |         |         | 1       |         |         |         | 1       | 4       |         | 1       | 1       | 1       | 1       | 1       | 8       | 1       | 3       | 1       | 9       | 4       |
|   | SPBI 08 2 | 8       | 3       | 3       |         |         |         |         |         |         | 1       | 6       |         | 1       | 1       | 1       | 1       | 1       | 10      | 1       | 4       | 1       | 12      | 6       |
|   | SPBI 10 2 | 10      | 4       | 4       |         |         |         |         | 1       |         | 1       | 8       |         | 1       | 1       | 1       | 1       | 1       | 12      | 1       | 5       | 1       | 15      | 8       |
| SPBI 12 2   | 12        | 5       | 5       |         | 1       |         |         |         | 1       | 1       | 10      |         | 1       | 1       | 1       | 1       | 1       | 14      | 1       | 6       | 1       | 18      | 10      |         |
| SPBI 14 2   | 14        | 6       | 6       |         |         | 1       |         |         | 1       | 1       | 12      |         | 1       | 1       | 1       | 1       | 1       | 16      | 1       | 7       | 1       | 21      | 12      |         |

SAMENSTELLING VAN DE SPBO DB-SET / CONTENTS SPBO DB-SET / SOMMAIRE SPBO DB ENSEMBLE / INHALT SPBO DB GESETZT / COMPOSIZIONE DEL SET SPBO DB / COMPOSICIÓN DE SPBO DB CONJUNTO / COMPOSIÇÃO DO CONJUNTO SPBO DB

|   |              | NR.     |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |  |
|---|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
|   |              | 0308739 | 0308741 | 0308742 | 0308750 | 0308751 | 0308752 | 0308753 | 0308754 | 0308755 | 0308757 | 0308758 | 0308759 | 0308760 | 0308767 | 0308768 | 0308771 | 0308773 | 0308775 | 0308776 | 0308777 | 0308778 | 0308779 | 0308780 | 0308782 | 0308784 | 0308789 | 0308792 | 0308793 | 0308896 | 0308910 | 0309042 | 0309055 | 0309086 |  |
| AANTAL ONDERDELEN PER SET / AMOUNT OF PARTS PER SET /<br>NOMBRE DE PIÉCES PAR ENSEMBLE / ANZAHL DER TEILE PRO SET /<br>QUANTITÀ DI PEZZI PER SET / CANTIDAD DE PIEZAS POR JUEGO /<br>QUANTIDADE DE PEÇAS POR JOGO | SPBO 01 1 DB | 1       |         |         | 2       | 1       | 1       |         | 1       | 1       | 1       | 1       |         |         |         | 1       | 1       | 1       | 4       | 1       |         |         | 1       |         | 1       |         | 1       |         | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 02 1 DB | 2       | 1       | 1       | 2       | 1       | 2       | 1       | 1       | 1       | 1       | 1       |         |         | 1       | 1       | 1       | 1       | 6       | 2       |         | 1       | 1       | 1       | 1       |         | 1       |         | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 03 1 DB | 3       | 2       | 2       | 2       | 1       | 3       | 2       | 1       | 1       | 1       | 1       |         |         | 2       | 1       | 1       | 1       | 8       | 3       |         | 2       | 1       | 2       | 1       | 1       | 1       | 2       | 1       | 1       |         | 1       |         | 1       |  |
|   | SPBO 04 1 DB | 4       | 3       | 3       | 2       | 1       | 4       | 3       | 1       | 1       | 1       | 1       |         |         | 3       | 1       | 1       | 1       | 10      | 4       |         | 3       | 1       | 3       | 1       | 1       | 2       | 1       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 05 1 DB | 5       | 4       | 4       | 2       | 1       | 5       | 4       | 1       | 1       | 1       | 1       |         |         | 4       | 1       | 1       | 1       | 12      | 5       |         | 4       | 1       | 4       | 1       | 2       | 3       | 2       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 06 1 DB | 6       | 5       | 5       | 2       | 1       | 6       | 5       | 1       | 1       | 1       | 1       |         |         | 5       | 1       | 1       | 1       | 14      | 6       |         | 5       | 1       | 5       | 1       | 2       | 3       | 2       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 07 1 DB | 7       | 6       | 6       | 2       | 1       | 7       | 6       | 1       | 1       | 1       | 1       |         |         | 6       | 1       | 1       | 1       | 16      | 7       |         | 6       | 1       | 6       | 1       | 3       | 4       | 3       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 08 1 DB | 8       | 7       | 7       | 2       | 1       | 8       | 7       | 1       | 1       | 1       | 1       |         |         | 7       | 1       | 1       | 1       | 18      | 8       |         | 7       | 1       | 7       | 1       | 3       | 4       | 3       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 09 1 DB | 9       | 8       | 8       | 2       | 1       | 9       | 8       | 1       | 1       | 1       | 1       |         |         | 8       | 1       | 1       | 1       | 20      | 9       |         | 8       | 1       | 8       | 1       | 4       | 5       | 4       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 10 1 DB | 10      | 9       | 9       | 2       | 1       | 10      | 9       | 1       | 1       | 1       | 1       |         |         | 9       | 1       | 1       | 1       | 22      | 10      |         | 9       | 1       | 9       | 1       | 4       | 5       | 4       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 11 1 DB | 11      | 10      | 10      | 2       | 1       | 11      | 10      | 1       | 1       | 1       | 1       |         |         | 10      | 1       | 1       | 1       | 24      | 11      |         | 10      | 1       | 10      | 1       | 5       | 6       | 5       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 12 1 DB | 12      | 11      | 11      | 2       | 1       | 12      | 11      | 1       | 1       | 1       | 1       |         |         | 11      | 1       | 1       | 1       | 26      | 12      |         | 11      | 1       | 11      | 1       | 5       | 6       | 5       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 13 1 DB | 13      | 12      | 12      | 2       | 1       | 13      | 12      | 1       | 1       | 1       | 1       |         |         | 12      | 1       | 1       | 1       | 28      | 13      |         | 12      | 1       | 12      | 1       | 6       | 7       | 6       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 14 1 DB | 14      | 13      | 13      | 2       | 1       | 14      | 13      | 1       | 1       | 1       | 1       |         |         | 13      | 1       | 1       | 1       | 30      | 14      |         | 13      | 1       | 13      | 1       | 6       | 7       | 6       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 15 1 DB | 15      | 14      | 14      | 2       | 1       | 15      | 14      | 1       | 1       | 1       | 1       |         |         | 14      | 1       | 1       | 1       | 32      | 15      |         | 14      | 1       | 14      | 1       | 7       | 8       | 7       | 1       |         | 1       |         | 1       |         |  |
|   | SPBO 06 2 DB | 6       | 2       | 2       | 2       | 2       | 3       | 4       | 1       | 1       | 1       | 1       | 1       | 1       | 4       | 2       | 1       | 1       | 16      | 3       | 3       | 4       | 2       | 4       | 1       | 2       | 3       | 2       | 3       | 2       | 1       | 1       | 1       | 4       |  |
|   | SPBO 08 2 DB | 8       | 3       | 3       | 2       | 2       | 4       | 6       | 1       | 1       | 1       | 1       | 1       | 1       | 6       | 2       | 1       | 1       | 20      | 4       | 4       | 6       | 2       | 6       | 1       | 3       | 4       | 3       | 3       | 2       | 1       | 1       | 1       | 6       |  |
|   | SPBO 10 2 DB | 10      | 4       | 4       | 2       | 2       | 5       | 8       | 1       | 1       | 1       | 1       | 1       | 1       | 8       | 2       | 1       | 1       | 24      | 5       | 5       | 8       | 2       | 8       | 1       | 4       | 5       | 4       | 3       | 2       | 1       | 1       | 1       | 8       |  |
|   | SPBO 12 2 DB | 12      | 5       | 5       | 2       | 2       | 6       | 10      | 1       | 1       | 1       | 1       | 1       | 1       | 10      | 2       | 1       | 1       | 28      | 6       | 6       | 10      | 2       | 10      | 1       | 5       | 6       | 5       | 3       | 2       | 1       | 1       | 1       | 10      |  |
| SPBO 14 2 DB  | 14           | 6       | 6       | 2       | 2       | 7       | 12      | 1       | 1       | 1       | 1       | 1       | 1       | 12      | 2       | 1       | 1       | 32      | 7       | 7       | 12      | 2       | 12      | 1       | 6       | 7       | 6       | 3       | 2       | 1       | 1       | 1       | 12      |         |  |

SAMENSTELLING VAN DE SPBI DB-SET / CONTENTS SPBI DB-SET / SOMMAIRE SPBI DB ENSEMBLE / INHALT SPBI DB GESETZT / COMPOSIZIONE DEL SET SPBI DB / COMPOSICIÓN DE SPBI DB CONJUNTO / COMPOSIÇÃO DO CONJUNTO SPBI DB

|   |              | NR.     |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |   |
|---|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|
|   |              | 0308739 | 0308749 | 0308753 | 0308754 | 0308756 | 0308757 | 0308758 | 0308759 | 0308760 | 0308766 | 0308771 | 0308772 | 0308773 | 0308774 | 0308782 | 0308784 | 0308790 | 0308792 | 0308793 | 0308896 | 0308910 | 0309036 | 0309037 | 0309038 | 0309039 | 0309040 | 0309041 | 0309042 | 0309055 | 0309086 |   |
| AANTAL ONDERDELEN PER SET / AMOUNT OF PARTS PER SET /<br>NOMBRE DE PIÉCES PAR ENSEMBLE / ANZAHL DER TEILE PRO SET /<br>QUANTITÀ DI PEZZI PER SET / CANTIDAD DE PIEZAS POR JUEGO /<br>QUANTIDADE DE PEÇAS POR JOGO | SPBI 01 1 DB | 1       |         |         | 1       | 1       | 1       | 1       |         |         | 2       | 1       | 1       | 1       | 3       | 1       |         | 1       |         | 1       |         | 1       | 1       |         |         |         |         |         |         | 1       |         |   |
|   | SPBI 02 1 DB | 2       |         | 1       | 1       | 1       | 1       | 1       |         |         | 3       | 1       | 2       | 1       | 6       | 1       |         | 1       |         | 1       |         | 1       |         | 1       |         |         |         |         |         | 1       |         |   |
|   | SPBI 03 1 DB | 3       |         | 2       | 1       | 1       | 1       | 1       |         |         | 4       | 1       | 3       | 1       | 9       | 1       | 1       | 2       | 1       | 1       |         | 1       |         |         | 1       |         |         |         |         | 1       |         |   |
|   | SPBI 04 1 DB | 4       |         | 3       | 1       | 1       | 1       | 1       |         |         | 5       | 1       | 4       | 1       | 12      | 1       | 1       | 2       | 1       | 1       |         | 1       |         |         |         | 1       |         |         |         | 1       |         |   |
|   | SPBI 05 1 DB | 5       |         | 4       | 1       | 1       | 1       | 1       |         |         | 6       | 1       | 5       | 1       | 15      | 1       | 2       | 3       | 2       | 1       |         | 1       |         |         |         |         | 1       |         |         | 1       |         |   |
|   | SPBI 06 1 DB | 6       |         | 5       | 1       | 1       | 1       | 1       |         |         | 7       | 1       | 6       | 1       | 18      | 1       | 2       | 3       | 2       | 1       |         | 1       |         | 1       |         |         |         | 1       |         | 1       |         |   |
|   | SPBI 07 1 DB | 7       |         | 6       | 1       | 1       | 1       | 1       |         |         | 8       | 1       | 7       | 1       | 21      | 1       | 3       | 4       | 3       | 1       |         | 1       |         |         | 1       |         |         |         | 1       |         | 1       |   |
|   | SPBI 08 1 DB | 8       |         | 7       | 1       | 1       | 1       | 1       |         |         | 9       | 1       | 8       | 1       | 24      | 1       | 3       | 4       | 3       | 1       |         | 1       |         |         |         | 1       |         |         | 1       |         | 1       |   |
|   | SPBI 09 1 DB | 9       |         | 8       | 1       | 1       | 1       | 1       |         |         | 10      | 1       | 9       | 1       | 27      | 1       | 4       | 5       | 4       | 1       |         | 1       |         |         |         |         |         | 1       | 1       |         | 1       |   |
|   | SPBI 10 1 DB | 10      |         | 9       | 1       | 1       | 1       | 1       |         |         | 11      | 1       | 10      | 1       | 30      | 1       | 4       | 5       | 4       | 1       |         | 1       |         | 1       |         |         |         |         | 2       |         | 1       |   |
|   | SPBI 11 1 DB | 11      |         | 10      | 1       | 1       | 1       | 1       |         |         | 12      | 1       | 11      | 1       | 33      | 1       | 5       | 6       | 5       | 1       |         | 1       |         |         | 1       |         |         |         | 2       |         | 1       |   |
|   | SPBI 12 1 DB | 12      |         | 11      | 1       | 1       | 1       | 1       |         |         | 13      | 1       | 12      | 1       | 36      | 1       | 5       | 6       | 5       | 1       |         | 1       |         |         |         | 1       |         |         | 2       |         | 1       |   |
|   | SPBI 13 1 DB | 13      |         | 12      | 1       | 1       | 1       | 1       |         |         | 14      | 1       | 13      | 1       | 39      | 1       | 6       | 7       | 6       | 1       |         | 1       |         |         |         |         | 1       | 2       |         | 1       |         |   |
|   | SPBI 14 1 DB | 14      |         | 13      | 1       | 1       | 1       | 1       |         |         | 15      | 1       | 14      | 1       | 42      | 1       | 6       | 7       | 6       | 1       |         | 1       |         | 1       |         |         |         |         | 3       |         | 1       |   |
|   | SPBI 15 1 DB | 15      |         | 14      | 1       | 1       | 1       | 1       |         |         | 16      | 1       | 15      | 1       | 45      | 1       | 7       | 8       | 7       | 1       |         | 1       |         |         | 1       |         |         |         | 3       |         | 1       |   |
|   | SPBI 06 2 DB | 6       | 1       | 4       |         | 1       | 1       |         | 1       | 1       | 8       | 1       | 3       | 1       | 9       | 1       | 2       | 3       | 2       | 3       | 2       | 1       |         |         | 1       |         |         |         |         | 1       | 1       | 4 |
|   | SPBI 08 2 DB | 8       | 1       | 6       |         | 1       | 1       |         | 1       | 1       | 10      | 1       | 4       | 1       | 12      | 1       | 3       | 4       | 3       | 3       | 2       | 1       |         |         |         | 1       |         |         |         | 1       | 1       | 6 |
|   | SPBI 10 2 DB | 10      | 1       | 8       |         | 1       | 1       |         | 1       | 1       | 12      | 1       | 5       | 1       | 15      | 1       | 4       | 5       | 4       | 3       | 2       | 1       |         |         |         |         |         | 1       |         | 1       | 1       | 8 |
| SPBI 12 2 DB  | 12           | 1       | 10      |         | 1       | 1       |         | 1       | 1       | 14      | 1       | 6       | 1       | 18      | 1       | 5       | 6       | 5       | 3       | 2       | 1       |         | 1       |         |         |         |         | 1       | 1       | 1       | 10      |   |
| SPBI 14 2 DB  | 14           | 1       | 12      |         | 1       | 1       |         | 1       | 1       | 16      | 1       | 7       | 1       | 21      | 1       | 6       | 7       | 6       | 3       | 2       | 1       |         |         | 1       |         |         |         | 1       | 1       | 1       | 12      |   |

**SAMENSTELLING VAN DE SPFR F20/30-SET / CONTENTS SPFR F20/30-SET / SOMMAIRE SPFR F20/30 ENSEMBLE / INHALT SPFR F20/30 GESETZT /  
COMPOSIZIONE DEL SET SPFR F20/30 / COMPOSICIÓN DE SPFR F20/30 CONJUNTO / COMPOSIÇÃO DO CONJUNTO SPFR F20/30**

|  |                | NR.     |         |         |         |         |         |         |         |         |         |         |         |         |
|--|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|  |                | 0308470 | 0308753 | 0308754 | 0308755 | 0308757 | 0308758 | 0308761 | 0308763 | 0308765 | 0308769 | 0308770 | 0308771 | 0308773 |
| <b>AANTAL ONDERDELEN PER SET / AMOUNT OF PARTS<br/>PER SET / NOMBRE DE PIÈCES PAR ENSEMBLE / ANZAH<br/>DER TEILE PRO SET / QUANTITÀ DI PEZZI PER SET /<br/>CANTIDAD DE PIEZAS POR JUEGO / QUANTIDADE<br/>DE PEÇAS POR JOGO</b> | SPFR 01 F20/30 | 1       |         | 1       | 1       | 1       | 1       | 2       | 2       | 2       |         | 1       | 1       | 1       |
|  | SPFR 02 F20/30 | 2       | 1       | 1       | 1       | 1       | 1       | 3       | 3       | 3       | 1       | 1       | 1       | 1       |
|  | SPFR 03 F20/30 | 3       | 2       | 1       | 1       | 1       | 1       | 4       | 4       | 4       | 2       | 1       | 1       | 1       |
|  | SPFR 04 F20/30 | 4       | 3       | 1       | 1       | 1       | 1       | 5       | 5       | 5       | 3       | 1       | 1       | 1       |
|  | SPFR 05 F20/30 | 5       | 4       | 1       | 1       | 1       | 1       | 6       | 6       | 6       | 4       | 1       | 1       | 1       |
|  | SPFR 06 F20/30 | 6       | 5       | 1       | 1       | 1       | 1       | 7       | 7       | 7       | 5       | 1       | 1       | 1       |
|  | SPFR 07 F20/30 | 7       | 6       | 1       | 1       | 1       | 1       | 8       | 8       | 8       | 6       | 1       | 1       | 1       |
|  | SPFR 08 F20/30 | 8       | 7       | 1       | 1       | 1       | 1       | 9       | 9       | 9       | 7       | 1       | 1       | 1       |
|  | SPFR 09 F20/30 | 9       | 8       | 1       | 1       | 1       | 1       | 10      | 10      | 10      | 8       | 1       | 1       | 1       |
|  | SPFR 10 F20/30 | 10      | 9       | 1       | 1       | 1       | 1       | 11      | 11      | 11      | 9       | 1       | 1       | 1       |
|  | SPFR 11 F20/30 | 11      | 10      | 1       | 1       | 1       | 1       | 12      | 12      | 12      | 10      | 1       | 1       | 1       |
|  | SPFR 12 F20/30 | 12      | 11      | 1       | 1       | 1       | 1       | 13      | 13      | 13      | 11      | 1       | 1       | 1       |
|  | SPFR 13 F20/30 | 13      | 12      | 1       | 1       | 1       | 1       | 14      | 14      | 14      | 12      | 1       | 1       | 1       |
|  | SPFR 14 F20/30 | 14      | 13      | 1       | 1       | 1       | 1       | 15      | 15      | 15      | 13      | 1       | 1       | 1       |
|  | SPFR 15 F20/30 | 15      | 14      | 1       | 1       | 1       | 1       | 16      | 16      | 16      | 14      | 1       | 1       | 1       |

**SAMENSTELLING VAN DE SPFR F45/60-SET / CONTENTS SPFR F45/60-SET / SOMMAIRE SPFR F45/60 ENSEMBLE / INHALT SPFR F45/60 GESETZT /  
COMPOSIZIONE DEL SET SPFR F45/60 / COMPOSICIÓN DE SPFR F45/60 CONJUNTO / COMPOSIÇÃO DO CONJUNTO SPFR F45/60**

|   | NR.            |         |         |         |         |         |         |         |         |         |         |         |         |
|---|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|   | 0308470        | 0308753 | 0308754 | 0308755 | 0308757 | 0308758 | 0308761 | 0308764 | 0308765 | 0308769 | 0308770 | 0308771 | 0308773 |
| AANTAL ONDERDELEN PER SET / AMOUNT OF PARTS<br>PER SET / NOMBRE DE PIÈCES PAR ENSEMBLE / ANZAH<br>DER TEILE PRO SET / QUANTITÀ DI PEZZI PER SET /<br>CANTIDAD DE PIEZAS POR JUEGO / QUANTIDADE<br>DE PEÇAS POR JOGO | SPFR 01 F45/60 | 1       | 1       | 1       | 1       | 1       | 2       | 2       | 2       | 1       | 1       | 1       | 1       |
|   | SPFR 02 F45/60 | 2       | 1       | 1       | 1       | 1       | 3       | 3       | 3       | 1       | 1       | 1       | 1       |
|   | SPFR 03 F45/60 | 3       | 2       | 1       | 1       | 1       | 4       | 4       | 4       | 2       | 1       | 1       | 1       |
|   | SPFR 04 F45/60 | 4       | 3       | 1       | 1       | 1       | 5       | 5       | 5       | 3       | 1       | 1       | 1       |
|   | SPFR 05 F45/60 | 5       | 4       | 1       | 1       | 1       | 6       | 6       | 6       | 4       | 1       | 1       | 1       |
|   | SPFR 06 F45/60 | 6       | 5       | 1       | 1       | 1       | 7       | 7       | 7       | 5       | 1       | 1       | 1       |
|   | SPFR 07 F45/60 | 7       | 6       | 1       | 1       | 1       | 8       | 8       | 8       | 6       | 1       | 1       | 1       |
|   | SPFR 08 F45/60 | 8       | 7       | 1       | 1       | 1       | 9       | 9       | 9       | 7       | 1       | 1       | 1       |
|   | SPFR 09 F45/60 | 9       | 8       | 1       | 1       | 1       | 10      | 10      | 10      | 8       | 1       | 1       | 1       |
|   | SPFR 10 F45/60 | 10      | 9       | 1       | 1       | 1       | 11      | 11      | 11      | 9       | 1       | 1       | 1       |
|   | SPFR 11 F45/60 | 11      | 10      | 1       | 1       | 1       | 12      | 12      | 12      | 10      | 1       | 1       | 1       |
|   | SPFR 12 F45/60 | 12      | 11      | 1       | 1       | 1       | 13      | 13      | 13      | 11      | 1       | 1       | 1       |
|   | SPFR 13 F45/60 | 13      | 12      | 1       | 1       | 1       | 14      | 14      | 14      | 12      | 1       | 1       | 1       |
|   | SPFR 14 F45/60 | 14      | 13      | 1       | 1       | 1       | 15      | 15      | 15      | 13      | 1       | 1       | 1       |
|   | SPFR 15 F45/60 | 15      | 14      | 1       | 1       | 1       | 16      | 16      | 16      | 14      | 1       | 1       | 1       |

**SAMENSTELLING VAN DE SPFR F20/30 DB-SET / CONTENTS SPFR F20/30 DB-SET / SOMMAIRE SPFR F20/30 DB ENSEMBLE / INHALT SPFR F20/30 DB GESETZT / COMPOSIZIONE DEL SET SPFR F20/30 DB / COMPOSICIÓN DE SPFR F20/30 DB CONJUNTO / COMPOSIÇÃO DO CONJUNTO SPFR F20/30 DB**

|  |                   | NR.     |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
|--|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|  |                   | 0308470 | 0308753 | 0308754 | 0308755 | 0308757 | 0308758 | 0308761 | 0308763 | 0308765 | 0308769 | 0308770 | 0308771 | 0308773 | 0308786 | 0308788 | 0308791 | 0308792 | 0308794 | 0308910 | 0309055 |
| <b>AANTAL ONDERDELEN PER SET / AMOUNT OF PARTS<br/>PER SET / NOMBRE DE PIÈCES PAR ENSEMBLE / ANZAH<br/>DER TEILE PRO SET / QUANTITÀ DI PEZZI PER SET /<br/>CANTIDAD DE PIEZAS POR JUEGO / QUANTIDADE<br/>DE PEÇAS POR JOGO</b> | SPFR 01 F20/30 DB | 1       |         | 1       | 1       | 1       | 1       | 2       | 2       | 2       |         | 1       | 1       | 1       | 1       |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 02 F20/30 DB | 2       | 1       | 1       | 1       | 1       | 1       | 3       | 3       | 3       | 1       | 1       | 1       | 1       | 1       |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 03 F20/30 DB | 3       | 2       | 1       | 1       | 1       | 1       | 4       | 4       | 4       | 2       | 1       | 1       | 1       | 1       |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 04 F20/30 DB | 4       | 3       | 1       | 1       | 1       | 1       | 5       | 5       | 5       | 3       | 1       | 1       | 1       | 1       |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 05 F20/30 DB | 5       | 4       | 1       | 1       | 1       | 1       | 6       | 6       | 6       | 4       | 1       | 1       | 1       | 1       |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 06 F20/30 DB | 6       | 5       | 1       | 1       | 1       | 1       | 7       | 7       | 7       | 5       | 1       | 1       | 1       | 1       | 1       | 2       | 1       | 1       | 1       | 1       |
|  | SPFR 07 F20/30 DB | 7       | 6       | 1       | 1       | 1       | 1       | 8       | 8       | 8       | 6       | 1       | 1       | 1       | 1       | 1       | 2       | 1       | 1       | 1       | 1       |
|  | SPFR 08 F20/30 DB | 8       | 7       | 1       | 1       | 1       | 1       | 9       | 9       | 9       | 7       | 1       | 1       | 1       | 1       | 1       | 2       | 1       | 1       | 1       | 1       |
|  | SPFR 09 F20/30 DB | 9       | 8       | 1       | 1       | 1       | 1       | 10      | 10      | 10      | 8       | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 10 F20/30 DB | 10      | 9       | 1       | 1       | 1       | 1       | 11      | 11      | 11      | 9       | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 11 F20/30 DB | 11      | 10      | 1       | 1       | 1       | 1       | 12      | 12      | 12      | 10      | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 12 F20/30 DB | 12      | 11      | 1       | 1       | 1       | 1       | 13      | 13      | 13      | 11      | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 13 F20/30 DB | 13      | 12      | 1       | 1       | 1       | 1       | 14      | 14      | 14      | 12      | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 14 F20/30 DB | 14      | 13      | 1       | 1       | 1       | 1       | 15      | 15      | 15      | 13      | 1       | 1       | 1       | 1       | 3       | 4       | 3       | 1       | 1       | 1       |
|  | SPFR 15 F20/30 DB | 15      | 14      | 1       | 1       | 1       | 1       | 16      | 16      | 16      | 14      | 1       | 1       | 1       | 1       | 3       | 4       | 3       | 1       | 1       | 1       |

**SAMENSTELLING VAN DE SPFR F45/60 DB-SET / CONTENTS SPFR F45/60 DB-SET / SOMMAIRE SPFR F45/60 DB ENSEMBLE / INHALT SPFR F45/60 DB GESETZT / COMPOSIZIONE DEL SET SPFR F45/60 DB / COMPOSICIÓN DE SPFR F45/60 DB CONJUNTO / COMPOSIÇÃO DO CONJUNTO SPFR F45/60 DB**

|  |                   | NR.     |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
|--|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|  |                   | 0308470 | 0308753 | 0308754 | 0308755 | 0308757 | 0308758 | 0308761 | 0308764 | 0308765 | 0308769 | 0308770 | 0308771 | 0308773 | 0308786 | 0308788 | 0308791 | 0308792 | 0308794 | 0308910 | 0309055 |
| <b>AANTAL ONDERDELEN PER SET / AMOUNT OF PARTS<br/>                     PER SET / NOMBRE DE PIÈCES PAR ENSEMBLE / ANZAH<br/>                     DER TEILE PRO SET / QUANTITÀ DI PEZZI PER SET /<br/>                     CANTIDAD DE PIEZAS POR JUEGO / QUANTIDADE<br/>                     DE PEÇAS POR JOGO</b> | SPFR 01 F45/60 DB | 1       |         | 1       | 1       | 1       | 1       | 2       | 2       | 2       |         | 1       | 1       | 1       | 1       |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 02 F45/60 DB | 2       | 1       | 1       | 1       | 1       | 1       | 3       | 3       | 3       | 1       | 1       | 1       | 1       |         |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 03 F45/60 DB | 3       | 2       | 1       | 1       | 1       | 1       | 4       | 4       | 4       | 2       | 1       | 1       | 1       | 1       |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 04 F45/60 DB | 4       | 3       | 1       | 1       | 1       | 1       | 5       | 5       | 5       | 3       | 1       | 1       | 1       | 1       |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 05 F45/60 DB | 5       | 4       | 1       | 1       | 1       | 1       | 6       | 6       | 6       | 4       | 1       | 1       | 1       | 1       |         | 1       |         | 1       | 1       | 1       |
|  | SPFR 06 F45/60 DB | 6       | 5       | 1       | 1       | 1       | 1       | 7       | 7       | 7       | 5       | 1       | 1       | 1       | 1       | 1       | 2       | 1       | 1       | 1       | 1       |
|  | SPFR 07 F45/60 DB | 7       | 6       | 1       | 1       | 1       | 1       | 8       | 8       | 8       | 6       | 1       | 1       | 1       | 1       | 1       | 2       | 1       | 1       | 1       | 1       |
|  | SPFR 08 F45/60 DB | 8       | 7       | 1       | 1       | 1       | 1       | 9       | 9       | 9       | 7       | 1       | 1       | 1       | 1       | 1       | 2       | 1       | 1       | 1       | 1       |
|  | SPFR 09 F45/60 DB | 9       | 8       | 1       | 1       | 1       | 1       | 10      | 10      | 10      | 8       | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 10 F45/60 DB | 10      | 9       | 1       | 1       | 1       | 1       | 11      | 11      | 11      | 9       | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 11 F45/60 DB | 11      | 10      | 1       | 1       | 1       | 1       | 12      | 12      | 12      | 10      | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 12 F45/60 DB | 12      | 11      | 1       | 1       | 1       | 1       | 13      | 13      | 13      | 11      | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 13 F45/60 DB | 13      | 12      | 1       | 1       | 1       | 1       | 14      | 14      | 14      | 12      | 1       | 1       | 1       | 1       | 2       | 3       | 2       | 1       | 1       | 1       |
|  | SPFR 14 F45/60 DB | 14      | 13      | 1       | 1       | 1       | 1       | 15      | 15      | 15      | 13      | 1       | 1       | 1       | 1       | 3       | 4       | 3       | 1       | 1       | 1       |
|  | SPFR 15 F45/60 DB | 15      | 14      | 1       | 1       | 1       | 1       | 16      | 16      | 16      | 14      | 1       | 1       | 1       | 1       | 3       | 4       | 3       | 1       | 1       | 1       |

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